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UNIVERSITY OF SOUTHAMPTON

FACULTY OF ENVIRONMENTAL AND LIFE SCIENCES

School of Health Sciences

The Feasibility of Motivational Interviewing as an Adjunct to Pulmonary Rehabilitation to Promote Engagement and Adherence to Physical Activity Recommendations

Robert Shannon

Doctor of Philosophy

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UNIVERSITY OF SOUTHAMPTON

ABSTRACT

FACULTY OF ENVIRONMENTAL AND LIFE SCIENCES

School of Health Sciences

Doctor of Philosophy

THE FEASIBILITY OF MOTIVATIONAL INTERVIEWING AS AN ADJUNCT TO PULMONARY REHABILITATION TO PROMOTE ENGAGEMENT AND ADHERENCE TO PHYSICAL ACTIVITY RECOMMENDATIONS

Robert John Shannon

Aim: To explore the feasibility of motivational interviewing (MI) as an adjunct to pulmonary rehabilitation (PR). **Method:** A mixed methods research design was used, involving three linked studies, guided by the Medical Research Council complex intervention framework. Study 1: following a 1-day introductory workshop, respiratory clinicians' (n=9) views of MI were gathered, and their insights informed a model for combining MI with PR, and a MI training package. Study 2 employed a pre-post, single group quantitative design to evaluate the effectiveness of the MI training package (2-day workshop and five coaching/feedback sessions) for PR clinicians (n=24). The learning and implementation experiences of a sample of these participants (n=9) were explored in study 3. **Results:** Study 1: Respiratory clinicians deemed MI acceptable for maximising PR engagement and adherence but raised feasibility issues regarding training and implementation. Study 2: PR clinicians made progressive improvements in MI skill at each stage of training, with mean values for MI spirit (3.5 ±0.61) and mean global ratings of skill (3.57±0.63) reaching basic competency targets (3.5). The relative frequency and depth of reflective listening did not alter sufficiently (reflection question ratio 0.71 ±0.40, target 1; percent complex reflections 24.25 ±13.54, target 40) and participants struggled to achieve the depth of conversation advocated in the PREAMP intervention manual developed for the study. Participants took longer than expected to complete training (total training time 20.55 weeks ±9.78, target 10 weeks) and n=12 (50%) did not complete training. Study 3 highlighted three themes. Within these are some possible explanations for the failure to achieve desired levels of reflective listening, depth of conversation and timely completion of training within study 2: 1) Cultural context: service/organisational issues result in prioritisation of short-term measures of impact, which compromise the time available for MI. A disconnect exists between an MI style of working and the approach that PR clinicians are used to and feel comfortable with; 2) Challenging: the prospect of using novel skills led to performance anxiety. Using MI required participants to accept that sessions may take longer, cover unanticipated topics and may not result in change. Concerns were raised that not all patients are immediately ready to take a more active role in consultations and decision making. Trying novel skills and suppressing behaviours that are antithetical to MI demanded attentional resource and detracted from key tasks such as maintaining empathy. Participants found recognising the limitations of existing practice, yet feeling underprepared to deliver MI effectively, to be destabilising. MI may reveal emotive issues that are uncomfortable for both patients and clinicians. However, all participants noted improvements in their skills and confidence over time, which reinforced positive perceptions of MI; 3) Lessons learnt for the future: training was well received but greater volume of training, protected time for learning and extended appointments to support the integration of MI in practice were deemed important. **Conclusion:** MI maybe a feasible adjunct to PR. It can be delivered by health professionals, but there are some training issues that need to be addressed to ensure competence. The next stage in the MRC framework should be a pilot randomised controlled trial, but the author recommends use of a stepwise training model whereby training continues until basic competency is achieved, and that additional appointment time is provided to allow for the integration of MI.

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DECLARATION OF AUTHORSHIP

I, Robert John Shannon

declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

The Feasibility of Motivational Interviewing used as an adjunct to Pulmonary Rehabilitation to Promote Engagement and Adherence to Physical Activity Recommendations

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. Parts of this work have been published as:

Shannon R, Bruton A and Donovan-Hall M (2015) Learning motivational interviewing (MI) for use in pulmonary rehabilitation (PR). Paper presented at European Respiratory Society International Congress Amsterdam

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Signed: .....

Date: .....

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Definitions and abbreviations

Adherence to physical activity recommendations: The extent to which a patient engages in physical activity that is recommended to them at home or in the community after the pulmonary rehabilitation programme has ended.

Engagement with pulmonary rehabilitation: The extent to which a patient who has enrolled onto a programme, attends for scheduled sessions, completes recommended quantity and quality of exercise during the programme and maintains recommended levels of physical activity between sessions.

Motivational interviewing in its *pristine* form: A method that includes all elements that have been empirically or theoretically linked to the efficacy of motivational interviewing and avoids practices that carry potential to undermine its effectiveness. Based on quality criteria described by Miller and Rollnick (2014), it contains:

1. A person-centred non authoritarian counselling style as originally described by Carl Rogers and his students;

2. A clearly identified change goal toward which the conversation is directed; and

3. Differential evoking and strengthening of the person's own motivations for change.

BCT: Behaviour change technique

CCG: Clinical Commissioning Group

COPD: Chronic Obstructive Pulmonary Disease

DPR: Declarative-procedural-reflective model

FEV_1: Forced expiratory volume in one second

GOLD: Global strategy for the diagnosis, management, and prevention of Chronic Obstructive Pulmonary Disease

HRQL: Health related quality of life

MI: Motivational interviewing

MINT: The Motivational Interviewing Network of Trainers

MISC: Motivational Interviewing Skill Code

MITI: Motivational Interviewing Treatment Integrity coding system

MRC: Medical Research Council

NHS: National Health Service

OARS: Acronym for four basic client-centred communication skills: open-ended question affirmation, reflection, and summary

PR: Pulmonary rehabilitation

RCT: Randomised controlled trial

SDT: Self-determination theory

Chapter 1: Thesis introduction

1.1 Introduction

This chapter provides a background and rationale for the programme of research and a description of the structure and content of the thesis.

1.2 Thesis background and rationale

COPD is a debilitating respiratory disease that affects both physical and mental wellbeing (GOLD 2020). Symptoms such as dyspnoea and peripheral muscle weakness result in exercise intolerance, which can make physical activity[1] particularly challenging. Psychological problems such as anxiety and depression are common features of COPD that compound the problem and often lead to activity avoidance (Troosters et al. 2013). Inactivity leads to further deconditioning and can result in a cycle of declining physical activity, reduced exercise tolerance, increased COPD symptoms during exercise and an overall deterioration in health (Polkey and Moxham 2011; GOLD 2020).

PR for patients with COPD is designed to break the cycle of increasing symptoms and reduced physical activity and is recommended as best practice in clinical guidelines (Bolton et al. 2013). PR is an individually tailored, multidisciplinary programme involving education, exercise and support. To be maximally effective, patients are required to adhere to the exercise component and sustain their activity levels after the programme has ended (Bolton et al. 2013; Spruit et al. 2013b; GOLD 2020). This requires considerable effort and motivation and the barriers to change for patients with COPD such as coping with dyspnoea and fatigue and managing depression and anxiety make sustained behaviour change particularly challenging (Bourbeau and Bartlett 2008; Keating et al. 2011a; Thorpe et al. 2012; Di Marco et al. 2013; Hayton et al. 2013; Troosters et al. 2013; Gimeno-Santos et al. 2014).

[1] Physical activity refers to "any bodily movement produced by skeletal muscles that results in energy expenditure." (Caspersen et. al. 1985 p. 126) and includes leisure time, domestic and occupational activities. The terms physical activity and exercise are often used interchangeably, and whilst they are both related to clinical outcomes in COPD, they are not the same. Exercise such as those activities completed during PR, "is a subset of physical activity that is planned, structured, and repetitive and has a final or immediate objective the improvement or maintenance of physical fitness" (Caspersen et al. 1985 p. 126). The term physical inactivity is generally used to describe a level of physical activity that is below recommended levels (World Health Organisation 2010). In instances within this thesis where both physical activity and exercise are relevant, the broader term physical activity will be used.

Whilst PR has been shown to lead to short-term improvements in health related quality of life and exercise tolerance (McCarthy et al. 2015), not all patients complete the programme (Steiner et al. 2016) and the benefits are known to decline markedly at 6-18 months follow-up (Griffiths et al. 2000; Bestall et al. 2003; Ries et al. 2003; Ries et al. 2007). According to the American Thoracic Society (ATS) and European Respiratory Society (ERS), the main reason for the decay in benefit is poor adherence to physical activity recommendations (Spruit et al. 2013b). Physical activity levels following PR are variable with many studies showing no increase from pre-rehabilitation levels at 3-weeks or 6-12 weeks post PR (Mador et al. 2011; Cindy Ng et al. 2012; Egan et al. 2012; Saunders et al. 2015; Mesquita et al. 2017). Moreover, long-term adherence to physical activity recommendations (12-months post PR) is poor (Egan et al. 2012; Dyer et al. 2013), even when patients attend for maintenance programmes involving group exercise once rehabilitation has ended (Beauchamp et al. 2013).

PR guidelines emphasise the need to provide support that will motivate patients to make sustained changes in daily physical activity in addition to enhancing exercise tolerance (Bolton et al. 2013; Spruit et al. 2013b). Little is known, however, about how best to intervene with patients who have COPD to motivate them to become more active (Vaes et al. 2013; Wilson et al. 2015b; Lahham et al. 2016; Mantoani et al. 2016; Williams et al. 2017). Although PR typically has an educational component aimed at developing the knowledge, skills and confidence to help patients self-manage their condition, the evidence that this is sufficient to increase physical activity is lacking (Janelli et al. 1991; Blackstock et al. 2014). Identifying ways to extend and prolong the beneficial effects of PR has been identified as a key research question (Celli et al. 2015) and studies of interventions to encourage uptake and adherence to PR are now seen as a research priority (Jones et al. 2017).

Motivational interviewing (MI) is a person-centred counselling method designed to build motivation for and commitment to sustained health behaviour change (Miller and Rollnick 2013). There are theoretical reasons to believe that MI might promote engagement[2] and adherence to long-term physical activity recommendations and thereby improve clinical outcomes. To achieve sustained change requires a willingness on the part of those with COPD to tolerate the discomfort and anxiety associated with physical activity and to invest time and effort during and after rehabilitation to make change happen. MI may serve to prepare those with COPD for the rigours of PR by strengthening their underlying motivation and commitment

[2] Engagement in this context refers to attendance for scheduled PR sessions, completion of recommended quantity and quality of exercise during scheduled PR sessions and maintaining recommended levels of physical activity between sessions.

to each of the programme components. It may also help by galvanising motivation for regular physical activity following completion of the programme.

Although there are good theoretical reasons to believe that a combined MI and PR intervention may enhance programme engagement and adherence to long-term physical activity recommendations, prior to any trial to test this theory, it is imperative to determine whether use of MI for this purpose is both feasible and acceptable.[3]

Meta-analyses have shown MI to be an effective method for promoting behaviour change in other contexts (Lundahl et al. 2010; Lundahl et al. 2013; Randall and McNeil 2017; Frost et al. 2018) and there is evidence that it is relatively efficient, in some cases taking less clinician time to achieve change than other established interventions (Project MATCH Research Group 1997; UKATT Research Team 2005a, b). The use of MI as adjunct to other established interventions has empirical support, particularly in alcohol, drug and mental health treatment contexts. Following MI, patients tend to make better use of the intervention it is partnered with; attendance and engagement improve, as do long-term outcomes (Hettema et al. 2005; Westra et al. 2016; Constantino et al. 2017; Lawrence et al. 2017; Randall and McNeil 2017). MI therefore represents a plausible means of enhancing and extending the beneficial effects of PR.

The strongest evidence for MI is in the addictions field where it originated, but it has also diffused into health contexts where there is some evidence of effectiveness (Lundahl et al. 2013; Vanbuskirk and Wetherell 2013; O'Halloran et al. 2014; Purath et al. 2014; Morton et al. 2015; Frost et al. 2018; Soderlund 2018). Several studies have examined the impact of MI on physical activity for patients with COPD (de Blok et al. 2006; Wood-Baker et al. 2012; Kruis et al. 2014; Mitchell et al. 2014; Altenburg et al. 2015; Burtin et al. 2015; Benzo et al. 2016; Holland et al. 2017; Rehman et al. 2017; Horton et al. 2018). Whilst the results are encouraging, these studies are often limited by small sample sizes and inadequate follow-ups. Moreover, they have typically involved adaptations of MI, a common practice when MI is used in health contexts (Resnicow et al. 2002a; Miller and Rollnick 2014). Using modified forms of MI may be time-efficient and reduce training requirements but doing so complicates the interpretation of the results. In such studies, intervention 'failure' may be because what was delivered did not include all elements of MI that are theoretically or empirically linked to its efficacy, or because additional (non-MI) components were included that had a negative effect (Miller and Rollnick 2014).

[3] Feasibility refers to whether the intervention can be delivered as planned, whereas acceptability is concerned with whether recipients and providers view the intervention as appropriate and relevant (Giangregregorio and Thabane 2015). Both constructs are subsumed under the term 'feasibility' within the Medical Research Council framework. In instances within this thesis where both feasibility and acceptability are relevant, the broader term feasibility will be used.

Another limitation in many of these studies is the absence of quality assurance measures. Miller and Rollnick (2014) assert that even when an intervention is described as containing all known 'active ingredients', this does not mean that it was delivered as intended. To represent a legitimate test of behavioural interventions such as MI, it is necessary to ensure providers are trained to a defined level of skill ahead of their involvement. It is also important to report treatment integrity (provider skill and protocol adherence) by recording and coding sessions throughout the trial with a reliable and valid instrument. These quality assurance measures allow stronger conclusions to be drawn and support replication (Bellg et al. 2004; Breckon et al. 2008; Miller and Rollnick 2014).

To summarise, there is evidence for the efficacy of MI across a variety of different settings (and of the importance of the skill with which it is delivered), but not as an adjunct to PR. Although some clinicians report using MI for patients with COPD, the effect of MI in its *pristine* form[4] used as an adjunct to PR to promote engagement and increase adherence to physical activity recommendations has yet to be formally evaluated. The first stage of evaluating this specific application of MI is to examine its feasibility. The focus of the research contained within this thesis, therefore, is the feasibility of MI as an adjunct to PR.

1.3 Overarching research questions

Guidance on the development and evaluation of complex interventions provided by the United Kingdom's Medical Research Council (UK MRC) (Craig et al. 2008) implies that the use of MI as an adjunct to PR constitutes a complex intervention. As such, several phases of research are required prior to formal testing and widespread dissemination, which relate to intervention development, feasibility and pilot testing, evaluation and implementation. The research contained within this thesis is focused primarily on determining whether the use of MI in this novel context is feasible (that is whether MI can be delivered as planned) and acceptable (whether PR clinicians view the addition of MI as appropriate and relevant), although consideration is also given to the development and implementation phases throughout.

The overarching research questions that this programme of research answered are:

1) Do respiratory clinicians believe that MI is feasible and an acceptable adjunct to PR to enhance engagement and adherence to physical activity recommendations?

[4] That is where all the components that have been theoretically or empirically linked to its efficacy are included and no additional elements that are antithetical to the spirit and practice MI have been used, which may have a detrimental effect on outcome (see section 3.7).

2) Is a tailored MI training package for PR clinicians feasible?

3) Does the training package lead to basic competency in MI?

4) What are PR clinicians' experiences of learning MI and using it as an adjunct to PR?

1.4 Researcher background

I am a Chartered Sport and Exercise Psychologist and Lecturer within the School of Health Sciences, University of Southampton. The focus of my teaching is healthcare communication (with an emphasis on encouraging health behaviour change) for allied health professionals and nurses at both pre and post-registration levels. I have delivered training in MI for over 25 years and am a member of the Motivational Interviewing Network of Trainers, an international organisation that aims to promote high quality practice and training. I embarked on the programme of research contained within this thesis, therefore with a sound knowledge and experience of MI, but with potential for bias in favour of its use.

My personal motivation for completing this research was two-fold. The initial idea was conceived during discussions with respiratory physiotherapy colleagues who explained that the effects of PR are undermined by sub-optimal engagement and poor adherence to long-term physical activity recommendations. It seemed to me that there could be a place for MI, particularly in light of the emerging evidence for its use as an adjunct to established interventions. I was therefore keen to explore the feasibility of MI for extending and prolonging the beneficial effects of PR.

I was also particularly interested to see whether physiotherapists and nurses, who are the clinicians primarily responsible for delivering PR in the UK National Health Service (NHS), could learn to provide MI competently. I receive requests regularly to deliver relatively brief (1 or 2-day) workshop-based MI training from NHS organisations. Whilst I have found that this is sufficient to increase learners' confidence and insights to the point that they can try out the skills with patients, I doubted whether it was sufficient to promote basic competency in MI[5] and adherence to the principles in everyday practice. As part of the assessment of feasibility, I was therefore interested in formally assessing the impact of workshop training for clinicians and determining what effect more intensive training input might have.

[5] That is a level of skill that is considered sufficient to make a difference to patient outcomes (see section 4.3.3).

1.5 Thesis structure and content

The structure of the thesis is represented in Figure 1-1.

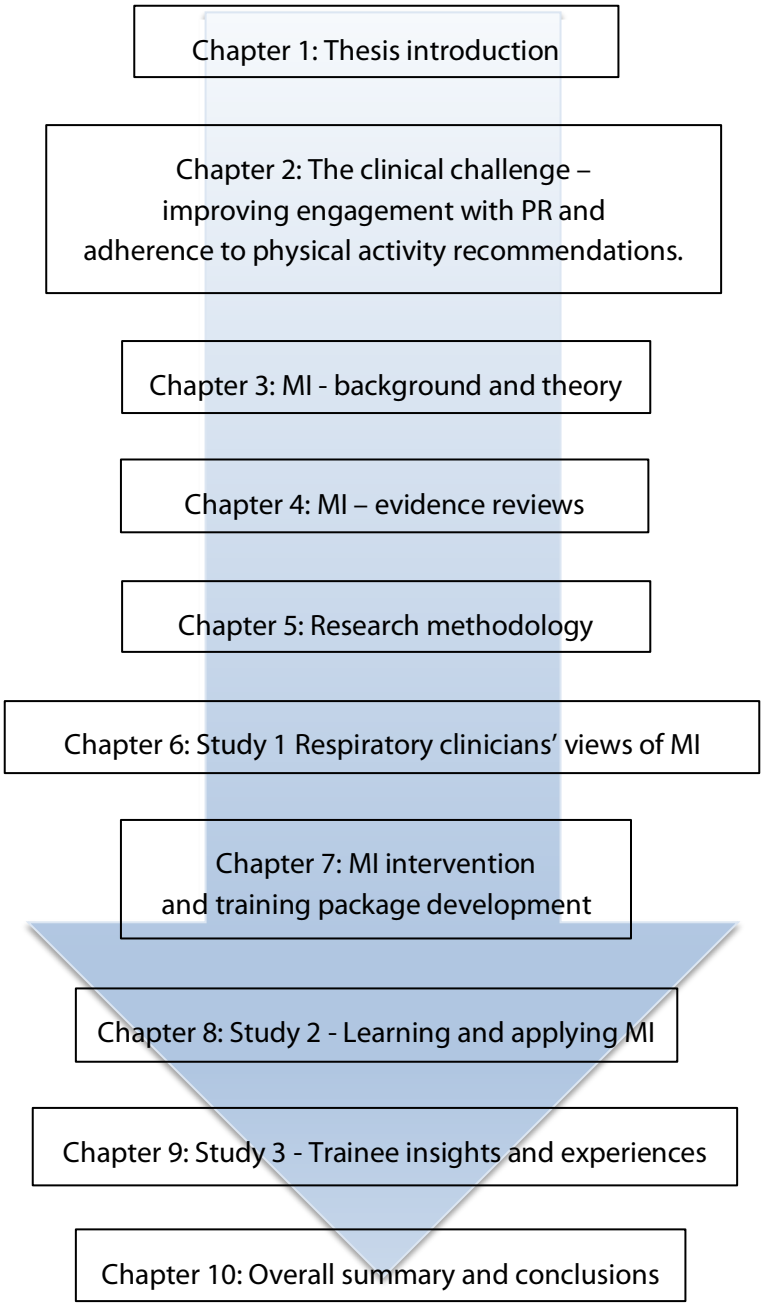


Figure 1-1. Structure of thesis.

Chapter 1: Thesis introduction. This chapter contains an overview of the thesis and the overarching aim of the research that is presented within it.

Chapter 2: The clinical challenge: Improving engagement with PR adherence to physical activity recommendations. The rationale for the research is provided in Chapter 2. It contains a summary of the epidemiology of COPD, a description of the impact of the disease on the person and a quantification of its economic burden. PR is described as a cornerstone of the non-pharmacological management of COPD, but the long-term benefits are contingent on patients engaging in sufficient quantity and quality of exercise during the programme to improve exercise tolerance and increasing their habitual physical activity. Not all patients who begin PR complete the programme and poor long-term adherence to physical activity recommendations is described as a common problem and one that has a deleterious impact on COPD symptoms, exercise tolerance and quality of life. A critique of interventions designed to promote engagement and adherence to PR is provided.

Chapter 3: Motivational interviewing – background and theory. This chapter contains an account of the origins, development and purpose of MI, and a description of the method. A distinction is made between MI as described by Miller and Rollnick (referred to throughout the thesis as MI in its *pristine* form), and derivatives of MI that do not contain all elements that are theoretically or empirically related to its efficacy. The points made justify the focus on MI in its *pristine* form within the thesis research. There is a description of the theories that have been logically linked to MI to help rationalise its effectiveness, and a critical review of research elucidating its hypothesised mechanisms of action. This chapter also contains a critique of MI, which draws attention to the variability in the effect of MI observed in outcome research, as well as to the limitations of the method and unanswered questions. Finally, there is a consideration of treatment fidelity as it relates to the research contained within this thesis.

Chapter 4: Motivational interviewing – evidence reviews. To enable judgments about the potential of using MI as an adjunct to PR, there is a scoping review of relevant research testing the effectiveness of MI for promoting physical activity (see section 4.1 for a definition of scoping reviews). The conclusion drawn from this review provides a rationale to examine the acceptability and feasibility of this application of MI.

There is evidence to suggest that outcomes of MI are moderated by the skill with which it is delivered, and also that MI is not easy to learn and deliver as intended. Therefore, this chapter contains a review of research on the effect of different forms of MI training on skill acquisition. Consideration is also given to models that may be used to guide training development and evaluation, with a particular focus on the declarative-procedural-reflective (DPR) model. This model conceptualises the processes involved in acquiring and refining psychological skills

(Bennett-Levy 2006). It was used as part of the research reported within this thesis to guide the refinement of training content used in study 2 (learning MI) and to underpin the interpretation of participants' training experiences reported in study 3.

The case is made in this chapter that health professionals such as those who deliver PR in the UK NHS (primarily nurses and physiotherapists) may find it particularly challenging to develop competence in MI. Because the thesis research is focused on the feasibility of MI delivered by PR clinicians, the author completed a second scoping review on the effect of MI training for health professionals. The insights gained from this review underscore the need to evaluate the effect of MI training for PR clinicians as part of the overall assessment of feasibility. The chapter concludes with a discussion of how the overarching research questions for the research contained in this thesis emerged from the evidence reviews.

Chapter 5: Research methodology. The case is made within this chapter that integrating MI within PR constitutes a complex intervention. In accordance with MRC complex intervention guidance, prior to formal testing and widespread dissemination there are several important tasks to undertake that relate to intervention development, feasibility and pilot testing, evaluation and implementation. The key tasks involved in this programme of research, aligned with the complex intervention framework are presented within this chapter.

A mixed methods approach involving a multiphase design was employed to address the research aims and associated questions. This chapter contains a description of the design and rationale for integrating qualitative and quantitative studies. The philosophical assumptions that guided the research design, data collection and analysis are also presented.

Chapter 6: Study 1 Respiratory clinicians' views of motivational interviewing. The first study presented in this thesis employed a qualitative design with semi-structured interviews to gather respiratory clinicians' views of MI following a one-day 'Introduction to MI' workshop. Thematic analysis was used to explore and present meaning from the interview data. Four main themes were identified, which are presented in a thematic map. Collectively, these describe clinicians' perceptions of the value of MI to their practice and potential issues relating to implementation into routine care. Personal and professional barriers that were perceived to influence MI skill acquisition are also represented. The chapter concludes with a summary of the implications of the findings for the development of the MI intervention and associated training package used in study 2.

Chapter 7: Development of the motivational interviewing intervention and training package. The focus of this chapter is the design of the proposed MI intervention and the associated training package used in study 2. It begins with the presentation of a logic model of

the problem of sub-optimal engagement and adherence to PR. This was informed by discussions with PR clinicians and the theoretical and empirical insights derived from chapters 2, 3 and 4. The logic model was used to guide objective setting for the proposed MI intervention. Key features relating to timing, duration and aims of each component of the intervention are described within a process flow model. The design and content drew heavily on two intervention manuals describing the use of MI as an adjunct to the treatment of psychological problems (Zuckoff et al. 2015a; Zuckoff et al. 2015b) but focused on encouraging engagement and adherence to PR.

The training package used in study 2 to prepare participants to deliver the proposed MI intervention was informed by the reviews of the literature on learning MI presented within chapter 4, together with the views of respiratory clinicians gathered through study 1. Participants involved in study 2 were trained in six cohorts. The insights gained whilst training earlier cohorts were used to refine elements of the training package for use with those trained later. The DPR model was used to support this process. The modifications and associated rationale are also presented within this chapter.

Chapter 8: Study 2 - Learning and applying motivational interviewing. Study 2 employed a pre-post, single group quantitative design. This was used to measure the impact of a training package on MI skill amongst PR clinicians as part of the assessment of feasibility. Overall, the results lend support to the feasibility of the training package with improvements in MI skill evident following training. Several issues were highlighted that warranted further exploration though. These included difficulties completing training activities, variable skill acquisition and problems integrating MI into clinical practice.

Chapter 9: Study 3 - Trainee experiences and insights. Study 3 was designed to explore the experiences of participants involved in study 2 and identify ways to address the issues encountered. This final study employed a qualitative design involving semi-structured interviews and framework analysis. The thematic map presented in this chapter contains three key themes. The first describes the culture within which participants operate and in particular the service and professional drivers of normal practice that sit in tension with MI. These provide a context that help make sense of the difficulties associated with learning and implementing the skills in practice. A second theme represents the cognitive and emotional challenges that participants encountered whilst acquiring and using MI skills. The third theme focuses on the lessons learnt for the future in terms of the MI training package and the service and programme design issues that influence MI learning and implementation in clinical practice. To help make sense of the challenges that these clinicians faced when learning and applying MI, these findings are logically linked to the DPR model.

Chapter 10: Overall summary and conclusions. The final chapter contains a synthesis of the findings from the three studies and a consideration of these in the context of the overall research aims. The implications for future research are discussed.

Chapter 2: The clinical challenge - improving engagement and adherence to physical activity recommendations in pulmonary rehabilitation

2.1 Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a respiratory condition that is a leading cause of morbidity and mortality worldwide and places a significant burden on any healthcare system and society (GOLD 2020). Pulmonary rehabilitation (PR) is a group-based programme of exercise, physical activity, education and support that is recommended as a cornerstone in the management of COPD (Bolton et al. 2013; Spruit et al. 2013b; GOLD 2020). A chief aim of PR is to break the cycle of deconditioning and reduced physical activity that is characteristic of the disease, achieved through structured exercise designed to increase exercise tolerance and the provision of support to facilitate increases in daily physical activity (Spruit et al. 2013b; Troosters et al. 2013; Singh 2014). The challenge of achieving regular physical activity in COPD is reflected in consensus statements and clinical guidelines for PR that emphasise the importance of helping patients to change behaviour (Bolton et al. 2013; Spruit et al. 2013b; GOLD 2020).

Within this chapter is an overview of COPD and PR. It includes a description of the short and long-term effects of PR on exercise tolerance and physical activity and a review of interventions that have been used adjunct to PR to help patients become more active.

2.2 Chronic Obstructive Pulmonary Disease

2.2.1 Definition and epidemiology

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) state that:

> *Chronic Obstructive Pulmonary Disease (COPD) is a common preventable and treatable disease that is characterised by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases ...* (GOLD 2020, p. 4).

Furthermore:

> *COPD is a leading cause of morbidity and mortality worldwide that induces an economic burden that is both substantial and increasing.* (GOLD 2020, p. 5)

There are an estimated 1.2 million people in the United Kingdom (UK) with a diagnosis of COPD, approximately 2% of the population (Snell et al. 2016). The prevalence increased by 27% in the last decade though it is not clear whether this is due to improved detection or that COPD is more common. In 2012 COPD caused nearly 30 000 deaths, which makes it the UK's fifth biggest cause of death (Snell et al. 2016). The prevalence and burden are predicted to rise due to a combination of continued exposure to risk factors and the increasing age of the population (GOLD 2020).

The cost of COPD to the UK National Health Service (UK NHS) is significant. Over 140 000 hospital admissions and more than 1-million inpatient bed days each year are attributed to the disease (Snell et al. 2016). An estimate of the direct costs to UK NHS in 2014 was £1847 million (British Lung Foundation 2017).

2.2.2 **Symptoms**

COPD symptoms include dyspnoea, wheeze, cough and excess sputum production with systemic effects resulting in peripheral muscle weakness and associated exercise intolerance (GOLD 2020). COPD has a negative impact on health-related quality of life (HRQL); the symptoms are typically distressing and fatiguing and can disrupt normal activities and social functioning. They can also undermine psychosocial wellbeing with depression and anxiety common amongst those with the disease (Yohannes and Alexopoulos 2014; GOLD 2020).

2.2.3 **Diagnosis and classification**

A diagnosis of COPD is made based on the degree of airflow limitation using spirometry. The presence of post-bronchodilator[6] forced expiratory volume in 1-second (FEV_1)/ forced vital capacity (FVC) ratio of less than 0.70 (that is the proportion of an individual's vital capacity that they can expire in the first second on exhalation) is used to confirm the presence of persistent airflow limitation that is COPD (GOLD 2020). Assessments of COPD severity are also made based on post-bronchodilator spirometry. Table 2-1 (page 13) shows the classification of severity of COPD based on airflow limitation.

[6] Medication designed to relax the bronchial muscles. This makes the airways larger and allows air to pass through to the lungs more easily.

Table 2-1 *Classification of Airflow Limitation Severity in Chronic Obstructive Pulmonary Disease*

Stage	FEV_1
In patients with FEV_1/FVC of < 0.70	
GOLD I: Mild	≥ 80% predicted
GOLD II: Moderate	50% ≤ FEV_1 < 80% predicted
Gold III: Severe	30% ≤ FEV_1 < 50% predicted
GOLD IV: Very Severe	FEV_1 < 30% predicted

Note. FEV_1 = forced expiratory volume in one second; FVC = forced vital capacity. Based on post-bronchodilator FEV_1). Adapted from "Global Strategy for the Diagnosis, Management and Prevention of Chronic Obstructive Pulmonary Disease" by GOLD (2020).

2.2.4 **Exercise intolerance**

Regular physical activity including exercise can be challenging for people with COPD, a phenomenon commonly referred to as 'exercise intolerance'. The respiratory and skeletal muscle pathophysiology of COPD undermines pulmonary ventilation and increases ventilatory requirements during physical activity (Troosters et al. 2013). This increases dyspnoea and fatigue and can make physical activity an aversive experience, which often leads to activity avoidance (Polkey and Rabe 2009; Polkey and Moxham 2011). Depression and anxiety, which are common features of COPD make physical activity even more challenging (DiMatteo et al. 2000; Di Marco et al. 2013), as can acute exacerbations of the disease (most commonly caused by respiratory tract infections). Physical activity levels are known to be very low whilst patients are hospitalised for a COPD exacerbation and often remain so after the infection has resolved (Pitta et al. 2006; Borges and Carvalho 2012). Deconditioning that results from reduced activity can lead to a spiral of declining physical activity, reduced exercise tolerance and increasing symptoms (Polkey and Rabe 2009; Polkey and Moxham 2011; Troosters et al. 2013). This is shown in Figure 2-1 (page 14).

Clinically, exercise tolerance is assessed in two ways. Functional exercise capacity measures a patient's ability to endure exercise, for example, the distance that can be walked in 6-minutes (Spruit et al. 2012; Holland et al. 2014). Measuring maximal exercise capacity involves an incremental, progressive walking or cycle ergometer test, which assesses the patient's symptom-limited maximal performance (Holland et al. 2014).

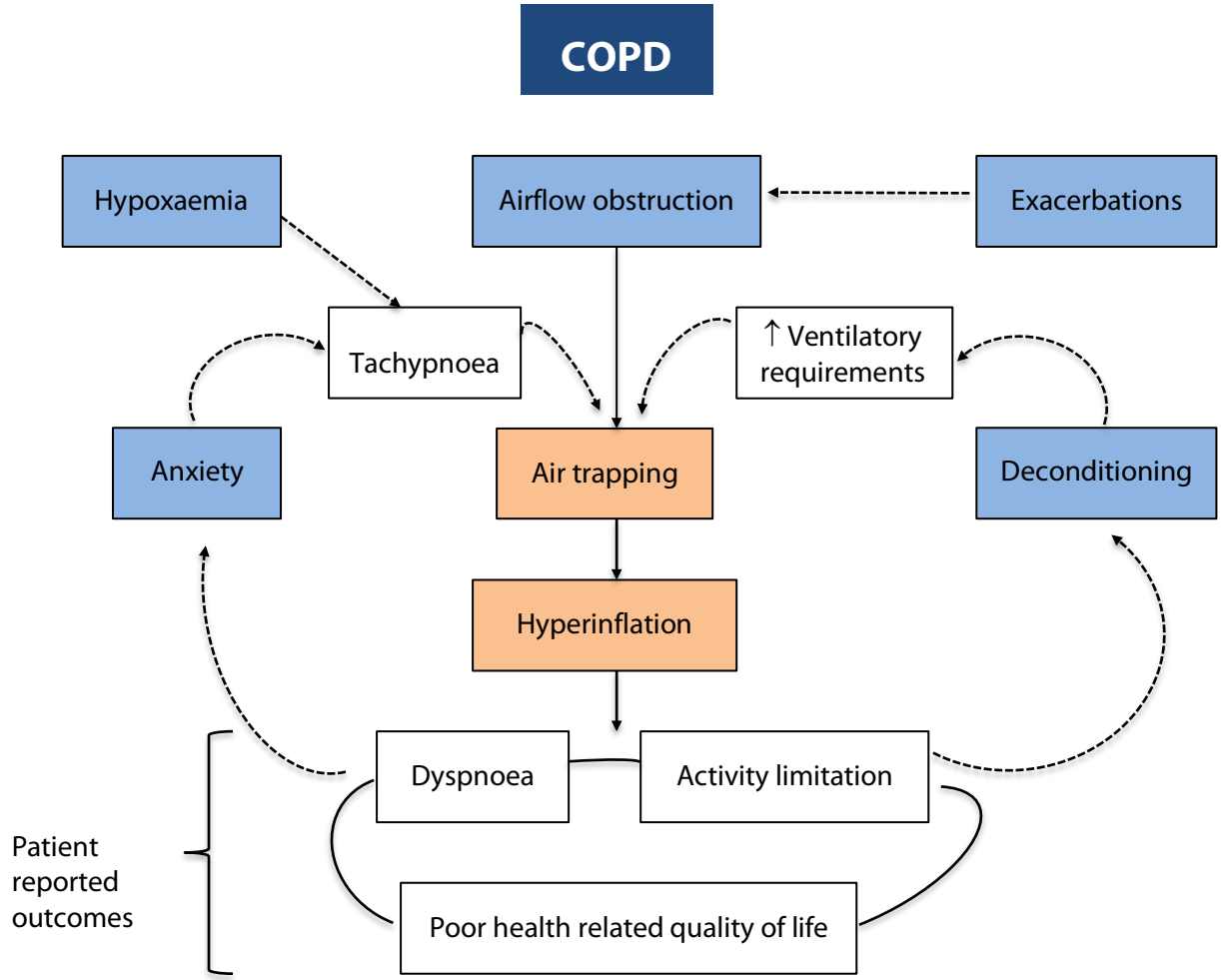


Figure 2-1. The pernicious cycle of inactivity and symptoms in Chronic Obstructive Pulmonary Disease (COPD).
From "Improving physical activity in COPD: Towards a new paradigm" by T Troosters, T van der Molen, M Polkey, RA Rabinovich, I Vogiatzis, I Weisman and K Kulich (2013). *Respiratory Research* 14(1): 115.

2.3 Physical activity in Chronic Obstructive Pulmonary Disease

2.3.1 Recommended quality and quantity of physical activity

The UK Chief Medical Officers (Department of Health 2019) recommend all adults accumulate a minimum of 150-minutes of moderate intensity physical activity per week (the equivalent of brisk walking for apparently healthy individuals); or 75-minutes of vigorous intensity physical activity (for example running); or shorter durations of very vigorous activity (such as stair climbing); or an equivalent combination of moderate, vigorous and very vigorous activity. Muscle strengthening activities (such as heavy gardening or resistance exercise) performed at least twice a week are also recommended as is restricting the amount of time being sedentary and interspersing long periods of inactivity with light physical activity. Guidelines for older

adults aged 65 years and above are similar but targets for physical activity do not include very vigorous physical activity. The recommendations also include advice to engage in activities designed to improve strength, balance and flexibility on at least 2-days per week.

Individuals with COPD are also encouraged to be physically active and to engage in structured exercise (Watz et al. 2014; Garvey et al. 2016; GOLD 2020). The World Health Organisation (WHO) state that those limited by a health condition should "be as physically active as their abilities and conditions allow" (World Health Organisation 2010 p.8). Garvey et al. (2016) have summarised exercise recommendations presented within guidelines/statements from the American Colleges of Sports Medicine (ACSM), the American Thoracic Society (ATS) and European Respiratory Society (ERS) and American Association of Cardiovascular and Pulmonary Rehabilitation (AACPR). The consensus is that exercise training principles (such as progressive overload) that are recommended for apparently healthy individuals also apply to those with COPD. As such, people with COPD should engage in both endurance and resistance training with the specific recommendations and progression tailored to individual needs and initial response. Endurance training should be performed at least three to five times per week, with ultimate targets of more than 60% of maximal peak exercise. Whilst guidelines differ with regard to initial workload, rate of progression and session duration, the review authors concluded that exercise duration of at least 20-minutes if the patient is able would be reasonable. Specific recommendations for resistance exercise for people with COPD were not made within any of the three guidelines/statements, though both the ACSM and ATS/ERS refer to guidelines provided for apparently healthy adults and/or older adults (for example the ACSM recommend a frequency of at least two times per week, an initial intensity of 40-50% of one repetition maximum building to 60-70%, one to four sets of eight to 10 exercises involving all major muscle groups and 10-15 repetitions per set).

2.3.2 **Benefits of physical activity in Chronic Obstructive Pulmonary Disease**

Physical inactivity is a strong predictor of COPD exacerbations and all-cause mortality (Gimeno-Santos et al. 2014; Watz et al. 2014). In a systematic review, Gimeno-Santos et al. (2014) found consistent evidence for associations between low levels of regular physical activity and hospital admission (or readmission due to COPD exacerbations) and all-cause mortality. These conclusions were based on the results of eight and seven longitudinal studies respectively, each of which adjusted the estimates of associations for known confounding variables such as COPD severity and previous COPD exacerbations. The quality of the evidence was moderate for both outcomes (based on the Grading of Recommendations Assessment, Development and Evaluation), with a reliance in the larger studies on self-reported physical activity rather than objective measures undermining the grade. The heterogeneity of the reviewed studies

precluded meta-analysis of outcomes. According to Watz et al. (2014), the amount of regular physical activity required to significantly reduce the risk of COPD related hospital admissions equates to approximately 2-hours per week of walking or cycling.

2.3.3 Patterns of physical activity in Chronic Obstructive Pulmonary Disease

People with COPD tend to be less active than apparently healthy individuals, and the activity they do tends to be performed at a lower intensity. Most are not active at recommended levels (Watz et al. 2014; GOLD 2020).

Vorrink and colleagues (2011) systematically reviewed studies comparing objectively measured physical activity of patients with COPD with those of age-matched, healthy controls. Across the five studies reporting the duration of activity (that is the proportion of total recording time in which the individual was active), participants with COPD performed only 35% to 83% of the daily physical activity of controls (mean 57%). In absolute terms, based on the study in which the value of percentage physical activity was closest to the mean in the review (Pitta et al. 2005), this equates to a walking time of 44 (±26) minutes/day for COPD patients versus 81 (±26) minutes/day for the healthy elderly control participants ($p < .001$). In this study, standing time was lower for COPD patients (191 ±99 minutes/per day versus 295 ±109), but they spent more time sitting (374 ±139 minutes/day versus 306 ±108, $p = .04$) and lying (87 ±97 minutes/day versus 29 ±33, $p < .01$).

There is some evidence that physical activity levels are lower with increased severity of COPD, though the pattern is not clear. Saunders et al. (2016) reported results of a meta-analysis of studies measuring steps per day taken by participants with COPD. Across 38 studies the pooled mean estimate was 4579 steps per day (95% CI: 4310, 5208). A significant proportion of the variance in steps per day was accounted for by 6-minute walk distance ($\beta=12.0$, $R^2=0.30$, $p < .01$), FEV_1%, ($\beta=62.2$, $R^2=0.28$, $p < .001$), and whether patients were about to begin PR (about to undergo PR: 3667 steps/day; not about to undergo PR: 4888 steps/day, $p > .05$). In the multivariable regression model, only FEV_1% was associated with steps/day after adjusting for other covariates ($\beta=45.7$, $p = .04$).

Donaire-Gonzalez et al. (2013) reported reduced activity with increased severity of disease. In a cohort of 177 patients, the authors found an inverse relationship between disease severity and time in physical activity, proportion of activity time in bouts of at least 10 minutes (at an intensity greater than 1.5 METS) as well as the frequency of such activity bouts (all trends $p < .05$). Significant differences between mild-moderate and severe-very severe disease classifications were evident for all physical activity variables ($p < .05$). These data show that in

addition to an overall reduction in daily physical activity, the pattern of activity may also change with disease severity. The relationship between disease severity and activity is not always observed though. Pitta et al. (2005) found no significant difference between walking time between patients with GOLD stages 1 and II disease compared with GOLD stage III ($p > .05$) and GOLD stage IV ($p > .05$). Vorrink and colleagues (2011) did find a correlation between disease severity and physical activity in their systematic review, but the relationship was not strong.

2.4 Pulmonary rehabilitation

2.4.1 Definition

Pulmonary rehabilitation (PR) is used to address the spiral of deconditioning described in section 2.2.4 (page 13) and represents a cornerstone in the management of COPD (Bolton et al. 2013; Spruit et al. 2013b; GOLD 2020). The ATS and ERS have defined PR in a joint statement:

"Pulmonary rehabilitation is a comprehensive intervention based on a thorough patient assessment followed by patient tailored therapies, which include, but are not limited to, exercise training education, and behaviour change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence of health enhancing behaviours." (Spruit et al. 2013b, p. e16)

Variation exists in the content, structure and mode of delivery of PR (Spruit et al. 2013a), though most programmes are face-to-face, and last between 6-12 weeks, during which time patients meet two to three times each week to undertake group exercise and receive disease specific education and support. Patients are also encouraged to increase their daily physical activity between PR sessions and to maintain increased levels of physical activity after the programme has ended (Bolton et al. 2013; Spruit et al. 2013b; GOLD 2020). The British Thoracic Society (BTS) quality standards for PR programmes indicate that all patients completing the programme should be provided with an individualised, structured plan to support exercise maintenance (British Thoracic Society 2014). In April 2018, the Royal College of Physicians launched a PR Services Accreditation Scheme in association with the BTS and British Lung Foundation to support quality improvement in PR services (Royal College of Physicians 2019).

2.4.2 Focus on behaviour change

An important revision to the previous ATS/ERS statement on PR (Nici et al. 2006) is the explicit emphasis on helping patients to initiate and sustain changes in health behaviour:

> *"… the educational component of pulmonary rehabilitation has gradually evolved from a traditional, didactic approach to the promotion of adaptive behaviour change, especially collaborative self-management."* (Spruit et al. 2013b p. e28).

As Singh (2014) has noted, the traditional aim of PR has been increasing exercise tolerance in the hope that this will translate into increased physical activity after rehabilitation has ended. However, whilst being able to tolerate exercise is "permissive of activity" (Casaburi 2011, p. 335), it does not automatically lead to its performance. Exercise tolerance is an attribute (Caspersen et al. 1985) whilst physical activity is a behaviour that has personal, environmental, social and cultural determinants (Casaburi 2011; Troosters et al. 2013; Gimeno-Santos et al. 2014). That exercise tolerance and physical activity are two different entities may explain why they are only moderately correlated in COPD (Zwerink et al. 2013; Watz et al. 2014). This implies that PR programmes need to focus on motivating and supporting patients to increase their habitual physical activity as well as increasing their exercise tolerance through structured exercise (Spruit et al. 2015).

2.4.3 Outcomes of pulmonary rehabilitation

PR is known to improve dyspnoea, health status and exercise tolerance (Spruit et al. 2013b; McCarthy et al. 2015; GOLD 2020) and is considered to be one of the most cost-effective treatments for COPD with an estimated cost per quality adjusted life year of £2000-£8000 (Vogiatzis et al. 2016).

2.4.3.1 Attendance and programme completion

Regular attendance for PR is considered important because of its theoretical link with exercise dose and improvements in exercise tolerance (Bolton et al. 2013; Singh et al. 2014). Attendance is known to be variable however, and many patients withdraw prior to the end of the programme (Keating et al. 2011a; Hayton et al. 2013; Steiner et al. 2018).

In a systematic review of exercise training programmes including PR, Williams et al. (2014) reported a mean attendance for planned sessions of 89% (±14%) with large variation across studies (48% to 100%). These research findings are broadly consistent with those of a national audit of PR programmes in England and Wales, which reported that patients attended for a median 10 (interquartile range: IQR 5-12) of 12 (IQR 12-24) scheduled sessions (Steiner et al. 2018).

Programme completion, typically defined as the proportion of patients who achieve pre-defined criterion for attendance, is another measure of engagement. Williams et al. (2014) found completion rates varied from 40 to 100% across the 29 studies that provided *a priori* criteria.

Another review exploring barriers to PR attendance reported non-completion of PR between 10% and 32% (translates to 68-90% completion) (Keating et al. 2011a). There is emerging evidence that completion of PR delivered in the acute setting is particularly low with poor uptake and attendance evident (Harrison et al. 2014; Jones et al. 2014). Comparisons between reviews and individual studies are problematic because there is no agreed definition of programme completion. Review authors have relied on those definitions adopted within individual studies, which vary considerably, for example, between 50–100% of planned sessions in Williams et al. (2014). Moreover, in some studies, participants were deemed to be non-completers if they declined rehabilitation following referral, whereas others reported only on those who began the programme.

Several factors are known to be associated with lower attendance and completion of PR. They include extremes of age, being female, being from a minority ethnic group, current smoker, long-term oxygen use, having poor access to travel and transport, inconvenient timing of PR that disrupts normal routines, illness relating to respiratory disease and co-morbidities, having depression, poor quality of life, a lack of social support, low exercise tolerance and a lack of perceived benefit from attendance (Sabit et al. 2008; Fischer et al. 2009; Keating et al. 2011a; Hogg et al. 2012; Hayton et al. 2013; Boutou et al. 2014; Cassidy et al. 2014; Harrison et al. 2014; Brown et al. 2016; McNaughton et al. 2016).

Motivational issues and relational factors (between PR clinicians and patients) have received less attention, perhaps because they are complex constructs that are difficult to measure. Studies exploring reasons for non-uptake of PR have reported that patients are consumed by their symptoms, which results in a fear of exercise and breathlessness and concerns about losing control (Harris et al. 2008). Uncertainty regarding the benefits of PR and unresolved ambivalence has also been linked to sub-optimal uptake and engagement with PR (Harris et al. 2008; Lewis et al. 2014). Another relatively common finding is that patients are at risk of withdrawal if they perceive they are not benefiting from their involvement and/or are not making progress towards their goals (Keating et al. 2011a; Keating et al. 2011b).

On completion of PR, it is customary to offer a follow-up consultation, which provides an opportunity to reflect on progress and consolidate motivation for sustained behaviour change. Attendance for this appointment is known to be variable though. In an earlier England and Wales PR audit in which detailed information relating to the discharge appointment was obtained (Steiner et al. 2015), 23% of patients had this appointment scheduled, and 7% failed to attend it. A key measure of PR quality is the proportion of patients receiving a written plan for exercise maintenance on (British Thoracic Society 2014). In the more recent audit this figure was 81% (Steiner et al. 2018).

2.4.3.2 Short term effects on exercise tolerance

A substantial body of evidence has demonstrated that PR incorporating physical activity results in short-term improvements exercise tolerance amongst individuals with stable COPD (Spruit et al. 2013b; McCarthy et al. 2015; GOLD 2020). A Cochrane review reported that PR leads to a significant effect on functional exercise capacity measured using the 6-minute walk test (McCarthy et al. 2015). Across 38 randomised controlled trials (RCTs) a statistically significant difference in improvement was reported between rehabilitation and controls (weighted mean difference 43.93 metres, 95% CI: 32.64, 55.21; p< .001) which exceeded the minimal clinically important difference (MCID) for those with COPD (30-metres) (Holland et al. 2014). Across 16 studies that measured maximal exercise capacity using a cycle ergometer, the weighted mean difference between rehabilitation and controls was 6.77 watts (95% CI: 1.89, 11.65; *p*< .01). Although the mean effect exceeded the MCID (4-watts) (Puhan et al. 2011) the lower confidence interval fell short. Of the eight trials using the incremental shuttle walk test to assess maximal exercise capacity, participants allocated to receive PR outperformed usual care controls by 39.77 metres (95% CI: 22.38, 57.15; *p*< .001). Though this was a statistically significant finding the difference was below the MCID of 47.5 metres (Singh et al. 2008; Singh et al. 2014).

Taken together, these data demonstrate that PR leads to statistically significant improvements across measures of exercise tolerance. The magnitude of change in functional exercise capacity is clinically meaningful, though for maximal exercise capacity the improvements fell short. It is possible that increases in the quantity and quality of exercise performed through improved adherence during rehabilitation sessions may improve these outcomes further.

2.4.3.3 Maintenance of benefits

The initial improvements in exercise tolerance that occur through PR tend to decline in the months after the programme has ended (Bolton et al. 2013; Spruit et al. 2013b; Spruit et al. 2015). Griffiths et al. (2000) reported significant increases in shuttle walk distance following a 6-week PR programme relative to a group receiving standard care (between group difference adjusted for baseline value 75.9 metres, 95% CI: 61.0, 90.8; *p*< .001). Whilst significant between-group differences remained at the 1-year follow-up, the magnitude of difference had reduced, primarily because of a deterioration within the rehabilitation group (between group difference 28.1 metres, 95% CI: 10.9, 45.3; *p*< .001). Furthermore, the absolute value for walk distance at 1-year within the rehabilitation group (148 metres ±103) approached the baseline value (140 metres ±94) and fell short of the MCID.

There is some evidence that beneficial effects of PR may persist longer than 12-months. Troosters et al. (2000) reported significantly greater improvements in 6-minute walking distance

within a group receiving PR relative to usual care controls 18-months after having started the programme (90 metres, 95% CI: 41, 149; $p < .01$). This is at odds with previous studies that showed no such long-term effects (Ries et al. 1995; Strijbos et al. 1996) but may be the result of the longer duration of PR (6-months compared with 8-12 weeks of PR).

Differences across studies in disease severity, the timing of follow-up, duration of PR, and outcome measures makes it difficult to accurately describe the pattern of decay in benefit. The consensus of the American College of Chest Physicians (ACCP) and American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) though, is that in the absence of any maintenance strategies, improvements in exercise tolerance following PR tends to decline gradually towards pre-rehabilitation levels over 12 to 18 months (Ries et al. 2007).

It is not possible to give a definitive explanation for the decline in exercise tolerance following PR since most studies have not objectively evaluated patient behaviour after the programme. According to the consensus statement from the ATS/ERS it cannot be explained entirely on the basis of declining disease status (Spruit et al. 2013b). Rather there must be a behavioural component; specifically, poor adherence to physical activity recommendations results in a reversal of training effects (detraining) (Serres et al. 1998; Garber et al. 2011).

2.4.3.4 Effects of pulmonary rehabilitation on physical activity

A goal of PR is to help patients to transfer the gains made in exercise tolerance to increased physical activity after the programme has ended (Spruit et al. 2013b; Singh 2014; Spruit et al. 2015). Studies evaluating the effects of structured exercise programmes including PR on objectively measured physical activity have been reviewed by Cindy Ng et al. (2012). They found two randomised trials and five cohort studies involving 4-weeks or more of supervised exercise training and reported an overall effect size of 0.12 ($p = .01$), which equated to an increase of daily walking of 5.4-minutes from pre to post rehabilitation.

Since the end of the review period in Cindy Ng et al. (2012), four additional studies have reported the effect of PR on objectively measured physical activity (Mador et al. 2011; Egan et al. 2012; Saunders et al. 2016; Mesquita et al. 2017). A summary of each of these studies is provided in Appendix A (page 323). None of the PR programmes resulted in an increase in physical activity following rehabilitation.

The majority of studies reviewed above involved short-term follow-ups, most commonly reporting physical activity immediately after rehabilitation had ended. A different question is whether PR promotes sustained changes in physical activity. Dyer et al. (2013) measured physical activity at 6-weekly intervals post PR (0, 6, 12, 18 and 24 weeks) within a sample of 28

participants. Assessments were made using a uni-axial accelerometer over a 2-day period. There was no significant decrease in mean minutes of uptime (sum of standing and walking activity) between post-PR (617 minutes/48hrs ±209) and the 24-week follow-up (599 ±194) (all *ps*> .05), though there was wide variation across participants in change in uptime from a decrease of 40% to an increase in 120%. Whilst these data provide evidence of maintenance of physical activity post-PR, overall, physical activity levels across assessment points were low. Moreover, pre rehabilitation physical activity was not measured so the extent to which represented a change from habitual levels is not known.

Overall the results of published studies are inconsistent, and interpretation is complicated by differences in the structure and content of PR, methods for assessing physical activity and the disease severity of participants. Of note, a lack of change in the group average within studies often masked a heterogeneous response. For example, Mesquita et al. (2017) reported no mean group effect of a comprehensive 8-week PR programme on measures of sedentary behaviour and physical activity. However, the results revealed six sub-groups, each with a distinctive response. Of these, the two most common were 'good responders' (34% of the sample) who increased their physical activity and reduced sedentary behaviour and 'poor responders' (30%) who decreased their physical activity and increased sedentary behaviour.

Several limitations exist across the reviewed studies. Most were small scale with a high loss to follow-up. None of them employed a RCT design capable of controlling for attention[7] and the passage of time. Finally, the period of activity monitoring in some studies was shorter than is considered necessary to capture normal activity levels (Hecht et al. 2009) or was measured whilst participants were still engaged in PR. Another potential limitation lies in the interpretation of raw data provided by accelerometers. Whilst these devices provide a precise measure of activity, they require researchers to interpret the significance of the output (acceleration per unit of time). Yet, it is not clear whether it is the overall amount of energy expenditure that explains the beneficial effects of physical activity in COPD or if physical activity needs to performed at a minimum intensity and/or duration for it to be beneficial (or if is some combination of volume and bouts that is important) and there is a lack of consensus regarding what constitutes a MCID for physical activity in COPD (Tudor-Locke et al. 2009; Tudor-Locke et al. 2011; Demeyer et al. 2016). Use of the same moderate and vigorous intensity cut-points that are used to define beneficial activity for apparently healthy populations may not be relevant for those with COPD (Cavalheri et al. 2016).

[7] Two randomised trials included in the Cindy Ng et al (2012) review involved two different interventions, both designed to increase physical activity.

Robinson et al. (2018) reported results of a systematic review of studies exploring the patient reported facilitators and barriers to physical activity following PR. Using a thematic synthesis, three broad themes were identified from the 14 qualitative studies. The first theme related to beliefs. Participants' intentions to maintain physical activity following PR were influenced by its perceived importance. Those who were active prior to COPD diagnosis were more likely to have positive intentions to continue. Self-efficacy was a common theme, with negative experiences of physical activity, COPD symptoms and exacerbations considered to undermine patients' confidence in their ability to sustain physical activity. In these circumstances, activity avoidance was often used as a coping strategy to manage symptoms and emotional reactions such as anxiety. By contrast, positive effects of stress and breathing management strategies promoted a sense of control of symptoms and increased self-efficacy. Finally, participants became more motivated when they noticed progression in the amount of physical activity they had performed and became aware of improvements in their symptoms. In many cases these insights resulted from reinforcement provided by health professionals. Self-monitoring was also deemed helpful in this regard. By contrast, a lack of perceived progress undermined motivation.

A second theme focused on social support. Three of the included studies involved post-rehabilitation support (for example community exercise or telephone support). The presence of health professionals following the programme engendered feelings of safety and meant that participants were less consumed by their symptoms. The removal of support following PR was perceived by some to undermine their motivation. This was due to difficulties translating PR based exercise to the home environment and a perceived need for more encouragement and reasons to keep going. Being able to relate to others who are encountering similar problems was considered a helpful incentive to continue exercising.

A third theme related to the environment. Opportunities for structured activity sessions following PR, and barriers to attendance such as time, cost and proximity were deemed to influence participation. In the absence of any structured maintenance programme, it was considered important to establish a routine that included regular physical activity. Participants noted that formulating a routine that addresses the challenges faced by those with COPD and that pre-empts relapsing back to prior activity levels is an involved process that takes time.

2.4.4 Behaviour change interventions to promote engagement with pulmonary rehabilitation and adherence to physical activity recommendations

In the previous section, it was highlighted that PR leads to short-term improvements in exercise tolerance, but the benefits decay over time and there is limited evidence that PR facilitates sustained increases in physical activity after the programme has ended. Whilst maintenance

programmes and repeating rehabilitation have both been shown to be beneficial in preserving gains in exercise tolerance (Beauchamp et al. 2013; Heng et al. 2014) and are recommended in the BTS Guidelines for PR (Bolton et al. 2013), they are resource intensive. Furthermore, since increased physical activity is contingent on clinician input, they are unlikely to represent a cost-effective means of promoting long term changes in physical activity.

These shortcomings have led to calls to identify methods that can be used an adjunct to PR to better address the factors that influence sustained behaviour change (Effing et al. 2014; Nici et al. 2014). Advice giving and education have traditionally been relied upon for this, but with limited evidence of effectiveness (Blackstock et al. 2014; Blackstock et al. 2016). The ATS and ERS recommend in their consensus statement on PR, that programmes include techniques derived from cognitive behaviour therapy (Spruit et al. 2013b). They describe operant conditioning, social cognitive theory and self- efficacy as the theoretical basis of effective interventions (Spruit et al. 2013b). In the next section is an overview of literature that that has evaluated the impact of interventions designed to encourage programme completion and sustained changes in physical activity following PR.

2.4.4.1 Interventions used to encourage programme completion

A key element of improving outcomes from PR is maximising the proportion who complete the programme. Jones et al. (2017) published a systematic review of interventions to improve uptake and completion of PR, but only one study met the review's inclusion criteria (Ringbaek et al. 2016). This was a quasi-randomised trial in which 115 participants were allocated to receive PR (7-10 weeks) and use of a tablet computer with training diary, videos and graphical feedback on exercise performed to monitor training (intervention) or PR alone (control). The intervention group were 11% more likely to complete PR (risk ratio 1.11, 95% CI: 0.96, 1.28), though this difference was not significant, and the trial was undermined by the non-randomised design and lack of blinding. The review authors concluded that there is insufficient evidence from RCTs regarding effective interventions to promote PR attendance and completion to guide clinical practice.

Results of other studies not included in Jones and colleagues' (2017) review, for example because they did not involve a randomised design (Graves et al. 2010), or were published after the review period (Cameron-Tucker et al. 2016) do not alter the conclusions drawn.

2.4.4.2 Interventions used as an adjunct to PR to promote adherence to physical activity recommendations

Several systematic reviews have summarised the results studies evaluating the effectiveness of behaviour change techniques (BCTs) (Michie et al. 2013) such as self-monitoring, for increasing physical activity in COPD (Vaes et al. 2013; Wiles et al. 2015; Wilson et al. 2015b; Lahham et al. 2016; Mantoani et al. 2016; Williams et al. 2017; Long et al. 2019). Lahham and colleagues' review (2016) is the most relevant to this discussion since it identified the greatest number of studies (n=5) that measured the effect of adding an intervention to PR on objectively measured physical activity. These studies involved a combined total of 221 participants (range: n = 21-80) with moderate to severe COPD. Each used a multi-component intervention combining physical activity monitoring with counselling. Participants either used pedometers to self-monitor steps for the duration of the study or wore an accelerometer in the week prior to counselling sessions. Counselling involved identifying goals for daily steps and the provision of feedback on performance relative to targets and in the case of three studies, was used to build motivation for change. One study used written health contracts to document goals and facilitators of increased activity.

Overall, adding behaviour change interventions to PR resulted in short-term improvements in activity levels at 3-months relative to PR alone (combined effect size n= 4 studies: 0.47, 95% CI: 0.02, 0.92; p= .04).[8] The mean within group increase in daily steps from baseline in these studies was 1452 (95% CI: 549, 2,356). The effect in improving outcome was not observed with longer follow-ups though (combined effect size n= 4 studies: 0.28, 95% CI: -0.08, 0.31; p> .05).[9] Outcomes of similar studies not included in this review do not change the overall conclusion (Greening et al. 2014; van der Weegen et al. 2015).

Whilst the results of Lahham and colleagues' (2016) review are encouraging, the authors noted that most studies were small-scale and undermined by several risks of bias most commonly a lack of blinding of outcome assessors and a failure to report outcomes for more than 85% of randomised participants (attrition was as high as 67% in one study). The authors concluded that the effect of interventions on physical activity, therefore, remains unclear.

Through the thesis author's own analysis of the literature, it was identified that the assessment of physical activity at follow-up within Cruz et al. (2016) and Kawagoshi et al. (2015) coincided

[8] One study measured physical activity at baseline and at the end of PR (12-months) and therefore did not contribute to the short-term (3-month) combined effect size.

[9] One study did not include a long-term follow-up and so did not contribute to the analysis of longer-term effects.

with the completion of activity counselling and therefore did not represent a true test of its effect on sustained, self-regulated physical activity. Only one study controlled for the additional attention provided by the counselling element of the intervention and none involved experimental manipulation of individual BCTs. It is therefore not possible to determine the unique contribution of each intervention component. This shortcoming has been observed in other systematic reviews of counselling for behaviour change in COPD (Williams et al. 2017; Long et al. 2019). For example, across nine physical activity focused studies, Williams et al. (2017) reported the mean number of BCTs within each intervention was (6.3 ±3.1). The authors concluded that it was difficult to draw conclusions about effective techniques, in part because no two studies shared the same BCT profile.

Guidance on the development and evaluation of behaviour change interventions emphasise the need to draw on appropriate psychological theory to underpin interventions and to make explicit the hypothesised mechanism(s) of action (Moore et al. 2015; Sermeus 2015; Bartholomew-Eldredge et al. 2016). This enables replication and refinement when sub-optimal results are observed. Whilst each study within Lahham and colleagues' review (2016) described the BCTs involved, most neglected to specify the theoretical framework used to underpin the intervention and guide practice. An exception was Cruz et al. (2016) who drew on social cognitive theory and hypothesised that setting goals with patients and providing objective feedback would enhance self-efficacy (a core construct within the theory). Though physical activity increased at follow-up, self-efficacy did not change, posing a problem for the hypothesised causal chain. Whilst Altenburg et al. (2015) measured perceived self-efficacy and behavioural self-regulation (the extent to which motivation is autonomous or relatively controlled), they did not specify how the intervention would exert its therapeutic effects. A protocol for a RCT of exercise counselling underpinned by self-determination theory (SDT) (Ryan and Deci 2000) delivered as part of PR has been published that does not appear to be limited by these shortcomings, but as yet, no results have been published (Rausch-Osthoff et al. 2017).

Another limitation of studies in Lahham and colleagues' review (2016) is that the majority neglected to define and describe the interpersonal style used to deliver the intervention, a point that has been raised within other reviews (Williams et al. 2017). This is problematic given that evidence from the fields of self-determination theory (Ryan and Deci 2000; Ryan et al. 2011) and motivational interviewing (MI) (Miller and Rollnick 2013; Moyers and Miller 2013; Moyers 2014) indicate that the nature and quality of the therapeutic relationship may independently influence behaviour change. Moreover, the interpersonal style used to deliver 'content-related' BCTs may moderate their impact (Hagger and Hardcastle 2014; Hardcastle 2016). For example, use of an empathic, autonomy respecting humanistic style as a foundation for goal setting, feedback and problem solving may lead to stronger, more enduring forms of motivation than

delivery that involves an authoritarian style which undermines autonomy and choice (Hagger and Hardcastle 2014).

MI is a specific form of counselling that emphasises the quality of the interpersonal relationship. Several studies described within Lahham and colleagues' review (2016) made reference to the use of MI techniques, though as will be discussed in the next chapter, it is unlikely that these represent *bone fide* tests of the method described by its founding fathers (Miller and Rollnick 2013).

2.5 Conclusion

PR is an important component of the management of stable COPD. To be maximally effective, patients need to engage in regular exercise during the programme and sustain increased levels of physical activity after rehabilitation has ended, yet evidence shows this is seldom achieved. The problem of suboptimal programme engagement and adherence to physical activity recommendations is summarised within the logic model shown in Figure 7-2 (page 175). The model is based on the empirical and theoretical insights presented in this chapter.

Any intervention that enhances PR engagement and promotes sustained increases in physical activity is likely to result in improved outcomes for patients and reduced health care utilisation. However, there is considerable gap in the literature regarding effective interventions used as an adjunct to PR to achieve these things. Most studies have produced only small effects that are short lived.

One under researched area is the effect of the interpersonal style adopted by intervention providers. This may be an important oversight since research in other contexts has shown that quality of the therapeutic relationship independently influences behaviour change and may also exert a synergistic effect on other active intervention components. One method that emphasises the relationship and carries potential to enhance the outcomes of PR is MI. There has been increasing interest in the use of MI in this context. Whist some interventions have been labelled MI, there has been a paucity of research investigating MI in its *pristine* form, that is incorporating all elements that are empirically or theoretically linked to its effectiveness and avoiding those which are antithetical to its style and principles (Miller and Rollnick 2014).

Therefore, the overall aim of the research presented in this thesis was to explore the feasibility of MI in its *pristine* form (rather than adapted). This involved developing and optimising a model for integrating MI within routine PR consultations and a training package that would be used to test whether PR clinicians could learn to deliver MI competently.

In the next chapter there is a description of MI and a summary of research clarifying its mechanisms of action. To enable judgments about the potential of this novel application of MI, there is a synthesis and critical appraisal of relevant outcome research. Consideration is also given to the effect of training for health professionals on MI skill development.

Chapter 3: Motivational interviewing - background and theory

3.1 Introduction

This chapter provides a background to motivational interviewing (MI) and includes the following:

- An account of the origins, development and purpose of MI, and a description of the method;
- A definition and justification for the focus of the thesis research on MI in its *pristine* form*;*
- A description of the theories that have been logically linked to MI to help rationalise its effectiveness and a critical review of process research that has tested MI's hypothesised mechanisms of action;
- A critique of MI, which draws attention to the variability in the effect of MI observed in outcome research as well as to the limitations of the method and unanswered questions;
- A consideration of treatment fidelity as it relates to the research contained within this thesis.

Although this thesis is concerned with the application of MI within a patient group, it is customary within the literature to use the term 'client' when referring to the people receiving MI. To that end, the term client is often used within this thesis where the background to MI is being described. Whilst MI may be delivered by a range of health professionals, the term clinician(s) is used throughout the thesis when referring to those providing MI, because the focus of the thesis is the feasibility of MI delivered by clinicians involved in the delivery of pulmonary rehabilitation (PR).

3.2 Origins and development

MI is a relatively brief person-centred method originally conceived as an alternative to advice giving and education for facilitating change amongst people with alcohol problems (Miller 1983). It aims to help those who want to, or need to make changes in their behaviour but have not done so (Miller and Rollnick 2013).

The original description of MI emanated during Miller's sabbatical in 1982 at an alcohol treatment facility near Bergen, Norway. He had been invited to lecture on behavioural treatments for alcohol problems and brought new findings from a clinical trial of behaviour therapy for controlled

drinking, which showed clinician empathy during treatment predicting a high proportion of the variance in drinking outcomes across 24-months of follow-up (Miller et al. 1980; Miller and Baca 1983).

As part of the sabbatical, Miller had been asked to meet with a group of psychologists to discuss the integration of client-centred counselling skills to deliver active components of a behavioural approach. Whilst demonstrating how he might interact with their clients, he was asked questions about the skills he was using, the direction he was taking, and the rationale for doing so. This required him to verbalise the implicit decision rules guiding his practice, of which he had not been consciously aware (Moyers 2004). The seminal paper on MI summarised these ideas and contrasted them with traditional models of motivation and ways to promote change (Miller 1983).

Miller challenged the prevailing wisdom that treatment failure is a reflection of client insufficiencies such as a lack of insight or desire. He also disputed the need for clients to accept the label of an 'alcoholic' no longer able to control their lives, which underpinned traditional treatment services. Consistent with insights from humanistic psychology (Rogers 1959, 1980), Miller argued that people with alcohol problems have an inherent capacity for change and desire for health. He conceptualised motivation as an interpersonal process, citing evidence that entry into, compliance with, and ultimately the success of, treatment is influenced by what clinicians do, and how they interact with the client, particularly in the early phase of treatment (Miller 1983). Viewing clients and the motivational process this way, Miller proposed that resistance to and within treatment is not a reflection of a character flaw, or an inherent part of the 'disease', as was the commonly held view. Rather, it is a reaction to clinicians who impose their own views about the client and what they need, and attempt to coerce them into change. Miller proposed MI as a constructive way to enhance motivation, by creating the conditions of support that allow clients to think about and verbalise their own reasons for change, and ways to achieve it (Miller 1983).

MI was originally conceptualised as motivational preparation for treatment. This is reflected in the original paper (Miller 1983) and the titles of the first two editions of the MI text '*Motivational interviewing*: *Preparing people to/for change*' (Miller and Rollnick 1991, 2002). Early studies revealed that MI may also operate as a treatment in its own right, with problem drinkers showing large reductions in alcohol use after having received a brief MI-based intervention, without receiving further treatment (Miller et al. 1988; Miller et al. 1993). In addition to promoting engagement and adherence to another treatment, it seemed that MI may also work by accessing and enhancing natural change processes, without the need for further input.

When Miller first introduced the method of MI it was in relation to people who drink too much alcohol. MI was quickly adopted as a method to help those with addiction problems more broadly (Miller and Rollnick 1991). The motivational challenges involved in stopping (or curtailing) problem drinking, drug use and gambling appear comparable to those experienced by people who would benefit from adopting new health behaviours. Thus, MI has also been applied to behaviours such as physical activity and healthy diet (Rollnick et al. 1999; Rollnick et al. 2008), and to clinical contexts to help those at risk of, or with established, disease (Lundahl et al. 2010; Thompson et al. 2011; Lundahl et al. 2013; Vanbuskirk and Wetherell 2013; O'Halloran et al. 2014; Ren et al. 2014; Morton et al. 2015; Frost et al. 2018; Soderlund 2018).

MI has now been identified as a method that may help to promote physical activity in people with Chronic Obstructive Pulmonary Disease (COPD). In an official European Respiratory Society statement on physical activity in COPD, Watz et al. (2014) cited MI as a potentially useful adjunct to exercise training to promote sustained behaviour change. In a subsequent invited review, Cavalheri et al. (2016) recommended use of MI as part of a broader suite of behaviour change strategies used as alongside exercise training to increase motivation, address barriers to change and encourage adherence to physical activity recommendations. Blackstock et al. (2016) recommended further research investigating the impact of adding psychologically informed interventions such as MI to PR on physical activity outcomes. More recently, Kahrmann et al. (2019) have systematically reviewed studies testing the effects of MI on physical activity in people with COPD, the majority of which involved MI as an adjunct to PR. The review authors found some evidence of effectiveness but recommended further research to address the limitations of studies in this area, prior to making more definitive conclusions.

3.3 Purpose: Preparing for change by resolving ambivalence

Many interventions designed to increase physical activity in COPD presume that patients are ready and willing to change and focus on helping them take action (Wiles et al. 2015; Wilson et al. 2015b; Lahham et al. 2016; Mantoani et al. 2016; Williams et al. 2017). MI differs from these approaches in that it helps to strengthen motivation and consolidate commitment, and thereby prepare people for change (Miller and Moyers 2017). It does so by exploring and resolving immobilising ambivalence, the simultaneous presence of competing motivations for and against change (Miller and Rollnick 2013).

Although patients with COPD may be motivated to attend PR and become more active to improve their breathing, avoid restriction in their activities and experience fewer exacerbations of their

condition, they may be simultaneously reluctant, or perceive themselves unable, to adhere to the physical activity recommendations that would enable them to accomplish those things. This may be because they find the breathlessness that results from physical activity too uncomfortable or anxiety provoking, because they lack confidence in their ability to change, or because exercise does not fit with their self-image.

The dynamics of ambivalence can cause people to take no action for long periods of time. The more a person considers one side of their ambivalence, the clearer the negative consequences become and the more the attractive the opposing side appears. Anxiety often results when people contemplate their choices yet feel unable to decide what to do. A natural reaction is to avoid thinking about the situation as a way of coping, or to concede that the status quo is acceptable (Miller and Rollnick 2013). Inevitably, the situation asserts itself again (for example a person with COPD experiences and feels constrained by their breathing issues) and awareness of the internal conflict heightens once more. This cycle can lead to frustration and decreased hope and optimism about the possibility of change, the longer it continues (Miller and Rollnick 2013).

According to MI theory, it is unresolved ambivalence rather than the absence of knowledge, skill or the 'right' attitude that is likely to undermine sustained behaviour change (Miller and Rollnick 2013). This ambivalence may be associated with the commonly observed sub-optimal engagement with PR and the failure to sustain changes in physical activity. MI seeks to guide a person towards identifying an acceptable resolution that triggers change and thereby galvanise their underlying motivation and commitment to a plan of action.

3.4 Three definitions of motivational interviewing

Miller and Rollnick (2013 p. 29) have provided three levels of definition of MI:

i) A layperson's definition addresses its purpose:

> *Motivational interviewing is a collaborative conversational style for strengthening a person's own motivation and commitment to change.*

ii) A practitioner's definition speaks to the issue of why a clinician might want to learn MI:

> *Motivational interviewing is a person-centred counselling style for addressing the common problem of ambivalence about change.*

iii) A technical definition describing how MI works:

Motivational interviewing is a collaborative, goal-oriented style of communication with particular attention to the language of change. It is designed to strengthen personal motivation for and commitment to a specific goal by eliciting and exploring the person's own reasons for change within an atmosphere of acceptance and compassion.

3.5 Applications: Standalone intervention or as an adjunct to active treatment

MI can be used as a standalone intervention to promote behaviour change or as an adjunct to other active clinical interventions and programmes, to maximise engagement and adherence to the partner intervention. The remainder of this section is focused on the use of MI as an adjunct to treatment, since this is the application that was explored in the research contained within this thesis.

The most common partners in the combined model have been cognitive behavioural approaches (Miller and Moyers 2017). To derive maximum benefit from these methods, clients need to adhere to the self-regulatory strategies that they learn about such as cognitive restructuring and behavioural activation (Glenn et al. 2013; Naar and Safren 2017). This can be difficult and without the necessary motivation, clients do not always implement the strategies and procedures that are recommended to them fully and are at risk of withdrawal. The purpose of the combined model is to use MI to build motivation and commitment to make behaviour changes and adhere to self-regulatory strategies learnt through the partner intervention (Miller and Moyers 2017). The effect of combining MI with cognitive behavioural approaches has been evaluated in several contexts and for different conditions including mental health disorders (Lawrence et al. 2017); anxiety disorders (Randall and McNeil 2017); being overweight or obese (Barrett et al. 2018b); and for physical activity maintenance for people with chronic health conditions (Scott et al. 2019).

The engagement and adherence challenges associated with cognitive behavioural interventions are mirrored by those observed in programmes such as PR. Patients referred for PR often find regular attendance and sustained adherence to exercise and physical activity recommendations difficult, and initial attempts have been made to use MI as an adjunct to PR to address these motivational challenges (de Blok et al. 2006; Altenburg et al. 2015; Burtin et al. 2015; Benzo et al. 2016; Holland et al. 2017). These studies are critically reviewed in section 4.2.2 (page 72) of this thesis.

There are several ways in which MI has been combined with other active interventions. One is a motivational prelude to prepare the person for the partner intervention (Zuckoff et al. 2015b;

Benzo et al. 2016; Holland et al. 2017; Rouleau et al. 2018). MI has also been used to provide ongoing motivational support during treatment, for example by providing a series of pre-planned MI-based sessions alongside the other treatment components (Burtin et al. 2015; Benzo et al. 2016; Holland et al. 2017). These sessions typically involve reviewing progress and discussing future goals and plans for change. Another way is as an approach that is called upon as the situation demands, for example if motivation needs enhancing, when resistance to change is encountered or if engagement and attendance decline (Simpson et al. 2010; Simpson and Zuckoff 2011; Westra et al. 2016). In practice, this can involve developing the client's readiness to address the problems they are having as well as resolving ambivalence about carrying out specific aspects of a treatment (Zweben and Zuckoff 2002; Maher et al. 2012). As Miller and Moyers (2017) have noted though, specific decision rules guiding the use of each component within treatment sessions are rarely defined.

Another application is to integrate MI within the partner intervention (Moyers and Houck 2011; Westra et al. 2016; Lawrence et al. 2017; Naar and Safren 2017; Barrett et al. 2018a; Scott et al. 2019). This involves using the relational and humanistic style of MI as a foundation for the delivery of other clinical tasks and procedures. Vansteenkiste et al. (2012) have argued that preserving the autonomy respecting component of the MI spirit when integrating with other interventions is central to satisfying client's basic needs and maximising the success of treatment. Questions have been raised however, as to whether integrating with the MI spirit alone constitutes a true integration of MI (Miller and Rollnick 2014; Arkowitz et al. 2015).

Section 7.2.3 (page 176) contains a description of the model for using MI as an adjunct to PR that was developed for study 2 (learning MI). This involved specific and strategic MI sessions, delivered either during routine appointments alongside other clinical tasks, or as separate (dedicated) appointments. The combined MI-PR model did not involve integrating MI with other intervention components or procedures.

3.6 The method of motivational interviewing

This section contains a description of the spirit (style of working), the processes that form the flow of MI, and the core skills involved.

3.6.1 The spirit of motivational interviewing

Of particular importance to effective MI is a spirit that is described as a way of being; the heart and mindset that guides its practice. Miller and Rollnick (2013) argue that if the approach is reduced to

a set of techniques without the underlying spirit, it will be mechanistic, like the "words without the music" (Miller and Rollnick 2013 p. 14). The four interrelated elements of the spirit are described in the sub-sections that follow.

3.6.1.1 Partnership

The relationship in MI is described as collaborative; a meeting of two experts who openly share their ideas about change. Clients are considered to be the experts on themselves with their ideas, values, goals and insights placed at the centre of the discussion. The clinician's role is to provide structure to the conversation and encourage power sharing in a way that facilitates client involvement (Moyers et al. 2015).

MI involves resisting the '*righting reflex*', that is acting on the desire to 'fix' the person when they perceive something is wrong by giving unsolicited advice and direction (Miller and Rollnick 2013). Information is only provided when it is asked for, or relevant, and delivered in a way that is respectful of the client's autonomy and decision making. Since sustained change requires ongoing investment of effort by the client, activation of their own wisdom and insights and involvement in decision-making is considered key to making this happen (Deci and Ryan 2012; Greene and Hibbard 2012).

3.6.1.2 Acceptance

Related to the notion of partnership is the attitude of acceptance of clients as they are (Miller and Rollnick 2013). Acceptance is rooted in the humanistic and client-centred traditions (Rogers 1959, 1980), which posit that when people are given the proper conditions of therapeutic support they tend to make 'healthy' choices, develop in a positive direction and realise their potential (Miller and Rollnick 2013; Moyers 2014). Acceptance has at least four aspects that are described below.

Absolute worth: This attitude involves recognising and valuing the worth and potential of the client and is akin to Rogers' notion of 'unconditional positive regard' (Rogers 1980). Miller and Rollnick (2013) assert that people are free to consider the possibility of change when they feel accepted as they are, whereas feeling judged can undermine natural change processes. This does not mean the clinician has to approve of the client's actions, rather it refers to an attitude of accepting the client's attitudes, beliefs and actions as understandable and legitimate.

Accurate empathy: This is the specific attitude and skill that Rogers' and his students described (Rogers 1959; Truax and Carkhuff 2008). Accurate empathy involves an unwavering interest in, and commitment to, understanding the client's perspective and internal frame of reference, and the

ability to convey that understanding through reflective listening (Moyers and Miller 2013; Miller and Moyers 2017).

Autonomy support: MI aims to increase perceptions of control and choice, and proscribes directing and persuading clients about the need for change, which can result in defensiveness and psychological reactance (Brehm and Brehm 1981; Patterson and Forgatch 1985; Miller and Rose 2009; de Almeida Neto 2017). The clinician emphasises the client's right to choose and self-determination, reinforces client's ideas about change, and actively explores options in a collaborative way, without any personal stake beyond helping them make informed decisions. Achieving this involves surrendering the idea (and responsibility) that it is possible or advisable to make people change (Miller and Rollnick 2013).

Affirmation: Consistent with its roots in positive psychology, MI seeks to draw out and make salient the client's effort, commitment and strengths. This is at odds with the medical model of care which focuses on what is wrong with the patient with solutions provided by the clinician (Miller and Rollnick 2013). Affirming involves a willingness to assume the lower place within the relationship rather than a position of authority or expertise (de Almeida Neto 2017; Miller 2017). In this sense it is communicated through genuine expressions of admiration, for example by commenting positively on a client's effort and courage in the face of challenging circumstances (Miller and Rollnick 2013).

3.6.1.3 Evocation

MI is underpinned by a competence worldview, which is that people have strengths, resources and insights about themselves that can be evoked. On the assumption that the client's own hopes, aspirations, values and ideas about how to change are likely to be the most influential, the clinician's task is to evoke and strengthen them (Miller and Rollnick 2013).

This mindset is quite different to the deficit model of motivation which underpins traditional approaches to encouraging change. Inherent in these approaches is the belief that motivational problems result from insufficiencies in knowledge, skill and insight, which can be addressed through education, advice, teaching of coping skills or diagnosis. Manifesting the evocative element of the MI spirit, therefore, often entails a cognitive shift in how clients are viewed and the clinician's role in supporting clients to change (Miller and Moyers 2007; Miller and Rollnick 2013).

3.6.1.4 Compassion

MI involves actively promoting the client's welfare and giving priority to their needs and interests. It bespeaks a willingness to attend to and support the client in resolving the difficulties and challenges they are experiencing.

3.6.2 Four processes of motivational interviewing

MI involves four overlapping processes, which provide a roadmap for navigating a MI consultation. The processes are sequential with work undertaken in the earlier processes providing a foundation for later portions of the conversation. The processes are recursive meaning there are occasions where it is appropriate to return to an earlier process that needs further consideration. Each process is described in the sub-sections that follow.

3.6.2.1 Engaging

The initial emphasis in MI is on building a trusting and respectful working relationship whilst attending to the client's concerns and goals. Engaging is foundational to all other processes (Moyers and Miller 2013; Moyers 2014) and mirrors the importance of the therapeutic relationship to psychological interventions more broadly (Norcross and Lambert 2019). The goal is for the client to experience the relationship as psychologically safe. That is one in which they feel listened to and accepted as they are, without judgment and efforts to control. This is seen as a necessary foundation for the client to discuss their ambivalence in an unguarded way (Zuckoff et al. 2015b).[10]

Engagement remains an important focus throughout MI and involves monitoring on a moment to moment basis whether there is sufficient momentum within the relationship to proceed with the directional elements of practice. The emergence of discord (dissonance in the working relationship) suggests that the client does not feel understood or accepted and indicates the need to re-engage. Reflective listening, whereby the clinician offers a statement that captures their understanding of what the client has said or meant, is a key approach to achieving this, although apologising, affirming shifting focus are also described (Miller and Rollnick 2013).

Miller and Rollnick (2013) have identified six traps which may promote disengagement particularly in the early portion of a consultation (see Table 3-1, page 38).

[10] An example of how this may be achieved within a PR context is provided within the PREAMP intervention manual used to train participants in study 2 (see 'Elicit the patient's story' strategy Appendix L).

Table 3-1 *Early Traps in Consultations That Promote Disengagement*

Trap	Meaning
Assessment trap	Initial assessment ahead of actual help prioritises service needs over those of the client. Question-answer structure places client in passive, one-down role and creates expectations for the nature of ongoing support. Conditions client to give short answers, rather than the elaboration required in MI. Value of questioning not obvious to client, who already knows the information they provide. Process risks alienating client.
Expert trap	Asking series of questions communicates uneven power and creates expectation that once sufficient information is gathered the clinician will provide the answer to the client's dilemma.
Premature focus trap	Focusing on change ahead of engagement. Clinician focuses on what they consider the priority to be rather than establishing the client's perspective. Drawing conversation back to discussing the clinician's formulation of the 'problem' without listening to the client's broader interests and concerns and irrespective of any discord that emerges.
Labelling trap	A specific form of the premature focus trap. Imposing a diagnostic label to focus on a particular 'problem'. May signify a power struggle in which the clinician seeks to gain control through expertise, which may result in unproductive debate and tension in the relationship.
Blaming trap	Ascribing fault or blame to the client for their predicament or not allaying the client's concerns about being blamed, which can result in defensiveness.
Chat trap	Off-topic discussion lacking in direction and focus.

Note. MI = motivational interviewing. Adapted from *"Motivational interviewing: Helping people change"* 3rd Edition by WR Miller and S Rollnick (2013). New York, Guilford Press.

3.6.2.2 Focusing

This is the process through which the topic of conversation is identified and maintained. The goal of focusing is to achieve a shared agreement about the most appropriate course for the

conversation. As described by Miller and Rollnick (2013) the source of direction may come from the client, the setting or the clinician's expertise (or some combination).

When the intended focus is obvious, for example during an appointment within a smoking cessation service, the clinician's task involves raising the subject whilst being sensitive to any broader issues or priorities the client wishes to discuss (Miller and Rollnick 2013). In chronic disease, there are often several behaviours which impact the course and management of the condition and clients typically have goals, expectations and concerns they hope will be addressed. Achieving a shared sense of direction in these circumstances is a more involved process. Agenda mapping has been suggested as a means to navigate this element of MI (Gobat et al. 2015) whereby options are considered and priorities are identified and agreed collaboratively.[11]

3.6.2.3 Evoking

The evoking process serves to explore and resolve ambivalence about change. When talking about change, it is normal for ambivalent clients to verbalise arguments both in favour of change (change talk) as well as for the status quo (sustain talk). Miller and Rollnick (2013) describe two types of change talk. Preparatory change talk refers to "client expressions of motivation for change without stating or implying specific intent or commitment to do it: examples are *desire*, *ability*, *reason*, and *need"* (p. 411). Mobilising change talk "expresses or implies action to change; examples are *commitment*, *activation language*, and *taking steps."* (p. 410). The reader is referred to the definitions of each subtype provided in the glossary of terms within this thesis. Sustain talk refers to thoughts expressed about the status quo and can be categorised in the same way.

Resolving ambivalence in favour of change involves differentially eliciting and strengthening change talk, whilst responding to sustain talk in a way that avoids prolonging or reinforcing it (see section 3.9, page 47 for a critical appraisal of research evaluating this mechanism of action). Evocative questions are asked to encourage the client to think out loud about their own motivations for change and how they could achieve it. When change talk emerges, it is developed and reinforced through further questions that invite elaboration, affirmations, reflective listening and summarising.[12]

[11] Examples of how these skills may be combined within PR are provided within the PREAMP intervention manual See the 'Raise the subject of physical activity and provide feedback' strategy (Appendix L).

[12] See 'Build motivation and confidence for increasing physical activity' and 'Explore hopes and fears for PR' strategies in Appendix L).

Clinician responses to sustain talk include reflective listening, the most common form being a straight reflection that acknowledges what the client said, meant or felt. Other reflective and strategic responses have been described. For a description of each, the reader is directed to Miller and Rollnick (2013 p. 199-204).

A guiding principle whilst evoking is to *develop discrepancy*. This involves exploring a client's values and aspirations, and encouraging them to think out loud about how their current behaviour and/or health situation influences their ability to lead the life that they want. Key to this is creating a non-judgmental, empathic environment that helps the client to contemplate and experience the discrepancy without feeling the need to disengage as a means of self-defence. As Miller and Rollnick (2013 p. 246) state "In essence, you are creating an atmosphere of safety that helps people look in the mirror, see an often uncomfortable truth, and let it change them." This may necessitate strengthening hope that change is possible and building clients' confidence in their abilities to make it happen (self-efficacy) (Bandura 1997).

3.6.2.4 Planning

Planning may proceed when ambivalence has been resolved sufficiently. Signs that the conversation may move to planning include: increased change talk; that the client has already taken some steps to change; diminished sustain talk; evidence of the client envisioning a future having changed; and asking questions of the clinician about change (Miller and Rollnick 2013). Often a summary of the change talk that has emerged followed by a 'key question' that asks what, if anything, the client wishes to do is enough to move the conversation into the planning phase.[13]

There is less process research on the planning process in MI relative to evoking, though agreeing a specific plan of action, which may involve further treatment and strengthening commitment to change are considered important components (Miller and Rollnick 2013). Action planning in MI involves clear specification of the desired outcome (goal) and the steps required to achieve it (what the person will need to do to make change happen, when and how do they plan to do this). The planning process is collaborative, with the client's ideas about how change should proceed evoked and their position as the active decision maker reinforced. Attention is paid to client

[13] The 'Elicit commitment (or leave the door open)' strategy described in the PREAMP intervention manual (Appendix L) provides an example of how to test whether the time is right to progress to planning within an engagement consultation following referral for PR. This includes conveying acceptance and willingness to discuss joining PR in the future should the person elect not to join the programme at that time.

commitment language, as well as other components of mobilising change talk since these reflect movement toward resolution of ambivalence in favour of change (Miller and Rollnick 2013).[14]

Research on planning-based interventions (outside of MI) emphasises the value of discussing the enactment of behavioural intentions (Gollwitzer 1999; Gollwitzer 2014; Hagger and Luszczynska 2014; Hagger et al. 2016). This has been prompted by the recognition that people's intentions often do not manifest in behavioural enactment, a phenomenon referred to as the intention-behaviour gap (Rhodes and de Bruijn 2013b, a). MI borrows from the implementation intentions framework (Gollwitzer 1999) that aims to bridge the intention-behaviour gap by identifying potential barriers to change and pairing this with a goal-directed response.

3.6.3 **Core skills**

The core skills emphasised within MI include asking open-ended questions, affirming, reflective listening and summaries, captured by the acronym OARS. Definitions of each skill are provided in the glossary of this thesis. The skills are used with a different purpose depending on the process. For example, reflective listening is used within the engagement process to demonstrate acceptance and build a trusting relationship (see section 3.6.2.1, page 37), whilst in evoking, reflections are used to differentially evoke and reinforce change talk (see section 3.6.2.3, page 39).

MI also involves exchanging information. A three-stage sequence described as *elicit-provide-elicit* serves to preserve engagement by honouring the client's expertise and autonomy (Miller and Rollnick 2013). This involves: ascertaining the client's interest in hearing the information, asking what they already know, or giving permission to disregard what has been said (elicit); presenting the information neutrally by referring to others' experiences or the science (provide); and then asking the client to interpret the personal meaning, or reflect their reaction if it is evident (elicit).

3.7 When does an intervention become motivational interviewing?

This section contains a justification for the focus of the thesis research on the feasibility of MI in its *pristine* form. A distinction is made between MI in its *pristine* form, 'adaptations of MI' and

[14] The PREAMP intervention manual provides examples of how action planning might proceed in a PR context. During the 'Engagement consultation' the planning focus is on supervised rehabilitation sessions (see 'Problem solve practical and psychological barriers to engagement' strategy). Within the 'Support consultation' the 'Problem-solving barriers to ongoing engagement' strategy is used flexibly based on need to address either programme engagement or unsupervised physical activity.

interventions that are labelled MI but do not contain all essential elements of the method. Intervention design is a component of treatment fidelity, which is discussed within section 3.11.1 (page 58).

As explained in the earlier section on its origins (section 3.2, page 29), MI has diffused into contexts other than specialist addiction counselling where it was conceived. This has prompted modifications to the method to make delivery easier for non-specialists who do not have prior training in counselling skills, and more feasible in settings where there is less time for training and greater time pressures within client-consultations. Early attempts by Rollnick to adapt MI for such use have been described and include '*brief motivational interviewing*' (Rollnick et al. 1992) and '*behaviour change counselling*' (Rollnick et al. 2002).

Whilst these approaches have elements in common with MI, they are not the same. For example Rollnick et al. (2002 p. 278) state "Behaviour change counselling is derived from the patient-centred method (Stewart et al., 1995), with some principles and skills linked to the more specific subject of health behaviour change (Rollnick et al., 1999) and motivational interviewing." Moreover, key features of MI such as the directive use of reflective listening and development of discrepancy are seldom evident in such adaptations. In recognition of these important distinctions, Rollnick used names other than motivational interviewing when referring to these interventions. This was driven primarily by concerns about diluting the parent method and a wish to protect the term '*motivational interviewing*' (Rollnick and Miller 1995; Rollnick et al. 2002).

Concerns about changing the content of MI seem justified. As early as 1995, Rollnick and Miller (1995) noted that descriptions of some interventions labelled as MI "bear little resemblance to our understanding of its essence, and in some cases directly violate what we regard to be central characteristics" (p. 235). The emphasis on technique without the underlying '*way of being*' prompted the authors to define MI more clearly and include spirit as an essential component of the method in their writings (Rollnick and Miller 1995; Miller and Rollnick 2009; Miller and Rollnick 2014).

It is common for trials purporting to use MI in a COPD context to be similarly limited, with reference made only to the use of "MI techniques" or being "based on the principles of MI" (for example: de Blok et al. 2006; Hospes et al. 2009; Altenburg et al. 2015). Other interventions claiming to involve MI have contained components that may have a detrimental impact on outcome (Miller and Rollnick 2014). For example, Burtin et al. (2015) described the use of a decisional balance exercise in which participants listed "benefits and costs of changing and not

changing behaviour in parallel columns." (p. 4). As Miller and Rose (2013) have noted, this can undermine commitment in people who are ambivalent about change.

Adaptations of MI may create time efficiencies in terms of intervention delivery and may reduce training requirements for providers, since the more challenging components of the parent method are often omitted. However in research, failure to distinguish between MI in *pristine* and adapted forms risks a Type III error, which is incorrectly concluding an intervention did not work when it was not implemented appropriately (Basch et al. 1985).

According to Miller and Rollnick (2014 p. 235), to constitute a legitimate test of MI, interventions should include all elements that have been empirically or theoretically linked to the efficacy and avoid practices that carry potential to undermine its effectiveness. Based on research exploring the hypothesised mechanisms of action of MI, they recommend that any MI intervention should contain:

1. A person-centred non authoritarian counselling style as originally described by Carl Rogers and his students;
2. A clearly identified change goal toward which the conversation is directed; and
3. Differential evoking and strengthening of the person's own motivations for change.

The research reported in this thesis assessed the feasibility of MI that conforms to these quality criteria. The author has used the term *pristine* to draw the reader's attention to this and to distinguish it from any derivative of MI.

3.8 Theoretical links

In contrast to the hypothetico-deductive model that underpins intervention development in modern psychology, MI was not based on psychological theory (Miller and Rose 2009; Miller and Rollnick 2012; Miller and Moyers 2017). Rather the starting point was Miller's intuitive practice in the field of alcohol treatment (Moyers 2004) (see section 3.2, page 29). Miller logically linked his experiences to several psychological theories in an effort to explain the interpersonal dynamics within an MI consultation and rationalise its effectiveness (Miller 1983).

The impact of clients hearing themselves argue for change was related to self-perception theory (Bem 1972). Bem's theory provided a useful way to think about how clients' perceptions of themselves are shaped by their own language as it emerges within an empathic interpersonal context. Festinger's formulation of cognitive dissonance as an inherently aversive drive state

(Festinger 1957) was also deemed helpful to describe the motivational energy created through 'developing discrepancy' (see section 3.6.2.3, page 39). It is noteworthy that the role of cognitive dissonance has received less attention within contemporary descriptions of MI. The authors argue that a more elegant way to understand this motivational trigger is as a discrepancy between 'present and desired states' (Miller and Rollnick 2013 p. 243) since it avoids a need to make assumptions about an aversive drive state and an inherent drive toward cognitive consistency (Miller 2009).

Miller explained that for a perceived discrepancy to be motivating, people need to believe that they can cope effectively and maintain change directed behaviour when faced with difficult situations (Miller 1983). Thus he made links with self-efficacy theory (Bandura 1997). Strengthening hope and optimism when low confidence is a barrier to change, remains a key component in modern descriptions of the method (Miller and Rollnick 2013).

Reference was also made to the transtheoretical model proposed by Prochaska and DiClemente (1983). The stages of change component of the model drew attention to the ideas that people vary in their readiness to change behaviour, and that many of those encountered in practice are not yet ready to take action. The model implied a need to address people differently based on their readiness and Miller (1983) indicated that it provided a way to describe the function of MI, particularly its role in building motivation and commitment for change. Miller and Rollnick (2009) have since pointed out the misconception that MI was *based* on the transtheoretical model. In the most recent edition of the MI text, little reference is made to it beyond a description of its place in the evolution of MI and its conceptual similarity (Miller and Rollnick 2013). Reports of fundamental flaws with the transtheoretical model (Sutton 2001; West 2005) may have contributed to the distancing.

Although MI has several intellectual influences (Moyers 2004), the strongest has been Rogers' client-centred therapy (Rogers 1959). Miller and Moyers (2017) have described MI as an evolution of Rogers' approach with the 'necessary and sufficient conditions' representing an ideal context in which to explore ambivalence and access the person's own arguments for change. The emphasis on a 'way of being' that prizes acceptance and optimism regarding people's inherent motivation for betterment and capacity for change borrows directly from Rogers' approach (Rogers 1980).

A key principle in MI is to avoid practices that can trigger client defensiveness and arguments against change, such as giving unsolicited advice and planning for action before the client is

ready. Miller and Rollnick (1991)[15] drew on the theory of psychological reactance to provide theoretical support for this. Psychological reactance is the predictable emotional and behavioural response that occurs when an individual perceives a threat to their autonomy (Brehm and Brehm 1981).

More recently, de Almeida Neto (2017) has argued that psychological reactance describes, but does not explain, why people do not readily submit to pressure or advice to change behaviour even when it is in their best health interests. He proposed that such behaviour patterns reflect a biological adaptation that evolved in our ancestral past to facilitate group cohesiveness and functioning. Acting contrary to, or ignoring recommendations, conveys "social dominance information to potential social adversaries" (p. 382), which serves to maintain one's position in the social hierarchy and thereby preserves reproductive opportunities and access to resources (food, shelter, clothing).

According to de Almeida Neto (2017) this biologically primed tendency to behave contrary to direction from others operates outside conscious awareness and has evolved to become decontextualised and "active in any situation in which humans sense they are in a position of power" (p. 384). In clinical practice, the act of suggesting to a client that they should change a behaviour may be framed as a dominance struggle, since in making the recommendation, the clinician is asserting a higher social-hierarchical position (de Almeida Neto 2017; Miller 2017). Moreover, the clinical context provides cues regarding the expectation for the client to conform to expert advice, which may sensitise the social dominance regulatory system and thereby amplify the reactance tendency. In behaviour change the client is the ultimate decision-maker and in the service of challenging the social aggressor (clinician) they may employ one of three strategies; counter-attack (argue against change), yield (comply with the recommendations so long as the pressure is maintained), or retreat (to withdraw from treatment) - none of which support sustained change (de Almeida Neto 2017). So, whilst this non-consciously primed behaviour was "adaptive in the human ancestral past it is considered dysfunctional in the context of behaviour modification" (de Almeida Neto 2017 p. 384).

De Almeida (2017) contends that MI may work because the autonomy respecting, empathic style communicates respect, caring and support, and thereby enhances the client's perceptions of social-hierarchical and physical safety. The emphasis in MI on the spirit as a way of being with clients, as opposed to a set of techniques used to manipulate them (Miller and Rollnick 2009), also

[15] The link to psychological reactance was not explicit in Miller's original paper.

reinforces the client's perception of control and reduces the reactance tendency. When clients experience the clinician and the interaction in this way, de Almeida Neto (2017) posits that activation of the amygdala (the part of the brain that initiates the fight or flight response) decreases and higher order cognitive processes involved in thought, reasoning and planning become more influential. Thus, the goal of the engagement process in MI is to establish and maintain a trusting relationship in which the client feels accepted as they are and free from controlling pressures. When the client's need for psychological safety is satisfied, they are less inclined to respond instinctually and better positioned to think about their ambivalence in a rational and considered way and ultimately resolve it.

It has been suggested that a 'natural fit' exists between MI and self-determination theory (SDT) (Ryan and Deci 2000) with the three psychological needs that are foundational to SDT (relatedness, competence and autonomy) also addressed in the principles and practice of MI (Miller and Rollnick 2012). It has been argued that SDT might benefit MI by clarifying the conditions and processes underlying its effectiveness (Vansteenkiste et al. 2012). For example, it has been proposed that SDT provides a nuanced conceptualisation of the motivation that MI seeks to promote[16] and a finer differentiation of change talk in terms of motivation (Markland et al. 2005; Vansteenkiste et al. 2012). This in turn may be used to help make sense of inconsistent findings where they occur, and support ongoing efforts to refine and improve elements of its practice (Vansteenkiste et al. 2012). In section 7.2.1 (page 172), SDT has been used to make sense of the variable engagement and suboptimal adherence to physical activity recommendations that is commonly observed in PR.

In summary, MI originated through attempting to solve practical problems in clinical practice. Whilst attempts have been made to link the method retrospectively to psychological theories, with the exception of Rogers' work, it was not developed, or guided by them. Miller and Rollnick (2012) assert that instead of proposing an underlying theory of treatment or change, their ongoing efforts to understand how MI works has continued to take the approach of "deriving intuitive hypotheses from clinical experience, submitting them to the verification of scientific method and then going back to the drawing board to try again." (p.1). This has led to the development of several hypotheses regarding the mechanisms of action of MI that are discussed in the next section.

[16] Section 7.2.1 contains a description of the different types of motivation described within SDT, with links made to the problem of sub-optimal engagement programmes and poor adherence to physical activity recommendations associated with traditional PR programmes.

3.9 Mechanisms of action

Three hypotheses about how MI works have been proposed: a technical hypothesis, a relational hypothesis and a conflict resolution hypothesis (Miller and Rose 2009; Arkowitz et al. 2015; Magill and Hallgren 2019). These are depicted in Figure 3-1. Several systematic reviews summarising MI process research have been published (Apodaca and Longabaugh 2009; Magill et al. 2014; Copeland et al. 2015; Romano and Peters 2016; Pace et al. 2017; Magill et al. 2018a). Magill et al. (2018a) summarised the largest number of studies (*n*=36) and found some support for the causal chain.

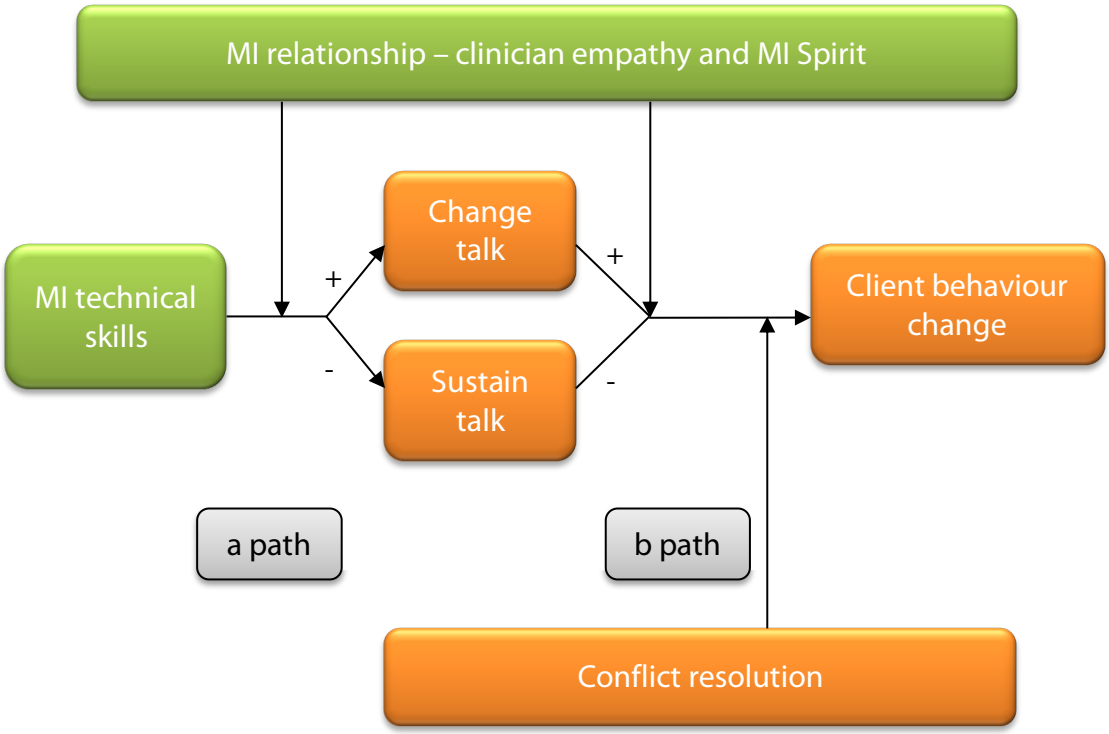


Figure 3-1. Hypothesised relationships among processes and outcome variables in motivational interviewing.
Adapted from "Mechanisms of behaviour change in motivational interviewing: Do we understand how MI works?" by M Magill and KA Hallgren (2019) *Current Opinion in Psychology* 30: 1-5.

3.9.1 The technical hypothesis

The technical hypothesis focuses on client language. It is hypothesised that when clients voice change talk within an empathic, autonomy respecting relationship, they become more committed

to that side of their ambivalence and the probability of behaviour change increases. Conversely, sustain talk decreases the likelihood of change as clients hear themselves defending the status quo. This implies a need to differentially elicit and reinforce change talk and avoid those behaviours such as giving unsolicited advice and confronting clients about the need for change that can trigger sustain talk. Responding to sustain talk when it does emerge in a way that avoids reinforcing or prolonging it is also indicated (Miller and Rose 2009; Miller and Rollnick 2013).

Consistent with the technical hypothesis, Magill et al. (2018a) reported that the frequency of clinician MI-consistent behaviours (such as affirming, emphasising control, advising with permission, raising concerns with permission, asking open questions and reflective listening) correlated with a higher frequency of client change talk (r= .55; 95% CI: 0.49, 0.60; p< .001) (shown as the (a)-path in Figure 3-1, page 47). Somewhat surprisingly, MI-consistent behaviours were also associated with the frequency of sustain talk (r= .40; 95% CI: 0.32, 0.48; p< .001). This has been reported in other reviews (Magill et al. 2014; Romano and Peters 2016; Pace et al. 2017) and is at odds with the hypothesised relationship. These analyses, however, are based on frequency counts of all behaviours subsumed by the MI-consistent category without regard for the strategy that underpins their use. When clients are struggling or becoming defensive, it would be appropriate to use MI-consistent skills to communicate acceptance and empathy (by reflecting sustain talk, emphasising autonomy and acknowledging choice). As client engagement allows, the clinician would transition to using MI-consistent strategies to differentially reinforce change talk and work toward resolving ambivalence.

More sophisticated analyses that preserve the temporal relationship between clinician and client utterances reveal that there is a greater probability that MI-consistent behaviours will be immediately followed by client change talk than sustain talk (Moyers et al. 2007; Gaume et al. 2008b; Moyers et al. 2009) which is more in keeping with the theory. Magill et al. (2018a) found when clinician skills and client language were analysed as proportions rather than as frequencies, the hypothesised causal chain was supported. Specifically, the proportion of MI skills that were MI-consistent was positively associated with the proportion of client language that was change talk (r= .11; 95% CI: 0.03, 0.18; p< .01).

The technical hypothesis also posits that clinician MI-inconsistent behaviours (for example confronting the client about the need for change, warning and advising without permission) will be associated with client sustain talk. Magill et al. (2018a) found support for this relationship (r= .16; 95% CI: 0.08, 0.24; p< .001). Of note, most of the reviewed studies involved highly trained counsellors and employed strict quality control procedures to maximise the integrity of MI delivery

and consequently the incidence of MI-inconsistent behaviours was low. Despite this, a significant association with sustain talk was observed.

The technical mechanism of MI hypothesises that client in-session language will predict subsequent behaviour change, shown as the (b) path in Figure 3-1 (page 47). Magill et al. (2018a) reported that whilst sustain talk was associated with worse outcomes as expected (r= .19; 95% CI: 0.15, 0.24; p< .001), change talk was not associated with better outcomes (r= -.01; 95% CI: -0.06, 0.06; p> .05), a finding also reported by Pace et al. (2017). It was only when change talk was considered as a proportion of client talk and sustain talk that a relationship was found (r= -.16; 95% CI: -0.22, -0.10; p< .001).

It is not clear from this research whether change talk is a weak determinant, or the poor prognostic value relates to the way it is typically measured. Most analyses are based on frequency counts of change talk over the entire session without regard for its pattern, trajectory or strength and as such they fail to capture what are considered the important underlying goals and processes of MI (Miller and Rose 2009). More nuanced analysis of client language during MI within a trial targeting drug use problems provides support for this assertion (Amrhein et al. 2003). Using a taxonomy to measure the strength and valence of different categories of change talk (positive instances representing arguments in favour of change; negative instances indicating language in favour of the status quo) the researchers reported that only the pattern of commitment strength was associated with abstinence from drug-use at follow-up. Specifically, a positive slope of commitment strength over the course of the session predicted outcome with the strongest predictor being the strength in the latter portion of the session when a change plan was discussed. Whilst the mean strength of other change talk categories (desire, ability, reason and need for change) were all associated with the strength of commitment language, they did not independently predict drug-use at follow-up. This finding has been replicated by others (Hodgins et al. 2009).

Most understanding about the mechanisms of action of MI is based on small scale studies that have examined separate links in the causal chain for example measuring client language as an outcome rather than as a mediating variable within the pathway. Notable exceptions exist where MI has been used to address alcohol consumption, drug use and modify diet and exercise (Moyers et al. 2009; Vader et al. 2010; Pirlott et al. 2012; Barnett et al. 2014). As Moyers et al. (2017) have noted, whilst these mediation studies provide stronger support for impact of client language, their correlational designs do not rule out the possibility that client language could be an indication of a different underlying process. They argue that clients who are already motivated to take action may be more likely to share positive thoughts about change, whereas those who are less ready, justify

their current behaviour and explain why change may be difficult. In this sense, client language signals the level of motivation, but their language does not influence it (p. 44). Experimental research showing that change talk can be experimentally manipulated supports the argument that client language exists in the causal pathway (Glynn and Moyers 2010; Moyers et al. 2017). Glynn and Moyers (2010) used a within subject research design in which clinicians switched between two different counselling styles every 12-minutes within a counselling session. Change talk increased reliably during those segments in which clinicians attempted to evoke and reinforce it and decreased when clinicians employed a more neutral counselling style.

3.9.2 **The relational hypothesis**

The relational hypothesis relates to the quality of the therapeutic relationship and is founded on the client-centred approach developed by Carl Rogers. In MI, this manifests primarily through the humanistic 'spirit' which involves supporting client autonomy, encouraging collaboration (avoiding the expert role) and communicating acceptance of the client as they are (Miller and Rollnick 2013; Miller and Moyers 2017). A key component of acceptance is accurate empathy, which refers to a clinician's attempt to understand a client's experience and meaning and involves reflective listening statements that communicate their understanding (Truax and Carkhuff 2008). This style of working is thought to provide a safe therapeutic climate in which clients feel comfortable exploring their ambivalence without fear of judgment and pressure to change (Miller and Rollnick 2013). In keeping with the underlying theory of client-centred counselling, people naturally move in the direction of positive change when provided with these conditions of support (Rogers 1959, 1980).

Experimental studies have provided support for the (a) path element of the relational hypothesis shown in Figure 3-1 (page 47). Relative to a confrontational approach, an empathic style is more likely to result in patterns of client in-session speech that are prognostic of behavioural outcomes (Valle 1981; Miller et al. 1993; Gaume et al. 2008a) and superior client involvement during treatment sessions (Moyers et al. 2005b; Boardman et al. 2006). However, Magill et al. (2018a) did not find evidence to support the (b) path element of the relational hypothesis (specifically that MI spirit and empathy will predict client behaviour change at follow-up). The pooled correlation coefficient for MI spirit was negative and non-significant (r= -.04; 95% CI: -0.09, 0.17; p> .05) as was that for empathy (r= -.04; 95% CI: -0.08, 0.18; p> .05). These findings are at odds with reviews that evidence the value of relational factors in psychotherapy more generally (Elliott et al. 2011; Norcross and Wampold 2011). One possible explanation raised by Magill and Hallgren (2019) relates to the narrow range of clinician skills evident across reviewed studies (MI spirit 4.2 ±0.8;

empathy 4..3 ±0.8, based on 1-5 Likert scale). Most were efficacy trials employing highly trained counsellors with tight quality controls to maximise treatment integrity. Primary studies in which there is a greater range of relational skills have supported the relationship between empathy and client outcomes (Moyers et al. 2016a).

3.9.3 The conflict resolution hypothesis

The conflict resolution hypothesis predicts that behaviour change is triggered through the exploration and resolution of ambivalence (Arkowitz et al. 2015). In light of the review level finding that change talk is predictive outcome only when it is considered in combination with sustain talk (Magill et al. 2018a) it has been argued that the ambivalence and conflict resolution are important constructs to consider when exploring mechanisms of action of MI (Magill et al. 2018a; Magill and Hallgren 2019). As Magill and Hallgren (2019) have pointed out, this idea has received less empirical attention than the relational and technical hypotheses, despite MI's explicit focus on resolving ambivalence. They add that this may reflect difficulties measuring such a dynamic construct.

The client self-exploration component of the Motivational Interviewing Skill Code (2.1) (Miller et al. 2008) measures the depth of intra-personal processing achieved during MI. Higher levels occur when clients are actively engaged in the conversation and discuss values, problems, feelings, fears, life-choices and self-perceptions (p.12), which may reflect important element of the exploration and resolution of ambivalence, and there is some support for its predictive validity (Apodaca et al. 2014; Borsari et al. 2015).

3.9.4 Summary of the evidence for the three hypotheses of how motivational interviewing works

Overall, there is support for the causal pathway hypothesised in Figure 3-1 (page 47), with process research revealing links between clinician behaviours, client in-session language and subsequent behaviour change. The strongest support is for the (a) path element of the model. The technical and relational skills that characterise MI are well defined, and studies have shown links between a clinician's use of these skills and client in-session response (for example change talk, involvement).

The (a) path element of the technical hypothesis has been most widely evaluated (Magill and Hallgren 2019). Studies have shown that it is possible to influence the way in which clients talk about their ambivalence and behaviour change, with evidence that a greater proportion of

clinician MI-consistent skills are associated with a greater proportion of client change talk relative to sustain talk.

There is also evidence for the (b) path element of the model, with a greater proportion of change talk predicting behaviour change outcomes at follow-up, although the findings have been less consistent. Magill and Hallgren (2019) have offered several possible reasons to explain the relative difference in the state of evidence for the (a) and (b) paths. They argue that the link between client in-session language and post-MI behavioural outcomes is "inherently more challenging to detect" (p. 3) given they are temporally distant, different in form (verbalised commitment and intentions versus behavioural outcomes), and assessed using different methods (observer coding versus self-report). Moreover, they assert that detecting a link between what happens during MI and the client's subsequent behaviour is particularly challenging given the influence of a host of personal, social and environmental factors on behaviour change.

Although mechanisms research has provided insights as to why and how MI works, there are still important gaps that need to be addressed. Most understanding is based on research within the field of addictions (drug, alcohol and gambling) with only a small amount of work focused on health behaviour change (Pirlott et al. 2012; Copeland et al. 2015; Riegel et al. 2016). It is possible that the relative influence of each active ingredient will differ across contexts (for example psychotherapy sessions may differ from those in healthcare), whether the target of MI is the cessation of unhealthy behaviour (excessive alcohol, smoking) or adoption of a new behaviour (physical activity, exercise) and whether the client is help-seeking, recruited opportunistically or their attendance is mandated. It is also noteworthy that mechanisms research has most commonly involved MI as a standalone intervention rather than in combination with other interventions. The mediation pathways may be different where MI is used as a motivational adjunct to increase engagement and adherence with another intervention (Romano and Peters 2016) and it may be that ambivalence does not need to be resolved to the same degree to enhance engagement with a partner intervention.

Future research in this area will need to refine understanding of the proposed mechanisms across contexts and applications and also consider alternative mechanisms that may account for additional portions of the variance in the efficacy and effectiveness of MI (Magill et al. 2018a). One way this may be achieved is to draw on sophisticated technological advancements such as those proposed by Atkins et al. (2014) that involve computer coding of interventionist fidelity. This may make larger scale studies exploring mechanisms of action more viable (Magill and Hallgren 2019).

3.10 Critique of motivational interviewing

More than 1,300 controlled trials have been published testing the efficacy and effectiveness of MI across a variety of contexts and problem areas.[17] Numerous systematic reviews, many with meta-analysis have reported modest effects of MI (Burke et al. 2003; Hettema et al. 2005; Rubak et al. 2005; Lundahl et al. 2010; Jensen et al. 2011; Chilton et al. 2012; Macdonald et al. 2012; Naar-King et al. 2012; Hill et al. 2013; Lundahl et al. 2013; Vanbuskirk and Wetherell 2013; Gayes and Steele 2014; McGrane et al. 2014; O'Halloran et al. 2014; Purath et al. 2014; Ren et al. 2014; Riper et al. 2014; Kohler and Hofmann 2015; Morton et al. 2015; Lee et al. 2016; Lawrence et al. 2017; Randall and McNeil 2017; Frost et al. 2018; Soderlund 2018; Lindson et al. 2019). Average effect sizes are in the small to moderate range with the largest effects generally observed when MI is used to address drug and alcohol problems, although it does not appear to be effective in all problem areas (Lundahl et al. 2010; Lundahl et al. 2013; Frost et al. 2018). When delivered as a standalone treatment, MI generally outperforms 'weak' comparisons such as no treatment, written materials or non-specific treatment as usual, but is no more effective than other viable treatments such as cognitive behaviour therapy (CBT) (Lundahl et al. 2010). This is consistent with the general finding in the psychotherapy literature that established treatments are approximately equal in effectiveness (Wampold et al. 1997).

There is some evidence that MI is more efficient than other proven interventions (Burke et al. 2003; Lundahl et al. 2010). In large multi-site, randomised controlled trials (RCTs) testing treatments for substance use disorders, MI has been as effective as more extensive interventions including CBT, but more efficient, taking less clinician time to effect change (Project MATCH Research Group 1997, 1998; UKATT Research Team 2005a, b). This gives indications of cost-effectiveness, though as Frost et al. (2018) have noted, a dearth of health economic data in the literature prevents conclusions from being drawn at this time. Whether an increase in the dose (number/duration of sessions) and intensity (reduced spacing between sessions) of MI delivered would increase its effectiveness relative to other proven interventions remains an important area for further research (Polcin et al. 2015; Madson et al. 2016).

The outcomes of published MI research need to be viewed with caution. One issue is the high degree of variability in the effects of MI across problem areas, studies, sites and clinicians, much of which remains unexplained (Miller and Rollnick 2013; Miller and Moyers 2017). Several well-conducted RCTs have failed to show an effect of MI (for example Heisler et al. 2012). Multi-site trials

[17] https://motivationalinterviewing.org/mi-controlled-trials-list-miller-2020.

have also shown significant effects in some sites but not others (Carroll et al. 2006; Ball et al. 2007; Winhusen et al. 2008; Carroll et al. 2009) despite attempts to standardise treatments. The variability in outcomes has led Frost et al. (2018) to conclude that there is a "discrepancy between the wide-spread recommendations of Motivational Interviewing as a universal behaviour change strategy and the available evidence supporting its use" (p. 29). Calls have been made for research that advances understanding about the conditions under which MI is effective (Madson et al. 2016).

Miller and Moyers (2017) have posited that some of the variability observed in MI outcome research may be due to differences in the treatment delivered. Provider skill and dose of MI are key components of treatment fidelity which, as described in section 3.11 (page 56), refers to the "methodological strategies used to monitor and enhance the reliability and validity of behavioural interventions." (Bellg et al. 2004 p. 443). Early MI studies in particular, were characterised by a failure to report treatment fidelity, leading Rollnick (2001) to question what was actually delivered. Despite calls to address this (Breckon et al. 2008; Miller and Rollnick 2014), the literature is still hampered by inadequate fidelity reporting, use of interventions that claim to be MI yet do not conform to Miller and Rollnick's description, and/or delivery with a level of skill below basic competency (Frost et al. 2018).

Another issue is that knowledge regarding the mechanisms of action of MI is still in its infancy. Process research linking clinician in-session behaviours with client outcomes has highlighted relational and technical mechanisms as active ingredients of MI (see section 3.9, page 47), which has informed the development and refinement of fidelity coding systems (Moyers et al. 2016b). However, it is likely that there are unidentified components of practice that influence client outcomes (Magill et al. 2018a), which are not measured by current fidelity measures.

There is some evidence that use of a manual can undermine effectiveness with one meta-analysis reporting smaller effect sizes with manual-guided MI (Hettema et al. 2005). As described in section 3.11.1 (page 58) attempts to standardise treatments often result in an excessive focus on technical matters and practical steps for implementation, at the expense of the interpersonal essence that is important for treatment outcomes (Miller and Moyers 2015).

Variation in effectiveness may also depend on how MI is used. As described in section 3.5 (page 33), in addition to being used as a standalone intervention, MI may operate as an adjunct to other active treatments. When delivered prior to, alongside or integrated within the partner intervention, attendance and engagement often improve, as does long-term treatment outcome (Burke et al. 2003; Hettema et al. 2005; Lawrence et al. 2017; Randall and McNeil 2017). In many of

these studies, participants were randomised to receive MI or no MI prior to another active treatment. The size of effect is often larger and more durable than those observed in studies where MI is compared with no treatment or usual care. This implies a synergistic effect whereby the efficacy of both MI and the treatment itself are enhanced when combined (Miller and Rose 2009). Caution is warranted in the interpretation of these findings, however, since many of the studies lacked an attentional control, and a superior effect of this particular application of MI has not always been reported (Lundahl et al. 2010).

Contextual factors may also influence the efficacy and effectiveness of MI. For example in studies testing the use of MI as a prelude to treatment for mental health problems, Lawrence et al. (2017) found an effect on treatment uptake in studies involving non-treatment seeking participants (such as those previously refusing treatment or identified through a screening programme), but not in those involving participants already seeking treatment. This differential response accords with the finding that people who are ready for change tend not to benefit from MI (at least not the evoking process designed to resolve ambivalence), and that relative to more action-oriented approaches such as CBT it may hamper their improvement (Project MATCH Research Group 1997; Rohsenow et al. 2004; Miller and Rollnick 2009).

As described at the beginning of this section, the effect of MI varies across behavioural domains and problem areas. The strongest evidence has been in the field of addictions where it developed, but it has diffused into many other areas, often ahead of empirical support. In a systematic review of reviews of research into the effect of MI on adult behaviour change, Frost et al. (2018) concluded that for studies evaluating the impact of MI for promoting healthy behaviour for specific problems, most of the evidence is inconclusive or of a low quality.[18]

Whilst the true effect of MI on behavioural adoption remains unknown, there are theoretical reasons to believe that outcomes for behaviours such as physical activity may be inferior to those observed in the treatment of addictions. Abstaining from an addictive behaviour often involves a discrete quit day, whereas being physically active entails making repeated decisions about whether to engage in the behaviour (Resnicow et al. 2002b). The factors that relate to each of those decisions, such as the weather, competing time demands, fatigue, and mood, are liable to change, meaning that ambivalence may need resolving prior to each bout of activity. This may mean relapse is more likely, particularly if the prospect of a life-long struggle to sustain physical activity is perceived to be excessively burdensome.

[18] See also scoping review on the effectiveness of MI for increasing physical activity as part of pulmonary rehabilitation (section 4.2).

Moreover, as Resnicow et al. (2002b) have argued, modifying addictive behaviour carries a greater depth of psychological meaning relative to non-addictive behaviours and the perceived consequences of relapse may be more threatening to self-image. Resolving ambivalence involves considering the negative consequences of change such as the need for alternative means of coping and managing withdrawal. By contrast, decisions to change behaviours such as physical activity may not require the same depth of self-exploration. Whilst this means it may take longer to arrive at a decision to change additive behaviour, the psychological work involved may result in stronger, more enduring levels of commitment. Furthermore, the consequences of missing a planned bout of physical activity are less tangible than those experienced after a relapse in addictive behaviour, which maybe more personally felt. There are also fewer immediate negative consequences to prompt increased self-regulation of behaviour. Therefore, whilst MI may be helpful for prompting the initiation of physical activity, additional on-going support may be required to maintain the behaviour.

3.11 Considering treatment fidelity

In the previous section, attention was drawn to the large variability in the effects of MI among trials, research sites and clinicians. Some of this, it was argued, may be attributable to treatment fidelity issues. This section therefore contains a definition of treatment fidelity and consideration of the different components as they relate to the research contained within this thesis.

Treatment fidelity has been defined as the "methodological strategies used to monitor and enhance the reliability and validity of behavioural interventions. It also refers to the methodological practices used to ensure it reliably and validly tests a clinical intervention." (Bellg et al. 2004 p. 443). Several guidelines describe treatment fidelity as an important consideration when developing, evaluating and reporting complex interventions such as MI (Craig et al. 2008; Michie et al. 2009; Hassan 2015).[19]

The National Institutes of Health Behaviour Change Consortium (BCC) developed a framework for enhancing (Bellg et al. 2004) and evaluating (Borrelli et al. 2005; Breckon et al. 2008; Borrelli 2011) treatment fidelity in behaviour change intervention research. The framework provides recommendations for best practice across five components (study design, provider training,

[19] See section 5.2 for a definition and description of complexity and a justification for treating MI as a complex intervention.

treatment delivery, treatment receipt and treatment enactment) (Bellg et al. 2004; Borrelli 2011) which are shown in Table 3-2 (page 57).

Bellg et al. (2004) argue that there are several reasons to consider treatment fidelity when designing and evaluating studies of behavioural interventions. Where significant effects of an intervention are found, but fidelity was not measured and optimised, it is not possible to conclude whether the positive outcome was due to an effective intervention, or because other factors were inadvertently added to it by providers. Conversely, in the absence of confirmed treatment fidelity, it will not be clear whether null findings are the result of an ineffective intervention or poor fidelity. The assessment of treatment fidelity, therefore, enables stronger conclusions to be drawn with regard to the impact of an intervention. The results of fidelity assessment can also be used as covariates in statistical analysis of treatment effects to better understand the impact of variables such as provider skill and intervention receipt on client outcomes. The remainder of this section is focused on describing the key components of the BCC framework as they relate to MI.

Table 3-2 *Components of Treatment Fidelity*

Component	Goal
Design of study	Ensure same treatment dose within conditions Ensure equivalent dose across conditions Plan for implementation setbacks
Provider training	Standardise training Ensure provider skill acquisition Minimise 'drift' in provider skills Accommodate provider differences
Delivery of treatment	Control for provider differences Reduce differences within treatment Ensure adherence to treatment protocol Minimise contamination between conditions
Receipt of treatment	Ensure participant comprehension Ensure participant ability to use cognitive skills Ensure participant ability to perform behavioural skills
Enactment of treatment skills	Ensure participant use of cognitive skills Ensure participant use of behavioural skills

Adapted from "Enhancing treatment fidelity in health behaviour change studies: Best practices and recommendations from the NIH Behaviour Change Consortium" by AJ Bellg, B Borrelli, B Resnick, J Hecht, DS Minicucci, M Ory, G Ogedegbe, D Orwig, D Ernst and S Czajkowski (2004). *Health Psychology* 23(5): 443-451.

3.11.1 **Intervention design**

Treatment fidelity applied at the design stage seeks to ensure that the study is capable of answering the research questions in relation to underlying theory and procedures (Bellg et al. 2004). This includes specification of the content of the proposed intervention and its active ingredients together with careful consideration of the relationship between intervention and control conditions to avoid confounding of treatment effects. The issue of intervention content was introduced in section 3.7 (page 41) of this thesis. Following Miller and Rollnick (2014), it was argued that to constitute a legitimate test of MI, an intervention should contain all elements that are known to be active ingredients (referred to in this thesis as MI in its *pristine* form): it is not enough to simply label an intervention as MI.

Recent theoretical and empirical advances in the development and evaluation of complex interventions indicates a need to avoid excessive standardisation of an intervention since this may undermine effectiveness. Rather the goal should be to allow a degree of tailoring to suit local circumstances without undermining its function (Miller and Rollnick 2014; Hawe 2015; Sermeus 2015). Process research elucidating the mechanisms of action of MI can be used to inform which, and to what extent, elements can be adapted without undermining efficacy (Miller and Rose 2009; Magill et al. 2018a).

The use of intervention manuals is considered a valuable component of intervention fidelity, although as discussed in section 5.2.3 (page 127) in the context of complex intervention design, manuals carry the potential to reduce provider flexibility and promote mechanistic application of skills. At least one meta-analysis has shown worse outcomes in studies involving manualised MI (Hettema et al. 2005). Balancing technical information and practical steps, about how to proceed with more abstract information that communicates the essence of the approach and underlying spirit, is therefore important (Safran and Muran 2000; Miller and Rollnick 2014).

3.11.2 **Provider training**

This fidelity component involves providing sufficient training to ensure those responsible for delivery achieve a pre-defined criterion of skill (Miller and Rollnick 2014). Direct coding of observed practice is considered the most valid and reliable way to assess provider skill (see Appendix K, page 391 for a detailed discussion). Validated systems such as the Motivational interviewing Treatment Integrity code (MITI) (Moyers et al. 2010; Moyers et al. 2015) exist to assess constituent skills, for which basic competency thresholds have been proposed (Moyers et al. 2010; Moyers et al. 2016b).

Consideration is given in the BCC framework to provider differences in the skill acquisition through training (Bellg et al. 2004). This is particularly relevant to MI as the amount and type of input required to achieve competency is known to vary across individuals even when training is standardised (Imel et al. 2014) and some do not achieve such levels even with intensive training (Miller et al. 2004; de Roten et al. 2013; Miller and Moyers 2016). For additional detail the reader is referred to section 4.4 (page 98) that contains a review of evidence for the effectiveness of MI training for health professionals and to Appendix B (page 327), which contains a summary of training input and post-training skills reported as part of fidelity assessment within MI-based studies in health contexts.

3.11.3 **Delivery of treatment**

Treatment delivery refers to processes used to ensure the intervention is delivered as intended. This has been referred to as treatment integrity (Vermilyea et al. 1984), which is a function of provider skill and adherence to an intervention's key principles. In MI it involves documenting actual skill levels achieved using validated measures such as the MITI and confirming inter-rater reliability. To reduce selection bias it has been recommended that all trial sessions are audio-recorded, with a proportion of each providers' sessions at each phase of an intervention selected at random for assessment (Jelsma et al. 2015).

To minimise 'drift' in treatment integrity there should be mechanisms to address sub-threshold performance. Ideally, providers should be prevented from treating further trial participants until additional training has been completed and adequate performance has been re-established (Miller et al. 2005). As Miller and Rollnick (2014) note, however, procedures are seldom implemented or reported adequately in clinical trials.

Another consideration is dosage, which includes both the amount of MI actually delivered and the spacing between sessions (Miller and Rollnick 2014). Given their potential relationship with treatment outcome, both aspects of dosage should be documented and reported.

Fidelity strategies applied at the delivery stages also involve ensuring intervention and control conditions are differentiated. This involves minimising contamination, especially when the same provider delivers treatment and control interventions.

3.11.4 **Receipt of treatment**

The receipt component focuses on the client. In the context of MI, receipt refers to evidence that the client's in-session language suggests an increased level of motivation and commitment to

change. The Motivational Interviewing Skill Code (MISC) (De Jonge et al. 2005; Miller et al. 2008) is a validated measure of client in-session response to MI, from which the MITI was derived, which can be used for this purpose. The Client Evaluation of Motivational Interviewing (CEMI) (Madson et al. 2009a; Madson et al. 2013; Madson et al. 2015) is a validated, self-administered measure that assesses clients' perception of the extent to which the MI provider exhibited MI-consistent behaviours during their most recent session. The results can be used to augment the observer ratings provided by the MISC.

3.11.5 **Enactment of treatment skills**

Monitoring of treatment enactment involves measuring the extent to which the behavioural and cognitive strategies taught during treatment are applied in real-life settings (Bellg et al. 2004). This conceptualisation does not align well with MI. Whilst self-regulatory strategies may be discussed during the planning process, there is no reliance on education or skills training. Instead, clients are viewed as active problem solvers capable of developing their own self-management strategies and refining them over time. The emphasis is on resolving ambivalence, thereby triggering autonomous self-regulation of behaviour.

The BCC distinguishes between enactment and treatment adherence, the latter referring to the extent to which the person "performs the tasks definitive of medical treatment or a healthy lifestyle change" (Bellg et al. 2004 p. 449). In light of the point above it would be possible to have poor enactment but excellent treatment adherence: following experimentation, the person substitutes provisionally agreed cognitive or behavioural strategies, with others that better suit their preferences and circumstances (Leventhal and Friedman 2004).

3.12 Conclusion

In this chapter there has been a description of the origins, purpose and method of MI. The theories that have been logically linked to MI have been described and process research testing its hypothesised mechanism of action, critically evaluated. This chapter has also provided a critique of MI, which drew attention to the large variability in its effects among trials, sites and providers. Some of this variability may be attributable to the MI intervention actually delivered, with the specific content of the intervention, provider skill, and dose of MI representing key treatment fidelity issues that appear to influence outcomes.

The large variability in the effect of MI across behaviours and settings means that is important to examine context specific research when making judgments about the potential impact of a novel

application, such as that proposed within this thesis. In the next chapter, therefore, there is a scoping review of relevant research testing the effectiveness of MI for promoting physical activity. There is also a section on learning MI and a scoping review of research testing the effectiveness of MI training for health professionals.

Chapter 4: Motivational interviewing - evidence reviews

4.1 Introduction

The use of motivational interviewing (MI) as an adjunct to pulmonary rehabilitation (PR) to promote engagement and adherence to physical activity recommendations is a relatively novel application. To enable judgements regarding its potential, the author completed a scoping review of relevant research testing the effectiveness of MI for promoting physical activity. A scoping review "provides a preliminary assessment of the potential size and scope of available research literature. It aims to identify the nature and extent of research evidence." (Grant and Booth 2009 p. 101). The results of this review are presented in section 4.2.

There is evidence to suggest that outcomes of MI are moderated by the skill with which it is delivered, but also that MI can be challenging to learn and deliver as intended. Therefore, section 4.3 contains a review of research evaluating different forms of training on skill acquisition and a consideration of models that may be used to guide training development and evaluation. The writing draws attention to theoretical and empirical arguments that physiotherapists and nurses, who are the primary providers of PR in the United Kingdom National Health Service (UK NHS), may be at a disadvantage for acquiring MI skills relative to other professional groups, particularly those with psychology or counselling backgrounds. Because the thesis research is focused on the feasibility of MI delivered by PR clinicians, the author completed a second scoping review of research testing the effectiveness of MI training for health professionals. The results are reported in section 4.4. The chapter concludes with a discussion of how the overarching research questions for the research contained in this thesis emerged from the evidence reviews.

4.2 Scoping review: The effectiveness of motivational interviewing for increasing physical activity as part of pulmonary rehabilitation

Within this section is a scoping review of evidence for the use of MI to promote adherence to physical activity recommendations as part of PR. An initial search of evidence for the use of MI as an adjunct to PR to promote physical activity, failed to identify any systematic reviews (with or without meta-analysis) but did indicate there were several primary studies. Therefore, the decision

was taken to establish whether there was any review level evidence of effectiveness of MI interventions for physical activity in any chronic disease population, and then to examine the primary studies where MI has been used in the context of PR. Table 4-1 contains a summary and justification for the focus of the two components of the review.

Table 4-1 *Summary of Scoping Review of the Effectiveness of Motivational Interviewing (MI) to Promote Adherence to Physical Activity Recommendations as part of Pulmonary Rehabilitation (PR)*

Review question	Level of evidence	Detail and justification
Is MI effective for increasing physical activity, cardiorespiratory fitness or functional exercise capacity in adults who have non-communicable chronic disease?	Systematic review	Initial search for use of MI as an adjunct to PR failed to identify any systematic reviews. The decision was made to establish whether there was any review level evidence investigating the effectiveness of MI interventions for physical activity in any chronic disease population.
Does evidence from RCTs indicate that MI is effective for increasing physical activity, cardiorespiratory fitness or functional exercise capacity in adults with COPD referred for PR?	Primary research	The systematic reviews identified did not include any studies in which MI has been used as an adjunct to PR. A review of primary studies was deemed necessary to enable judgments about this novel application.

Note. COPD = Chronic Obstructive Pulmonary Disease; RCT = randomised controlled trial.

4.2.1 Systematic review level evidence

4.2.1.1 Review question

Is MI effective for increasing physical activity, cardiorespiratory fitness or functional exercise capacity in adults who have non-communicable chronic disease?

4.2.1.2 Search strategy

This involved a search for systematic reviews of MI interventions in adults who have non-communicable chronic disease that have physical activity, cardiorespiratory fitness or functional exercise capacity as the outcome measure.

Inclusion criteria:

- Description of MI conforms to Miller and Rollnick's quality criteria (2014);[20]
- Studies designed to isolate the unique effect of MI, that is separate from other intervention elements such as cognitive behaviour therapy (CBT);
- Either narrative reviews or meta-analytic reviews;
- Primary outcome either physical activity, cardiorespiratory fitness or functional exercise capacity;
- Full paper available (not abstract only or unpublished doctoral dissertations).

Exclusion criteria:

- Physical activity outcomes were pooled with other behaviours (e.g. diet and exercise or general lifestyle change);
- Technology delivered MI.

Five electronic databases were searched for relevant systematic reviews from April 1983[21] until October 2019. The strategy was initially developed for articles published in English language for Ebsco MEDLINE and subsequently adapted for Ebsco PsycINFO, Ebsco CINAHL Plus, Web of Science Core Collection and the Cochrane Database of Systematic Reviews. Search terms were mapped to subject headings as keywords or MeSH terms where relevant. The search term motivational interviewing ("motivational interviewing" OR "motivational enhancement") was combined with physical activity ("physical activity" OR "cardiorespiratory fitness" OR "exercise" OR "exercise capacity") using the AND Boolean operator. Truncated forms of these terms were included. The search filter was used to identify systematic reviews including those with meta-analysis as identified within the published reports.

Other information sources were used to supplement those identified by the database search. This involved checking the reference lists of primary research retrieved and a review of the bibliography page on the MI website (http://motivationalinterviewing.org/motivational-interviewing-resources).

[20] See section 3.7. For a trial to be regarded as a true test of MI, Miller and Rollnick (2014) interventions should contain "should contain at least these three elements reflecting the engaging, focusing, and evoking processes of MI: i) proficiency in person-centred counselling style and specifically in the therapeutic skill of accurate empathy; ii) clear identification of one or more change goals toward which the intervention is directed; iii) differential evocation of clients' own motivational statements (change talk) for and commitment to change" (p. 238).

[21] The publication date of the Miller's original paper on MI (April 1983).

4.2.1.3 Results

4.2.1.3.1 Selection of systematic reviews

The PRISMA flow diagram shown in Figure 4-1 provides a summary of the records of systematic reviews identified, which ones were included and the point at which exclusions occurred.

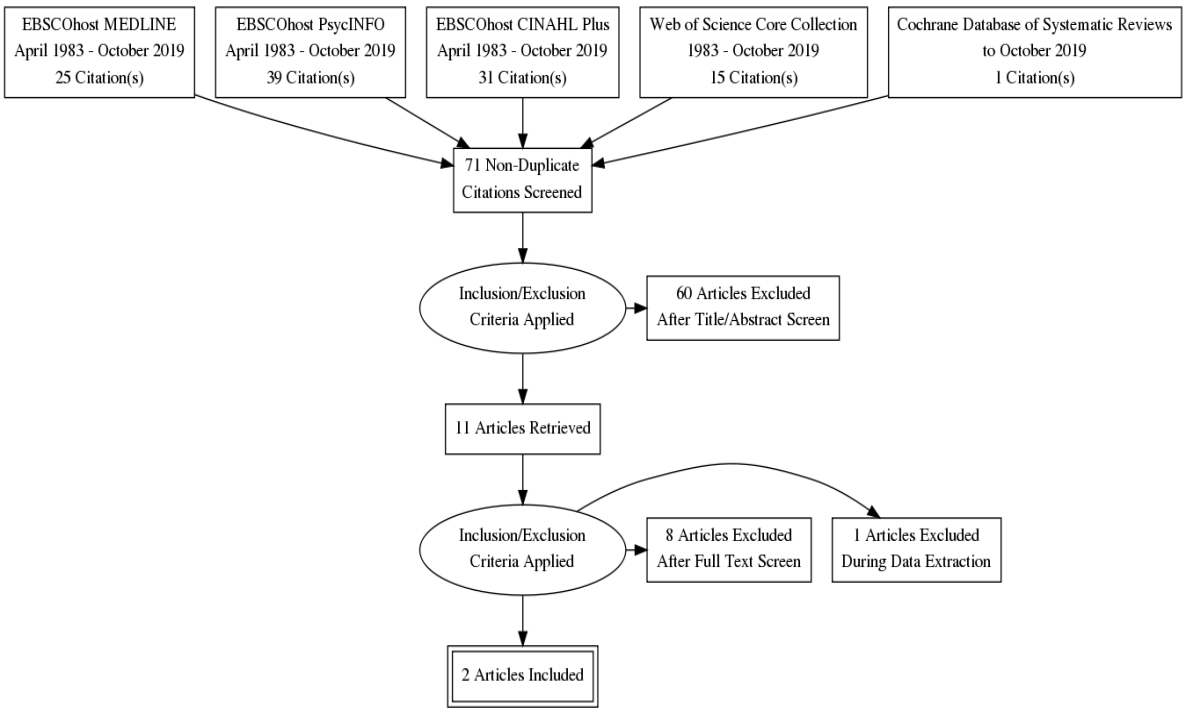


Figure 4-1. PRISMA flow diagram of search for review level evidence of motivational interviewing interventions in adults who have non-communicable chronic disease that have physical activity, cardiorespiratory fitness or functional exercise capacity as the outcome measure.

4.2.1.3.2 Systematic review characteristics

Two systematic reviews met the inclusion criteria.[22] One narrative review focused on MI for increasing physical activity for adults with type II diabetes (Soderlund 2018) and one meta-analysis examined the effect of MI to increase physical activity in adults with chronic health conditions

[22] In the interim period between the author's original literature search (spring 2019) and a later update (October 2019) another systematic review meeting the inclusion criteria emerged (Kahrmann et al. 2019). This contained a review of the six studies that had been identified by the author's own review of primary research (section 4.2.2) and one other that did not meet the inclusion criteria. The author elected to retain his own review of this primary research given the greater level of attention paid to treatment fidelity issues but acknowledge the existence of this systematic review.

(O'Halloran et al. 2014). There was no overlap in retrieved studies across the reviews owing to their differing inclusion criteria.

Both reviews described a focus on studies involving MI as described by Miller and Rollnick (2013) and excluded those only labelled MI. O'Halloran et al. (2014) specified the eligibility criteria used to make this determination. Soderlund (2018) described the use of a verification process to check that "MI was used in the tradition of Miller and Rollnick" (p. 56) but did not state explicitly what those criteria were, meaning that this aspect of the screening process would be difficult to replicate.

The reviews included a combined total of 19 studies of which there were 16 RCTs, one non-randomised controlled trial and two pilot studies. Included studies focused on people with the following chronic diseases: type II diabetes mellitus (n=9 studies); fibromyalgia (n=1); obesity with or without hypertension or hypercholesterolaemia (n=4); multiple sclerosis with or without major depressive disorder or dysthymia (n=2); hyperlipidaemia (n=1); peripheral artery disease (n=1); acute coronary syndromes (n=1). Collectively the studies involved 4,245 participants.

MI was delivered as the primary or standalone intervention within 10 trials and as an addition to another programme or standard care in nine. Physical activity was the sole intervention focus in three trials. Sixteen trials involved either a MI intervention in which participants chose between discussing physical activity or some other behaviour, or one in which MI was used to target several health behaviours (including physical activity) concurrently.

The dose of MI varied considerably between trials from one, 30-45-minute session to 11-sessions, each lasting approximately 30-minutes. The quality of MI delivered was measured in 10 trials, but only five confirmed the adequacy of skills through use of a recognised treatment integrity instrument. A summary of the characteristics of the reviews is provided in Table 4-2 (page 68).

Table 4-2 *Characteristics and Main Findings of Two Systematic Reviews of the Effect of Motivational Interviewing (MI) on Physical Activity in People with Non-Communicable Chronic Disease*

Review author	Objective	Number and design of studies	Participants	Intervention	Outcomes	Effectiveness
O'Halloran et al. (2014)	To determine if MI leads to increased physical activity, cardiorespiratory fitness or functional exercise capacity in people with chronic health conditions.	10 RCTs. Eight pooled for meta-analysis. Total n= 981	Adults aged ≥18 years with a chronic health condition: fibromyalgia, overweight/obesity, multiple sclerosis with/without major depressive disorder or dysthymia, hypertension, hypercholesterolaemia, peripheral artery disease, acute coronary syndromes.	*Application:* MI delivered as primary/standalone intervention within 6 trials and as an addition to a weight loss programme, supervised exercise or educational materials in 4 trials. *Dose:* 8 trials involved ≥3 sessions; 2 trials provided ≤1-hour of MI. *Treatment integrity:* 8 trials reported measuring treatment integrity, 3 with acceptable levels based on results using a valid and reliable instrument.	Physical activity, cardiorespiratory fitness, functional exercise capacity.	Moderate level evidence of a small effect of MI on physical activity relative to comparison groups observed immediately following the intervention (standardised mean differences = 0.19, 95% CI: 0.06, 0.32; $p < .01$, I^2=0%). Sensitivity analysis based on trials with confirmed treatment fidelity produced a larger pooled effect of MI on physical activity 0.30 (95% CI: 0.10, 0.50, $p < .01$, I^2 = 0%). No conclusive evidence for cardiorespiratory fitness or functional exercise capacity.

Review author	Objective	Number and design of studies	Participants	Intervention	Outcomes	Effectiveness
Soderlund (2018)	To examine the effectiveness of MI for physical activity self-management for adults diagnosed with diabetes mellitus type 2.	9 studies (6 RCTs, 1 pilot RCT, 1 non-randomised controlled trial, 1 before/after pilot). Total: n= 3, 264	Adults aged ≥18 years (mean age 40-50 years) with type 2 diabetes.	*Application:* MI delivered as primary/standalone intervention within 4 trials, as an addition to standard care in 5 trials. *Dose:* Trials involved between 2 – 10 MI sessions delivered face-to-face or combination of face-to-face and phone. Total volume (where stated) ranged 1hr- 3 to 6-hours. *Treatment integrity:* Two reports confirmed satisfactory 'MI proficiency'. Not reported in 7 trials.	Physical activity, blood glucose, self-report medication usage and self-care outcomes.	Four studies reported positive physical activity outcomes. Five studies reported no effect. Better outcomes were more likely when: 1) MI dose involved a frequency of >2 sessions, averaging > 1/month, emphasised a minimum duration of 30-45-minutes/session, or emphasised both frequency and duration; 2: attrition was low; 3) MI/physical activity focus was not distracted by several other diabetes self-management behaviours; and 4) adequate treatment fidelity was confirmed.

Note. CI = confidence interval; MI = motivational interviewing; RCT = randomised controlled trial.

4.2.1.3.3 **Methodological quality of reviewed studies**

O'Halloran et al. (2014) evaluated the risk of bias within individual trials using the Physiotherapy Evidence Database (PEDro) scale (de Morton 2009) and judged nine trials to be of a moderate quality and one of a high quality. Most commonly, studies were undermined by issues with blinding, a high loss to follow-up and a reliance on self-report physical activity. Soderlund (2018) identified similar issues though did not report results of a formal evaluation.

Authors of both reviews described an absence or poor reporting of treatment fidelity as a common limitation. In many cases the quality of MI delivered (treatment integrity) was either not measured, not reported, or confirmed as being below what is deemed acceptable in a clinical trial. Moreover, a lack of specificity in reporting made it difficult to determine how much physical activity focused MI was actually delivered. This was particularly the case in studies that used MI to target multiple behaviours. The potential moderating impact of MI integrity and dose on physical activity outcomes were explored and the outcomes are discussed in more detail within the next section.

Additional limitations not reported by review authors include the absence of information relating to the power of individual studies to detect between group differences in physical activity at follow-up. Whilst review authors pointed out the potential bias associated with self-report measures of physical activity, they did not acknowledge the limitations that arise from use of instruments that have not been validated for the intended purpose. Soderlund (2018) did not specify which physical activity measures were used and O'Halloran et al. (2014) revealed that two studies used the International Physical Activity Questionnaire that was designed for use in population rather than intervention-based research (Limb et al. 2019).

4.2.1.3.4 **Outcomes: main effects in relation to the research question**

Overall, the reviews provide mixed evidence for the effects of MI on physical activity in people with a non-communicable chronic disease. O'Halloran et al. (2014) reported an overall small effect of MI on physical activity relative to comparison groups observed immediately following the intervention (standardised mean difference = 0.19, 95% CI: 0.06, 0.32; $p < .01$, I^2=0%). The low heterogeneity score indicated the direction of effect across studies was consistent, albeit the size of effect and confidence intervals around the mean differed between studies. Of note, larger studies reviewed by O'Halloran et al. (2014) tended to result in smaller effects and smaller confidence intervals.

The authors concluded that in light of the study limitations, inconsistency of results, indirectness of evidence, imprecisions and reporting bias, there was moderate evidence for the

effect of MI on physical activity based on the Grades of Recommendation, Assessment, Development and Evaluation (GRADE) approach (Guyatt et al. 2008a; Guyatt et al. 2008b).

In the narrative review, Soderlund (2018) reported that four of the nine identified studies found an effect of MI on physical activity in people with type II diabetes mellitus. There was no evidence of a sustained effect of MI on physical activity. Two studies with longer term follow-ups (3 and 6-months in one trial and 12-months in another) reviewed by O'Halloran et al. (2014) found no effect of MI. Similarly, Soderlund (2018) found no main effect of MI on physical activity with longer-term follow-ups. Moreover, there was no evidence of an effect of MI on cardiorespiratory fitness or exercise capacity (O'Halloran et al. 2014). O'Halloran et al. (2014) speculated that MI may increase physical activity but not to the level that is sufficient to impact these physiological outcomes.

4.2.1.3.5 Potential moderators of outcome

O'Halloran et al. (2014) completed sensitivity analysis in which the seven (of 10) trials without confirmed treatment integrity were removed from the analysis. This resulted in an increase in the standardised mean difference between intervention and control groups from 0.19, (95% CI: 0.06, 0.32; $p < .01$) to 0.30 (95% CI: 0.10, 0.50; $p < .01$, $I^2 = 0\%$). Soderlund (2018) reported that two of the four studies reporting positive physical activity outcomes confirmed adequacy of MI skill whereas only one study with null findings measured MI integrity, which was found to be below recognised standards.

The dose of MI varied across trials in both reviews. O'Halloran et al. (2014) noted that larger effects on physical activity outcomes were observed in studies with higher levels of intervention delivery, but the lack of information provided in published reports regarding the amount of MI actually delivered prevented a formal test of this. The authors concluded that effects may be larger when MI is used to target a single behaviour, so its impact is not diluted. Soderlund (2018) similarly concluded that better outcomes tend to be observed when MI is used to focus on physical activity alone or with a maximum of one additional diabetes self-management behaviour. Frequent MI (more than two sessions that average more than once per month) was considered to lead to better physical activity outcomes. Additionally, less frequent sessions may increase physical activity if they last more than 30-minutes.

4.2.1.4 Discussion of systematic review level evidence

4.2.1.4.1 Summary of main findings and synthesis with other systematic reviews

Overall, the results of these systematic reviews indicate that MI may lead to modest increases in physical activity for people with a non-communicable chronic disease, but it does not appear to

work in all circumstances. Review authors concluded that the body of research in this area is small and most studies are undermined by several methodological weaknesses, therefore it is not possible to draw strong conclusions regarding effectiveness at this time. Four of the systematic reviews that were excluded from the present review of reviews (because they did not focus exclusively on physical activity studies in people with chronic disease) reported physical activity outcomes that were broadly consistent with those reviewed here (Lundahl et al. 2013; Vanbuskirk and Wetherell 2013; Purath et al. 2014; Morton et al. 2015).

The quality of MI delivery was identified as a potential moderator of outcome by O'Halloran et al. (2014) and Soderlund (2018). The superior outcome in studies with confirmed treatment integrity provides some support for Miller and Rollnick's (2014) assertion that some of the heterogeneity observed in meta-analyses of MI may result from variation in quality of MI delivered. This conclusion is tentative however, as the analyses upon which it is based does not account for differences between studies that are attributable to the study population, design or other aspects of trial conduct. In a review of MI in medical settings, Lundahl et al. (2013) did not find a relationship between treatment integrity and behavioural outcomes, though high levels of MI skill were observed across included studies.

O'Halloran et al. (2014) and Soderlund (2018) identified a positive relationship between MI dose and physical activity. This trend was also reported by Morton et al. (2015) in a separate review of MI in health contexts, but not in two reviews of MI across behaviours (Lundahl et al. 2013; Vanbuskirk and Wetherell 2013). This may indicate that the moderating effect of MI dose may differ across behavioural targets.

4.2.2 Primary research: Effects of motivational interviewing on physical activity and related outcomes in the context of pulmonary rehabilitation

4.2.2.1 Rationale

The systematic reviews identified in 4.2.1.3.1 did not include any studies in which MI has been used in the context of PR with patients who have COPD. A review of primary studies was therefore deemed necessary to enable judgments about this novel application.

4.2.2.2 Review question

Does evidence from RCTs indicate that MI is effective for increasing physical activity, cardiorespiratory fitness or functional exercise capacity in adults with COPD referred for PR?

4.2.2.3 Search strategy

The search strategy detailed in section 4.2.1.2 (page 64) was adapted to identify primary research in which MI has been used to increase physical activity for patients with COPD referred for PR. The following inclusion and exclusion criteria were used:

Inclusion criteria:

- RCT describing the intervention as MI or using the style of MI to underpin intervention delivery;
- Individual MI counselling (delivered face-to face or by telephone);
- Studies involving outpatient PR as an intervention component or those in which participants are recommended to attend PR as part of usual care;
- Studies reporting the effect of the intervention on objectively measured physical activity (as a primary or secondary outcome), cardiorespiratory fitness, or functional exercise capacity;
- Involving adults with a COPD (aged 18 years and over);
- Full paper available (not abstract only or unpublished doctoral dissertations).

Exclusion criteria

- Studies in which the intervention is described as being based on the 'transtheoretical model' or the 'stages of change';
- Technology delivered MI.

Four electronic databases were searched for relevant primary research studies from April 1983 until October 2019. The strategy was initially developed for articles published in English language for Ebsco MEDLINE and subsequently adapted for Ebsco PsycINFO, Ebsco CINAHL Plus and the Web of Science Core Collection. Search terms were mapped to subject headings as keywords or MeSH terms where relevant.

The search term motivational interviewing ("motivational interviewing" OR "motivational enhancement" OR "activity counselling") was combined with physical activity ("physical activity" OR "physical fitness" OR "cardiorespiratory fitness" OR "exercise" OR "exercise capacity"), Chronic Obstructive Pulmonary Disease ("Chronic Obstructive Pulmonary Disease" OR "obstructive lung disease") and pulmonary rehabilitation ("pulmonary rehabilitation" OR "rehabilitation") using the AND Boolean operator. Truncated forms of these terms were included.

Other information sources were used to supplement those identified by the database search specifically to identify research investigating the effect of MI to increase physical activity referred for PR. This involved checking the reference lists of primary research retrieved and a review of the bibliography page on the MI website (http://motivationalinterviewing.org/motivational-interviewing-resources).

4.2.2.4 Results

4.2.2.4.1 Selection of studies

The PRISMA flow diagram shown in Figure 4-2 (page 74) contains a summary of the primary research identified, which studies were included and the point at which exclusions occurred.

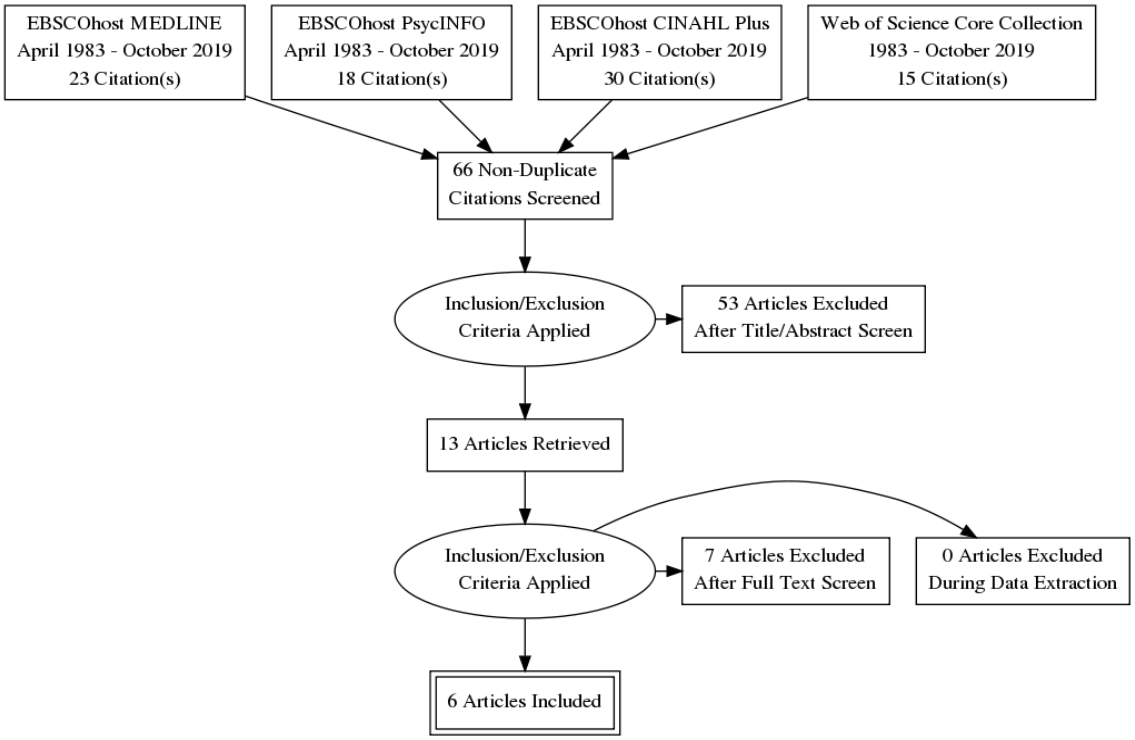


Figure 4-2. PRISMA flow diagram of search for primary research testing the effect of motivational interviewing interventions in adults with Chronic Obstructive Pulmonary Disease referred for pulmonary rehabilitation that has physical activity, cardiorespiratory fitness or functional exercise capacity as the outcome measure.

4.2.2.4.2 Study characteristics

The search strategy yielded six published reports of five studies: a pilot RCT (de Blok et al. 2006), three RCTs (Altenburg et al. 2015; Burtin et al. 2015; Benzo et al. 2016) and a randomised controlled equivalence trial (Holland et al. 2013). Lahham et al. (2019) completed a secondary analysis of the physical activity outcomes from the equivalence trial reported by Holland et al.

(2013), the results of which are reported together. The design characteristics of each trial are summarised in Table 4-3 (page 77).

Participants

Sample sizes ranged from 21 to 215 participants. Mean COPD severity within each study was moderate to severe COPD based on the GOLD (2020) classification. Mean baseline daily step count ranged between 2448 to 3836, which was below the 4580 steps/day threshold of severe inactivity identified by Depew et al. (2012).

Intervention

Details of the MI component of each intervention are summarised in Table 4-4 (page 81).

Design and intended use

Three studies involved MI as part of a multi-component counselling intervention focused on increasing physical activity delivered as an adjunct to PR (de Blok et al. 2006; Altenburg et al. 2015; Burtin et al. 2015). These interventions involved several behaviour change techniques including goal setting and self-monitoring together with feedback from an activity monitor on the quantity of physical activity performed. Two studies used MI to target multiple COPD self-management behaviours (Benzo et al. 2016; Holland et al. 2017). Participants in both intervention and control groups in the study reported by Benzo et al. (2016) were recommended to attend for PR as part of usual care. The equivalence trial used MI as part of a home-based PR programme which was tested against traditional centre-based PR (Holland et al. 2017).

Description of motivational interviewing

The use of MI was described variably across studies. At one extreme, descriptions were limited to statements that providers "followed the principles of motivational interview technique" (de Blok et al. 2006 p. 50) or "motivational interviewing techniques were used" (Altenburg et al. 2015 p. 114). More in-depth descriptions were provided within published reports of the other three studies. The most comprehensive of these (Benzo et al. 2016) indicated clear alignment with the spirit and principles of MI that had been tested as part of comprehensive pilot studies (Benzo et al. 2013).

Intended dose

The planned dose of MI varied between trials. Most involved between four to eight sessions, delivered over the course of rehabilitation (7-weeks to 6-months) with each session lasting between 20 to 30-minutes (de Blok et al. 2006; Altenburg et al. 2015; Burtin et al. 2015; Holland

et al. 2017). One involved considerably more; 21 sessions delivered as a standalone intervention over 12-months (Benzo et al. 2016).

It was not possible to determine the exact amount of physical activity focused MI in each intervention because MI was either used as an underpinning style of working rather than a discrete element (de Blok et al. 2006; Altenburg et al. 2015) or used to target additional COPD self-management behaviours alongside physical activity (Benzo et al. 2016; Holland et al. 2017). An exception was the trial reported by Burtin et al. (2015), which involved a total of between 2-hours 40-minutes and 3-hours of physical activity focused MI delivered over eight sessions.

Intervention delivery

Across trials, intervention delivery was performed by clinicians that are involved in usual care for patients with COPD. Altenburg et al. (2015) and Benzo et al. (2016) involved two clinicians. Three studies did not specify the number of MI providers (de Blok et al. 2006; Burtin et al. 2015; Holland et al. 2017).

Comparison

The three studies examining the additive effect of an MI-based intervention on PR used PR as the comparison (de Blok et al. 2006; Altenburg et al. 2015; Burtin et al. 2015). Of these, only Burtin et al. (2015) used an additional attention control to control for the one-to-one contact provided by MI. Holland et al. (2017) compared MI-based PR delivered at home with traditional centre-based PR and Benzo et al. (2016) used a treatment as usual comparison.

Outcome Assessment

Assessment of physical activity and/or fitness related outcomes were made at baseline and at the end of the intervention. Altenburg et al. (2015) and Holland et al. (2017) also included a longer-term follow-up (15-months and 12-months respectively).

Table 4-3 *Characteristics of Primary Research Testing the Effect of Motivational Interviewing (MI) Based Interventions on Physical Activity for Patients with Chronic Obstructive Pulmonary Disease (COPD) Referred for Pulmonary Rehabilitation (PR)*

Trial	Design	Recruited from: n=	FEV_1 % predicted	Conditions	Primary outcome/ analysis	Physical activity assessment tool
Altenburg et al. (2015)[a]	RCT	PR centre n=155 (61 in PR arm of study)	Total sample 43 (28-58) median (IQR)	I: 12-week pedometer-based exercise counselling programme as adjunct to 9-week PR. C: 9-week PR	Change (0-3months and 0-15 months) steps/day and daily activity (derived from steps + METs of cycling, fitness activities and swimming). Analysis: PP	Digiwalker SW-2000 pedometer (worn during awake time for 2-weeks). Diary used to log minutes of other activities which were converted into METS using compendium of activities (Ainsworth et al. 1993 and Ainsworth et al. 2000).
Benzo et al. (2016)	RCT	Hospitalised for COPD exacerbation n=215	I: 40.3 ±17.2 C: 40.5 ±17.1	I: 12-month MI-based health coaching + written action plan for exacerbations + exercise prescription+ self-management book + referral for PR over 12-months. C: Usual care including PR referral.	Rate of COPD-related hospital hospitalisations at 12-months. Secondary outcome: steps per day and minutes spent in ≥ moderate intensity physical activity at 6 and 12-months. Analysis: ITT for re-hospitalisation. PP for physical activity	BodyMedia armband accelerometer worn for ≥ 4-days.

Trial	Design	Recruited from: n=	FEV_1 % predicted	Conditions	Primary outcome/ analysis	Physical activity assessment tool
Burtin et al. (2015)	RCT	Referred for outpatient PR n=80	I: 45 ±14 C: 46 ±18	I: Adjunct to 6-months outpatient PR programme. C: Outpatient PR + attention control.	Change in daily walking time and time spent in at least moderate intensity activity baseline –6-months. Analysis: PP	Minimod and Sensewear Pro Armband accelerometers (worn during waking time for 5±1 days (baseline) and 4±1 days (6-months).
de Blok et al. (2006)	Pilot RCT	Referred for outpatient PR n=21	I: 52 ±22 C: 43 ±13	I: physical activity counselling + feedback from pedometer + 9-week PR. C: PR	Change in mean steps/day for 7-days including PR activity (baseline to end of PR at 9-weeks). Analysis: PP	Yamax Digi-Walker SW-200 pedometer worn for 7-days.
Holland et al. (2017) Lahham et al. (2019)[b]	RCT (equivalence trial)	PR waiting lists n=166 physical activity outcomes involved sub-set of n=67	Home-based PR 52 ±19 Centre-based PR 49 ±19	Home-based PR: Structured home-based 8-week PR (face-to-face exercise prescription/ instruction + telephone-based MI) + PR maintenance programme offered. Centre based PR: traditional 8-week PR + PR maintenance programme offered.	6MWD baseline –end of PR and 12-months Secondary outcome: change in steps/day, minutes sedentary awake time, minutes MVPA/day, bouts of MVPA ≥10 minutes, duration MVPA in bouts, min/day baseline to end PR and 12-months. Analysis of 6MWD: ITT	SenseWear armband worn for 7-days. Min. 4-valid days inc. 1-weekend day required.

Note. 6MWD = six-minute walk distance; C = control; CI = confidence intervals; I = intervention; IQR = inter quartile range; ITT = intent to treat analysis; MVPA = moderate to vigorous physical activities; PP = per protocol analysis; RCT = randomised controlled trial. ± = standard deviation; IQR = interquartile range. [a]Data for pulmonary rehabilitation arm of the study. [b]Secondary analysis of the RCT, which contains additional information regarding the conduct and analysis of physical activity outcomes.

4.2.2.4.3 **Methodological quality of individual studies**

The risk of bias within the five studies was evaluated using the PEDro scale, which has been validated for assessing the internal validity of clinical trials (de Morton 2009). This enabled comparisons with scores for the trials assessed by O'Halloran et al. (2014). Each trial was assessed on the eleven criteria based on guidelines provided by Maher et al. (2003). Scores for all items (with exception of 'eligibility criteria' which is not scored) were summed, with overall scores used to assign a rating of quality based on the cut-offs used by O'Halloran et al. (2014): low (0-4); moderate (5-7); or high (8-10). One trial was rated as low quality, three trials were of a moderate quality and one was rated as being high quality (see Table C-1. Appendix C, page 339). The remainder of this section is focused on specific aspects of methodological quality that the thesis author deemed to be particularly important.

Uptake bias

The proportion of patients who were approached but did not participate varied widely across trials. This ranged from one of 30 eligible patients (3%) in the pilot RCT (de Blok et al. 2006) to 754 of 969 (79%) in a larger scale study involving patients recently hospitalised for COPD exacerbation (Benzo et al. 2016). Motivational issues were the most common reasons for non-participation. For example, Benzo et al. (2016) described a lack of interest, perception of being 'too ill or frail or disabled' and the perception of being 'too busy' as the main reasons given by those approached.

Attrition bias

Across trials, attrition was evident for physical activity outcomes (through missing data or loss to follow-up) and ranged from 24% (de Blok et al. 2006) to 39% (Altenburg et al. 2015) immediately following MI-based interventions. At longer term follow-ups the values ranged between 46% (Holland et al. 2017) to 62% (Altenburg et al. 2015).

Two trials reported having measures of a key outcome that was obtained for more than 85% of participants initially allocated. Benzo et al. (2016) and Holland et al. (2017) reported adequate follow-up data for COPD related rehospitalisation and change in 6-minute walk distance respectively. Both studies used intent-to-treat analysis to assess between group differences in these primary outcomes and were adequately powered. All studies were underpowered to detect differences in physical activity outcomes due to participant attrition.

Performance bias

Intervention delivery

The extent to which the intended dose of MI based intervention was delivered was reported in three studies (see Table 4-4, page 81). In one, 85% of participants received a complete MI-based intervention (defined *a priori* as receiving at least 15 of 21 scheduled calls) (Benzo et al. 2016). Burtin et al. (2015) noted that 82% of planned counselling sessions were received by study completers, though no information was provided for the entire sample. Holland et al. (2017) reported participants in the intervention group received an average of 7.4 of 8 scheduled calls (range 0-8). Using criteria developed *a priori* for programme completion (attendance for 70% of planned sessions) 91% and 49% of participants completed the centre-based and home-based programmes respectively. The remaining studies did not report completion of intervention sessions.

Treatment integrity

Details of treatment integrity are provided in Table 4-4 (page 81). Three trials reported having monitored the quality of MI delivery (Burtin et al. 2015; Benzo et al. 2016; Holland et al. 2017). One formally evaluated MI skills using the Motivational Interviewing Treatment Integrity (MITI) coding system and confirmed achievement of basic competency on all global ratings (Benzo et al. 2016). Neither Holland et al. (2017) nor Burtin et al. (2015) provided details of the quality of MI actually delivered.

Table 4-4 *Components of Treatment Fidelity within Trials Testing the Effect of Motivational Interviewing (MI) Based Interventions on Physical Activity for Patients with Chronic Obstructive Pulmonary Disease (COPD) Referred for Pulmonary Rehabilitation (PR)*

Article	Description of MI component of intervention	Dose	MI provider	MI training and baseline skill	Intervention delivery	Treatment integrity
Altenburg et al. (2015)	"Predominantly based on the principles of goal setting and implementation of goals and MI techniques were used." (p.114). Structure as described in pilot studies (de Blok et al. (2006) and Hospes et al. (2009).	5 x 30-minute sessions over 12-weeks	Trained exercise counsellors n=2	Interventionists were "trained"' but details not provided.	Not reported	Not reported

Article	Description of MI component of intervention	Dose	MI provider	MI training and baseline skill	Intervention delivery	Treatment integrity
Benzo et al. (2016) Benzo et al. (2013) [a]	Face to face in hospital and at least once at home. Telephone calls 30-minutes each guided by flexible intervention manual ('road-map)' in which patients select a self-management domain. MI spirit used to underpin coaching summarised as "The patient is the expert; the coach is willing to listen deeply to understand the patient; and the participant is empowered to adopt the behaviour he or she feels is important to pursue, even if not related to the pulmonary condition…. and they tried to explore the patient's near-term hopes and goals to work on." (p. 673).	1-hospital visit + 21 telephone calls - weekly in first 12 weeks then monthly from months 3-12	Nurse n=1, respiratory therapist n=1	Reported in pilot (Benzo et al. 2013): Face to face theory (6-hours); reading; role-play based learning of intervention (5-hours) feedback and coaching to strengthen skills and address drift (10-hours over 6-months). Pilot study sessions recorded and analysed with MITI 3.1.1 Confirmed achievement of $\geq$ 3 on each global rating.	Intervention group, 85% received a complete intervention ($\geq$15/21 calls completed).	5% coaching sessions analysed using global ratings from MITI 3.1.1. + intervention road-map with feedback provided to prevent drift. Mean empathy 3.9 (±0.5); collaboration 4 (±0.6); autonomy/support 4 (±0.3); direction 3.9 (±0.5); evocation 3.9 (±0.5).
Burtin et al. (2015)	"… sessions emphasised a collaborative, empathic, non-judgmental atmosphere" (p.4). Evaluation of motivation and confidence used to determine appropriate strategy; MI used where motivation was low ($\leq$8/10). Describes exploration of ambivalence using decisional balance and use of spirit of MI to enhance motivation. Action planning, goal setting, barrier identification and relapse prevention for more motivated participants.	8 x 20-30 minute counselling sessions over 6-months PR	Research assistant n=not specified	Brief training in principles of MI (3 x 60 minutes). Baseline skill not assessed. Feedback on MI performance based on video-recorded intervention sessions provided during study.	82% of planned counselling sessions were delivered.	Sessions were video-recorded and discussed with health psychologist, but no formal evaluation undertaken.

Article	Description of MI component of intervention	Dose	MI provider	MI training and baseline skill	Intervention delivery	Treatment integrity
de Blok et al. (2006)	Structured physical activity counselling "followed the principles of MI technique" (p. 50). 2-weeks prior to PR (motivation for increasing physical activity); week 1 (goal setting); week 5 (shifting boundaries and establishing maximum step target); week 7 (consolidation of physical activity behaviour).	4 x 30-minute sessions over 9-weeks	Physical therapists n=not specified	Interventionists were 'trained' but details not provided.	Not reported	Not reported

Article	Description of MI component of intervention	Dose	MI provider	MI training and baseline skill	Intervention delivery	Treatment integrity
Holland et al. (2017)	Structured telephone modules with written interviewer prompts "collaborative discussions will be directed toward building the perceived importance of behaviour change, increasing confidence, identifying motivations for change and setting specific goals through emphasis on participants producing their own arguments for change (from methods paper: Holland et al. 2013 p.4). Initial home visit to provide exercise prescription/guidance. Telephone calls to review and progress physical activity, and discuss patient selected self-management issue.	1 x home-visit + 7 weekly structured telephone calls over 8 weeks (planned duration not specified)	Physiotherapists n=not specified	From methods paper: "Physiotherapists undertaking the intervention will complete formal training in MI and receive follow-up support " (Holland et al. 2013 p.4).	Completion of 7.4 of 8 scheduled sessions (range 0-8). Average duration of first call 27-minutes (±8 minutes), subsequent calls 20-minutes (±7 minutes).	"There were periodic checks on fidelity by an independent MI practitioner." (Holland et al. 2017 p.58). No formal assessment of skills reported.

Note. MI = motivational interviewing; MITI = Motivational Interviewing Treatment Integrity coding system. [a]Intervention development and pilot testing described in "Development and feasibility of a self-management intervention for chronic obstructive pulmonary disease delivered with motivational interviewing strategies" by R Benzo, K Vickers, D Ernst, S Tucker, C McEvoy and K Lorig (2013). Journal of Cardiopulmonary Rehabilitation and Prevention 33(2): 113-123.

4.2.2.4.4 **Main findings**

The main results of each trial are presented in Table 4-5 (page 86). All five studies reported physical activity related outcomes following the MI-based intervention, of which two showed a positive effect. Altenburg et al. (2015) found between group differences in change scores for steps and daily activity at the end of a 3-month PR programme. Holland et al. (2017) reported non-inferiority of an 8-week home-based PR programme involving MI relative to centre-based PR on 6-minute walk distance and no differences in physical activity outcomes. Three trials reported no effect on physical activity (de Blok et al. 2006; Burtin et al. 2015; Benzo et al. 2016).

Two studies reported the results of longer-term follow-ups to evaluate the sustained effect of the MI-based intervention. Altenburg et al. (2015) found no between group difference in change in daily steps or physical activity levels from baseline to 15-months in the PR arm of the study. Holland et al. (2017) reported that the between group difference in change in 6-minute walk distance from baseline to 12-months was not sufficient to rule out inferiority. Moreover, improvements in walk distance and measures of physical activity across groups were not maintained at follow-up.

Table 4-5 *Main Findings of Primary Research Testing the Effect of Motivational Interviewing (MI) Based Interventions on Physical Activity for Patients with Chronic Obstructive Pulmonary Disease (COPD) Referred for Pulmonary Rehabilitation (PR)*

Trial	Baseline steps/day	Results		
		Post intervention	Follow-up	Withdrawal
Altenburg et al. (2015)[a]	Total sample: 2979 (2012-5002) data are median (IQR)	Change in daily steps (baseline to 3-months): I: 547 (187 – 1323), C: -211 (-1337 – 1038), *p*= .03 Change in daily activity I: 1302 (-173 – 1922), C: -849 (-2223 – 961) *p*= .03 data are median (IQR)	Change in daily steps (baseline to 15-months) I: -569 (-2512 – 1551), C: -1137 (-2376 – 1427), *p*= .58 Change in daily activity I: -213 (-4525–2274); C: -1827 (-3540 – 629), *p*= .97 data are median (IQR)	3-months: I: 29% C: 50% 15-months: I: 68% C: 57%
Benzo et al. (2016)	I: 2448 ±2031 C: 2790 ±3001	Change in physical activity level (baseline to 6-months) I: 0.01, C: 0.01, (CI not reported) (*p*> .05) Change in physical activity level (baseline to 12-months) I: -0.10, C: 0.01 (CI not reported) (*p*> .05) Attendance for PR by 3-months I: 50%, C: 33% (*p*= .02) Attendance for PR by 12-months I: 53%, C: 43% (*p*= .06)		Not provided for physical activity outcomes
Burtin et al. (2015)	I: 3408 (1732 – 5709) C: 2574 (1592 – 4631)	No significant between group difference in daily walk time, daily time spent in at least moderate intense activities (intervention/control change scores not provided) (all *p*s > .05)		6-months: I: 30% C: 45%

	data are median (IQR)			
de Blok et al. (2006)	I: 2082 (95% CI: 1139, 3025) C: 2377 (95% CI: 1370, 3384)	Change in steps/day for 7 days (baseline to 9-weeks) I: 1787 (95% CI not provided), C: 1220 (95% CI not provided), *p*= .38		9-weeks: I: 20% C: 27%
Holland et al. (2017) Lahham et al. (2019)[b]	Home-based 3836 ±2657 Centre-based 3670 ± 2532	Between group difference at 8-weeks Steps/day 680 (95% CI: -286, 1648), *p*> .05 Total energy expenditure 262 (95% CI: -423, 947), *p*> .05	Between group difference at 12-months Steps/day 162 (95% CI: -1020, 1344), *p*> .05 Total energy expenditure 112 (95% CI: -714, -937), *p*> .05	Physical activity outcomes: 8-weeks: Home-based: 31% Centre-based: 34%

Note. Data are presented as means unless otherwise stated. I = intervention; C= control; CI = confidence interval; ± = standard deviation; IQR: interquartile range. [a]Results reported for the PR arm of this study. [b]Secondary analysis of the RCT, which contains additional information regarding the conduct and analysis of physical activity outcomes.

4.2.2.5 Discussion of primary research evidence

4.2.2.5.1 Summary of evidence

This review identified five trials testing the effect of MI-based interventions delivered in the context of PR on physical activity. The studies provided mixed evidence for the effects of MI. Favourable outcomes were observed in two studies immediately after the intervention, but sustained benefits were not evident in studies with longer term follow-ups.

It is not possible to draw strong conclusions about the effectiveness of MI used as an adjunct to PR at this time. One reason is because of the small number of published studies using this particular application of MI. Of the five studies reviewed, only three tested the additive effects of MI to PR. Moreover, one of the studies reporting positive outcomes was an equivalence trial rather than a test of the additive effect of MI on PR (Holland et al. 2017). Interpretation of this body of evidence is further complicated by the methodological limitations that were noted in section 4.2.2.4.3 (page 79). The implications of these are discussed in the next section.

4.2.2.5.2 Limitations of reviewed studies

Several limitations undermined the internal validity of the reviewed studies, which are reflected in the PEDro ratings. The risk of bias was broadly similar to that found in studies reviewed by O'Halloran et al. (2014). A common problem was high loss to follow-up. Since those who drop-out following randomisation may not be representative of the entire sample, it is important that all individuals are included in the analysis of outcomes according to the group they were allocated (intent-to-treat) to minimise bias. However, none of the trials used such an analysis for physical activity outcomes, which was particularly problematic in light of the high loss to follow-up. The loss to follow-up also meant that trials were underpowered to detect between group differences in physical activity outcomes and gives rise to the potential for type II error.

Other uncertainties about the effects of MI in PR may be attributable to variability in treatment fidelity across trials (see Table 4-4, page 81). One issue is that the content of what was meant to be delivered was not always clear from published reports, which raises the question as to whether they involved MI in its *pristine* form as described by Miller and Rollnick (2013). Two trials labelled the intervention as MI, but failed to confirm the exact content or style of working that was meant to be delivered (de Blok et al. 2006; Altenburg et al. 2015). Holland et al. (2017) provided more detail but made little reference to the autonomy respecting, empathic style that is central to MI practice (Miller and Rose 2009; Miller and Rollnick 2013). Moreover, Miller and Rollnick (2014 p. 235) argue that *bona fide* tests of MI must avoid practices that may contradict MI and undermine its effectiveness. Three studies combined MI with other interventions such as

goal setting with protocols that required MI-providers to transition from building motivation in the first counselling session to goal setting in the second, independent of whether ambivalence had been resolved and participants were ready to change. This carries the potential for overlooking resistance and undermining patient autonomy. One study (Burtin et al. 2015) described the use of a decisional balance exercise in which participants listed "benefits and costs of changing and not changing behaviour in parallel columns." (p. 4). As Miller and Rose (2013) have reported, this can be counterproductive with people who are ambivalent by decreasing commitment to change.

Another limitation of reviewed studies relates to the quality of MI delivered during each trial. MI has been described as deceptively simple, yet not easy (Miller and Rollnick 2009). As highlighted by Miller and Rollnick (2014), detailing intended intervention content provides no guarantee of what was actually delivered. Only one study confirmed adequate skill in delivery (Benzo et al. 2016), which raised the potential for Type III error (that is erroneously concluding an intervention does not work when it was not implemented appropriately). It is possible that some of the variation in outcomes could be attributable to differences in the quality of MI delivered in each study.

Treatment dose is a function of the intended volume (number and duration of sessions) and the amount actually delivered (Bellg et al. 2004). Across studies the planned dose of physical activity focused MI was seldom clear and whilst three studies confirmed adequacy of intervention delivery, two did not. This lack of clarity makes it difficult to draw conclusions as to the influence of volume (and spacing of sessions) of MI on physical activity outcomes.

All studies used clinicians that are involved in usual care for this patient group to provide MI, which was a strength. The small number of providers in two of the studies limits external validity though, since outcomes of MI are known to vary widely across providers, even within studies where delivery is tightly controlled (Miller and Moyers 2017). The lack of transparency in how many clinicians delivered MI in the remaining studies makes this aspect of external validity unclear.

4.2.3 Summary and implications: The effectiveness of motivational interviewing for increasing physical activity as part of pulmonary rehabilitation

The results of this review of systematic review level evidence and primary research suggest that MI may have a small positive effect on physical activity in people with chronic disease, but the results have been inconsistent, and MI does not appear to work in all circumstances.

It is possible that some of the variability in outcomes across studies may relate to treatment fidelity issues (Bellg et al. 2004; Miller and Rollnick 2014). This conclusion was drawn by authors of the two systematic reviews reviewed in section 4.2.1 (page 64) (O'Halloran et al. 2014; Soderlund 2018) and from the review of primary studies that the thesis author completed (section 4.2.2, page 72).

Intervention descriptions of PR focused studies indicated that the majority have used adapted forms of MI, rather than MI in its *pristine* form with all empirically supported elements included. Whilst this may be time efficient in terms intervention delivery and may reduce training requirements for providers, it risks Type III error. A related limitation has been an absence of treatment integrity measurement and reporting in many studies. This means it was not clear whether the intervention was delivered as intended and with what level of skill. Where treatment integrity has been reported, the quality of MI delivery was typically below that regarded as being "sufficient to conclude that MI was delivered and tested" (Miller and Rollnick 2014 p. 235).

To date, there does not appear to be any well conducted studies that have tested the additive effects of MI in its *pristine* form on PR. The impact that particular application therefore remains unclear.

To overcome the identified shortfalls, studies need to:

- Be adequately powered and involve intent-to-treat analysis;
- Involve MI as described by Miller and Rollnick (2013) and avoid using additional behaviour change techniques in a way that could undermine the effectiveness of MI;
- Involve sufficient frequency and dose of MI to give it a chance of working;
- Confirm intended number, duration and frequency of physical activity focused MI sessions and intervention delivery;
- Use several MI providers trained to basic competency criteria, with representation from all professions that are normally involved in PR delivery;
- Employ quality control measures to promote and protect the integrity of MI delivery and allow reporting of MI integrity in published reports. This should include the recording of all trial sessions and measuring MI skill and protocol adherence in a random sample of 10% using a validated measure to allow detection of sub-standard MI which can be addressed through feedback and coaching;
- Evaluate short-term and long-term effects using objective measurement of physical activity.

4.3 Learning motivational interviewing

There is evidence to suggest that outcomes of MI are moderated by the skill with which it is delivered. Clinicians' ability to manifest the spirit of MI and its constituent skills is known to influence client responses that are prognostic of outcomes (Hodgins et al. 2009; Borsari et al. 2015; Copeland et al. 2015; Magill et al. 2016; Magill et al. 2018a) and behaviour change (Moyers et al. 2009; Vader et al. 2010; Pirlott et al. 2012; Barnett et al. 2014). In common with other psychological interventions and clinical procedures, MI is not simple to learn and deliver as intended (Miller and Rollnick 2009). Rather it is a complex method that represents a fundamental departure from traditional approaches to motivating clients (Miller and Moyers 2007).

This section contains a review of research and current thinking about the amount and type of training necessary to develop MI skills. Factors that may moderate the impact of training are considered with particular reference to the implications for health professionals. Two theoretical frameworks are described that may help to guide future training efforts.

4.3.1 Training research

Interactive workshops have been the main approach used to teach clinicians MI (Madson et al. 2009b). Yet evidence shows that workshop training alone typically promotes only modest increases in MI skills, and any improvements tend to deteriorate over time (Söderlund et al. 2011; Barwick et al. 2012; de Roten et al. 2013; Schwalbe et al. 2014). This finding mirrors training outcomes for psychosocial treatments more broadly (Walters et al. 2005; Herschell et al. 2010; Rakovshik and McManus 2010; Webster-Stratton et al. 2014).

Larger, more enduring improvements in MI skill occur when workshop training is supplemented with on-going supervision, which typically involves objective feedback on practice and coaching (Söderlund et al. 2011; Barwick et al. 2012; de Roten et al. 2013; Schwalbe et al. 2014; Hall et al. 2016). Feedback is often based on analysis of client-sessions using a validated coding instrument, which involves comparing actual practice with competency targets, and identification of areas for improvement (see section 4.3.3, page 95 for a description of competency thresholds). Coaching sessions take different forms but generally provide positive reinforcement and opportunities for problem-solving difficulties the clinician has experienced whilst using MI. Sessions may also involve role-play and other skill-building exercises (Miller et al. 2004; Miller and Rollnick 2013).

Two meta-analyses have quantified the beneficial effects of supervision. De Roten et al. (2013) reported that one off-training normally delivered in a 12 to 16-hour workshop resulted in a

moderate increase in skill from pre to post training (4-week to 4-month follow-up) (effect size g = 0.69, 95% CI: 0.51 – 0.87), but skill gains were larger in studies that also included supervision (effect size g = 0.82, 95% CI: 0.69 – 0.94). Schwalbe et al. (2014) explored the impact of specific features of training and found that studies involving on-going coaching and/or feedback after workshop training showed maintenance of initial skill gains at follow-up (post workshop to 3-months d = -0.03; 95% CI: -0.45 - 0.39; post workshop to 6-months d = 0.04; 95% CI not reported). More enduring effects were observed in studies involving more frequent post-workshop contacts, an increased duration of contact and/or spread of training. The authors concluded that on average, three to four supervisory contacts involving feedback and coaching and totalling at least 5-hours over a 6-month period was the optimal level of training to sustain skills. This preliminary recommendation is based on comparisons across a heterogeneous group of studies with different populations, varying study designs, different type and quantity of training and different methods for assessing MI skill. As authors of both reviews have noted, the methodological quality of studies was variable and conclusions regarding the volume and intensity of supervision necessary to acquire and maintain skills should be viewed with caution.

It remains to be seen whether the type of supervision received differentially influences MI skill acquisition. In general, a lack of detail in published reports regarding the content and interpersonal style used to deliver coaching and feedback complicates comparisons across training studies and undermines the advancement of knowledge in this area (Madson et al. 2019). Several randomised controlled trials (RCTs) have experimentally manipulated different forms of supervision but have failed to provide strong evidence in favour of a particular approach. For example Miller et al. (2004) reported no significant difference in benefit between feedback and/or coaching on maintenance of skill gains, though a combination of feedback and coaching led to improved client in-session responses (increased change talk and decreased resistance) at 4-months. Smith et al. (2012b) compared live supervision via teleconferencing (that is real time feedback on MI skills provided through a telephone earpiece during role-played practice sessions) with traditional feedback and coaching for drug counsellors. Whilst superior maintenance of skills was reported for both groups relative to a workshop-only condition, no differences were evident between feedback conditions.

Martino et al. (2016) examined the effect of the 'Motivational Interviewing Assessment: Supervisory Tools for Enhancing Proficiency (MIA: STEP) programme, a systematic competency-based approach to clinical supervision for community substance use providers. Compared to those receiving supervision as usual, clinicians supervised by MIA: STEP showed greater improvements in the skill with which they used fundamental and advanced MI strategies over a 16-week follow-up. However, there were no between group differences in treatment retention or substance use amongst the clients they treated. Finally, Moyers et al. (2017) randomly

assigned substance use professionals to receive a workshop and supervision focused on client language or the same training but without such emphasis. Over a 12-month follow-up, sustain talk was lower in clients who had been treated by providers who had received the focused training, but there was no difference in change talk.

Variation in MI skill following training is the norm rather than the exception (Söderlund et al. 2011; Barwick et al. 2012; de Roten et al. 2013; Schwalbe et al. 2014; Hall et al. 2016) and some trainees fail to achieve meaningful levels of skill even after comprehensive input. Hall et al. (2016) systematically reviewed studies evaluating the impact of MI training on sustained MI competence. Using the criteria of 75% of trainees demonstrating basic competency on MI spirit at follow-up, only two of the 11 retrieved studies in which competence levels could be established achieved this threshold.

Given the variable impact of a fixed volume of training, a sensible approach may be to extend or curtail input depending on learners' initial response and achievement of competency criteria (Miller and Rollnick 2014). This idea has been addressed in a pilot study in which on-going training for addiction counsellors was stratified based on performance following initial web-based course (Martino et al. 2011). Participants meeting competency targets following the initial on-line training maintained their skills over 24-months without additional input. Those unable to demonstrate adequate levels of skill at that time who subsequently participated in a workshop and/or supervision, improved their MI skill. This study requires replication using a larger sample, but the results provide initial support for a stepwise training model.

The considerable resource involved in MI training, together with the variable skill acquisition has promoted some to question whether it is cost-effective to retrain all staff within an organisation (Carroll 2016; Hall et al. 2016). As Miller and Moyers (2017) have posited, it may be more appropriate to focus resources on training the next generation of providers. The question as to whether students can learn MI as part of their professional training is being examined, and early studies have reported encouraging results (Fortune et al. 2019; Kaltman and Tankersley 2020).

An alternative approach involves training providers who are best placed to develop skills. There is evidence to suggest that basic counselling skills prior to training predict MI skill acquisition and retention (Baer et al. 2004; Carpenter et al. 2012; Smith et al. 2012b; Moyers and Miller 2013). For example, Carpenter et al. (2012) reported that baseline skills explained 17% of the variance in post-workshop MI spirit, and 14% of the variance in MI-non adherent responses. Moyers and Miller (2013) reported results of a retrospective analysis of two RCTs of MI training (Miller et al. 2004; Moyers et al. 2008). Ratings of empathy obtained at baseline were a significant predictor of clinician empathy at the 4-month follow-up. One large multi-site RCT

used empathic skill as a hiring criterion for providers of a combined behavioural intervention involving MI (Miller et al. 2005). Miller and Moyers (2017) have made the point that in light of the potentially high cost of training providers, pre-screening for empathic counselling skills may represent a cost-effective recruitment strategy for organisations providing MI as part of their service.

4.3.2 **Can health professionals learn to use MI?**

The question as to whether health professionals can learn to deliver MI as intended is relevant to the research contained within this thesis. The model for using MI as an adjunct to PR proposed in section 7.2.3 (page 176) involves a combination of i) specific MI consultations, either delivered alongside other clinical tasks within routine appointments, or as discrete sessions, and ii) strategic, MI-based sessions introduced flexibly through PR, based on need. It is the author's contention that PR clinicians (primarily physiotherapists and nurses in the UK NHS) are best placed to deliver these sessions. The ongoing contact these clinicians have with patients through PR provides an ideal platform to forge strong, trusting relationships and renders them well placed to identify and respond in a timely way to the need for additional MI-based support. The author also believes that the underpinning style of MI may also provide a useful vehicle to deliver other elements of the programme, such as the educational sessions.

Given the argument above, an important question is whether health professionals can learn to deliver MI effectively. Whilst meta-analyses have generally failed to show a moderating effect of professional training on the outcomes of MI (Lundahl et al. 2010; Lundahl et al. 2013), these conclusions are based on comparisons across studies. Moreover, there are reasons to suspect that the impact of MI training for mental health and substance use counsellors who have been the participants in most MI training research (Barwick et al. 2012; de Roten et al. 2013; Schwalbe et al. 2014; Madson et al. 2019) may not generalise to health professionals.

As MI began to diffuse into health contexts, Resnicow et al. (2002b) have raised the point that these 'specialists' typically have prior training and experience in the use of client-centred counselling skills, which means that MI represents a "reorientation" of their existing skills (p. 449). By contrast, health professionals whose training does not routinely include counselling skills (Parry and Brown 2009; Driver et al. 2019; Fortune et al. 2019) may take more time, and need more intensive training to develop competence, because of the need to learn the basic counselling skills in addition to the elements that are unique to MI (Resnicow et al. 2002b; Rollnick et al. 2008). Relatedly, health professionals may be at a disadvantage for learning MI because of their experience using approaches to motivating clients that are antithetical to MI. De-automating tacit, well-rehearsed habits of counselling that are incompatible with MI, such as

giving unsolicited advice, is challenging (Miller and Mount 2001; Miller et al. 2004) and this difficulty may increase with years of clinical experience using those methods. At least one study has reported a positive association between clinician experience and poorer outcomes of training (Dunn et al. 2015). In light of these issues, the author completed a scoping review of evidence of the effectiveness of MI training for health professionals, which can be found in section 4.4 (page 98).

4.3.3 Performance thresholds of skill in motivational interviewing

In section 3.11 (page 56) where treatment fidelity was defined and described, reference was made to thresholds of MI competence. In the context of provider training, comparison between actual MI skill and performance thresholds may be used to guide training efforts. During a trial, such comparisons can be used to establish whether MI has been delivered as intended. This section contains a definition and explanation of performance thresholds of skill in MI.

One of the most widely used systems to assess MI competence (and the one used in study 2 reported in this thesis) is the MITI (Moyers et al. 2010; Moyers et al. 2015). Thresholds reflecting *basic competency* and *proficiency* in MI based on the MITI have been proposed (see Figure 8-4, page 199). Basic competency refers to a level of skill considered necessary to impact patient outcomes, whilst thresholds indicating proficiency reflects the skills observed in practice samples of experts in the field.

These thresholds are not empirically derived (Miller and Rollnick 2013 p. 399). As Miller and Rollnick (2014) state "it is unclear what level of MI fidelity is "good enough" to facilitate change within particular contexts or sufficient to conclude that MI was actually delivered and tested." (page 236). It is also unclear as to whether thresholds for all components of MI skill need to be achieved concurrently for practice to be considered 'good enough' and whether there are some elements that are more important to outcome than others (Apodaca 2016; Apodaca et al. 2016). Another unanswered question is whether the thresholds differ across behavioural targets, contexts and the specific way in which MI is used (for example as a prelude to another intervention, or as a standalone treatment). More process research linking clinician MI skills to client outcomes in different contexts is required before more definitive conclusions can be drawn.

4.3.4 Models of skill development

One limitation of MI training research has been the failure to use a theoretical framework to guide training efforts. Such frameworks have potential to maximise the effectiveness and efficiency of training and can help to explain the challenges that clinicians experience whilst

developing their skills. Two models have been described that have potential in this regard: the 'eight stages of learning motivational interviewing' model (Miller and Moyers 2007), and the 'declarative-procedural-reflective' (DPR) model (Bennett-Levy 2006).

4.3.4.1 Eight stages in learning motivational interviewing

The 'eight stages' model was developed by Miller and Moyers (2007) based on their research and training experiences and involves a logical sequence of eight steps in developing MI skills: 1) becoming familiar with its humanistic underpinnings and an openness to a collaborative, evocative and autonomy respectful style of working, 2) developing client-centred counselling skills including accurate empathy, 3) recognising change talk, 4) eliciting and strengthening change talk, 5) diffusing client's arguments against change and defensiveness, 6) developing a change plan, 7) consolidating client commitment and 8) being able to integrate MI with other clinical approaches. The model also implies where clinicians can get stuck whilst learning, for example failing to relinquish the expert role (stage 1).

The model provides a framework for conceptualising the content of MI training and has been used to describe the structure and focus of learning activities within two systematic reviews (Madson et al. 2009b; Söderlund et al. 2011), though it has not been empirically validated. Whilst reference is made to stages of learning, it is not a true stage model. As the authors point out, the accomplishment of each step in the sequence is not necessarily contingent on having mastered those which precede it (Miller and Moyers 2007, p.14).

4.3.4.2 Declarative-procedural-reflective model

The declarative-procedural-reflective (DPR) model takes an information processing perspective to map the processes involved in acquiring and refining therapy skills (Bennett-Levy and Thwaites 2007; Bennett-Levy et al. 2009a; Bennett-Levy and Finlay-Jones 2018). The model was originally developed in the context of CBT and has been used to underpin several CBT training studies (Bennett-Levy et al. 2009a; Burgess et al. 2013; Watkins and Scaturo 2013; Davis et al. 2015). Bennet-Levy has argued it is relevant to psychotherapeutic approaches from other orientations (Bennett-Levy 2006; Bennett-Levy and Thwaites 2007). Whilst cursory links have been made to learning MI in a study involving health professionals treating patients with chronic health conditions (Wallace 2011), the author of this thesis did not find any studies that have explicitly used the DPR model to underpin MI training research.

The DPR model comprises three interacting systems: declarative (knowledge and understanding about the intervention), procedural (use of skills in action) and reflective (reflecting on practice to develop and refine declarative knowledge and procedural skills).

Within Appendix D (page 343) is a description of the DPR model in relation to learning MI and a diagram (Figure D1) showing the relationship between its components.

In short, the model comprises a taxonomy of skills and provides insights and explanation as to how different skills develop and why they develop at different rates (Bennett-Levy 2006). Interpersonal perceptual skills are described as being central to skilful practice. In MI they enable the clinician to be receptive and responsive to patients on a moment-to-moment basis, whilst being mindful of their own aspirations for patients, and not allowing those things to interfere with the helping process. When-then-rules, plans, procedures and skills are highly contextualised, flexible decision rules that indicate when and how particular strategies and skills should be used and are a hallmark of expert practice (Bennett-Levy 2006). A distinction is made in the DPR model between the 'person of the therapist (self-schema)' and 'the therapist self (self-as-therapist schema)' (Bennett-Levy 2006; Bennett-Levy and Thwaites 2007; Bennett-Levy et al. 2009b). The self-schema comprises 'the knowledge, attitudes, skills and personal attributes that have been established prior to becoming a therapist' (Bennett-Levy 2006 p. 65), which for existing clinicians will include those elements derived through professional training and clinical practice. The model identifies the impact of the self-schema on skill development. For a more detailed description of the model and its background, the reader is referred to Bennett-Levy (2006).

The DPR model has several advantages over the eight stages model for guiding training input and explaining training outcomes. Rather than focusing on what needs to be learnt, it articulates the relationship between different types of skills (perceptual, interpersonal, conceptual and technical) and elucidates the mechanisms involved in skill development. Moreover, the model describes how training content, training process and learner characteristics interact in the process of acquiring and refining skills. For example, it conceptualises how knowledge, skills, attitudes and beliefs that have been established prior to therapy training (the self-schema in DPR parlance) influence the development of key components of therapy skill (Bennett-Levy 2006). This is particularly relevant to the current programme of research since most of the clinicians involved (primarily nurses and physiotherapists) do not have prior training in patient-centred counselling skills and much of their routine practice is underpinned by beliefs and assumptions that conflict with MI principles. The insights provided by the model can therefore help to predict the challenges these groups are likely to face when learning MI and the specific training input that will be most helpful for developing specific skills.

In Table 7-2 (page 184) there is a summary of how the DPR model was used to refine the training package used in study 2 (learning MI) and in the discussion section of study 3 (trainee

experiences), the model was used to make sense of participants' training experiences (see section 9.5, page 286).

4.4 Scoping review: The effectiveness of motivational interviewing training for health professionals

Prior to testing the effect of MI as an adjunct to PR it is necessary to determine whether the clinicians who would be responsible for delivery can do so competently. It is the author's contention that PR clinicians (primarily physiotherapists and nurses) are best placed to fulfil this function. Traditionally, nurses and physiotherapists do not have counselling backgrounds and maybe at a relative disadvantage for acquiring MI skills, a point that was raised in section 4.3.2 (page 94).

To enable judgments about potential skill acquisition and the quantity and type of training required to promote basic competency in MI for these professionals, the author of this thesis completed a scoping review of evidence. A preliminary review highlighted that there is a paucity of research testing the effectiveness of MI training for PR clinicians. Therefore, the decision was made to explore research examining the impact of MI training for any type of health professional. This involved identifying review level evidence initially, followed by a review of relevant primary research.

Table 4-6 *Summary of Scoping Review of the Effectiveness of Motivational Interviewing (MI) Training for Health Professionals*

Review questions	Level of evidence	Detail and justification
1) Is MI training effective for increasing health professionals' MI skills? 2) What are the most effective training strategies? 3) Can health professionals develop basic competency in MI?	Systematic review	Initial search for review level evidence of MI training for health professionals involving objective measure of MI skill.
	Primary research	Only one systematic review was identified, which included studies published to May 2010. Limited use of individualised supervision and objective outcome measures in reviewed studies. Review of primary research published after May 2010 deemed necessary to gain further insights about comprehensive training packages on objective measures of MI skill.

Note. PR = pulmonary rehabilitation; RCT = randomised controlled trial.

4.4.1 Review questions

1) Is MI training effective for increasing health professionals' MI skills?

2) What are the most effective training strategies?

3) Can health professionals develop basic competency in MI?

4.4.2 Systematic review level evidence

4.4.2.1 Search strategy

Systematic reviews of MI training for health professionals that have objective measures of MI skill as the outcome measure.

Inclusion criteria:

- MI training for health professionals only;
- Either narrative reviews or meta-analytic reviews;
- Full paper available (not abstract only or unpublished doctoral dissertations).

Exclusion criteria:

- Included studies focused on training for non-health professionals (e.g. psychologists, substance use counsellors, lay counsellors and peer counsellors) with results that were pooled with those for health professionals;
- Training in derivatives of MI such as Behaviour Change Counselling.

The thesis author's prior knowledge of the literature in this area recognised learners' profession as a factor that may influence MI skill development. The decision was made therefore, only to include reviews of evidence focused on the impact of training for health professionals, to remove professional group as a potential covariate. It was also considered appropriate to exclude those reviews that included studies in which interventions were described as derivatives of MI. This was because the programme of research contained within this thesis is concerned with the feasibility of MI in its *pristine* form and it is not known if, or how, training outcomes for adaptations of MI may differ from those focused on learning the original method.

Four electronic databases were searched for relevant systematic reviews from April 1983 until October 2019. The strategy was initially developed for articles published in English language for Ebsco MEDLINE and subsequently adapted for Ebsco PsycINFO, Ebsco CINAHL Plus and the Web of Science Core Collection. Search terms were mapped to subject headings as keywords or MeSH terms where relevant.

The search term motivational interviewing ("motivational interviewing") was combined with training (training OR education OR learning) and health professionals (allied health professional OR health professional OR health care professional OR nurse OR physiotherapist) using the AND Boolean operator. Truncated forms of these terms were included. The search filter was used to identify systematic reviews including those with meta-analysis as identified within the published reports. Other information sources were used to supplement those identified by the database search. This involved checking the reference lists of research retrieved and a review of the bibliography page on the MI website (http://motivationalinterviewing.org/motivational-interviewing-resources).

4.4.2.2 Results

4.4.2.2.1 Selection of systematic reviews

The PRISMA flow diagram shown in Figure 4-3 provides a summary of the records of systematic reviews identified, which ones were included and the point at which exclusions occurred.

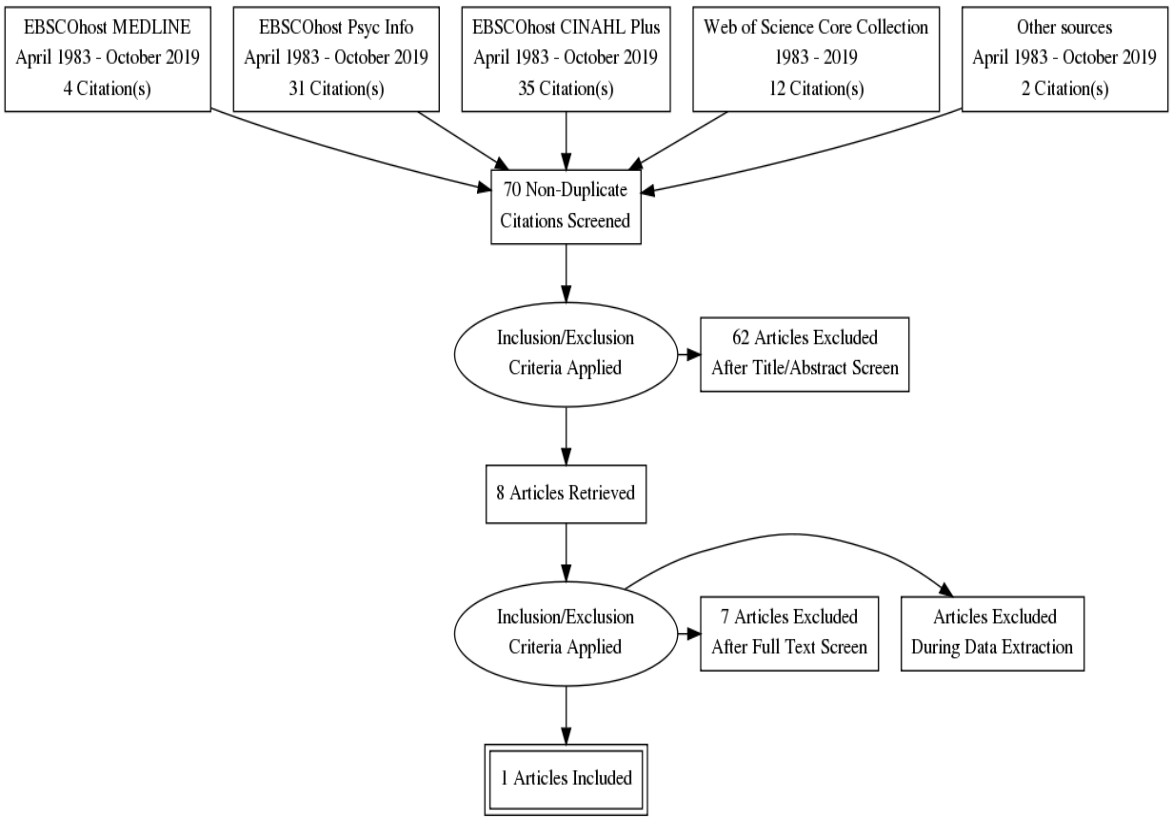


Figure 4-3. PRISMA flow diagram of search for review level evidence of motivational interviewing training for health professionals that have objective measures of skill as the outcome measure.

4.4.2.2.2 **Systematic review characteristics**

One narrative review met the inclusion criteria (Söderlund et al. 2011). A summary of the characteristics of this review is provided in Table 4-7 (page 102).

Table 4-7 *Characteristics and Main Findings of a Systematic Review of Motivational Interviewing (MI) Training for General Healthcare Practitioners*

PRISMA item	Finding
Objective	Review of empirical studies that have evaluated different aspects of MI training for general healthcare professionals. Aim to investigate the content and outcomes of training.
Eligibility criteria	Inclusion criteria: • Studies published in English; • Involving general healthcare practitioners (e.g. physicians, nurses and dieticians) working in general (primary) healthcare; • Training focused specifically on MI; • Study provided 'sufficient' detailed description of MI training, overview of training environment, methods used, duration, population trained and outcomes; • Training specifically provided for general healthcare practitioners planning to or already using MI in practice. Exclusion criteria: • Students; • Practitioners working in specialist settings e.g. substance use treatment or mental health facilities.
Assessment of study quality or risk of bias	A study specific 7-point scale was used to assess reporting and methodological quality. Level of study design assessed with Maryland Scale of Scientific Methods (1998). This measures threats to internal validity with each study being ranked from level 1 (lowest internal validity) to level 5 (highest internal validity).
Results	
Number of studies included	10 (published in 11 papers)

PRISMA item	Finding
Study characteristics	*Study design:* Review does not provide detail on all studies. *Sample size:* n= 7 – 87. *Population:* A variety of health professionals most commonly physicians and nurses working in primary care, with others in acute care, homecare organisations, maternity care, and child healthcare and school health services. *Intended use of MI:* Counselling for a variety of issues, including general lifestyle issues, smoking, alcohol, medication adherence, weight, diet, and physical activity. *Training intervention:* Duration: Varied from 20-minutes to 24-hours. Median length approximately 9-hours. Type of training: 9 studies involved a workshop, 1 study used video instruction and 5 studies provided follow-up training. Content: 1) becoming familiar with its humanistic underpinnings and an openness to a collaborative, evocative and autonomy respectful style of working (N=9); developing client-centred counselling skills including accurate empathy (N=10); 3) recognising change talk (N=8); 4) eliciting and strengthening change talk (N=4); 5) diffusing client's arguments against change and defensiveness (N=7); 6) developing a change plan (N=3); 7) consolidating client commitment (N=1); 8) being able to integrate MI with other clinical approaches (N=9). *Outcomes:* Participant reactions to training by interview (N=1) or questionnaire (N=3); MI competence (N=4); clinical use of MI by interview (N=2), questionnaire (N=3) or interview and questionnaire combined (N=2); patient level outcomes assessed with patient questionnaires (N=2) and physical measurements (N=1). *Follow-up period:* Immediately post training (N=10); Longer-term follow-up (3-months – 1-year post training) (N=6).

PRISMA item	Finding
Risk of bias and external validity	All 10 studies failed to report on potential differences between those receiving training and those who did not participate or withdrew. Two studies failed to report participation rates, 8 studies did not report statistical power, 5 studies did not report *p* values, 6 studies did not use validated instrument to assess training outcomes. Level of study design assessed with Maryland Scale of Scientific Methods (1998): level 1 (lowest internal validity) N=5; level 2 (N=1); level 5 (N=4). Low external validity (study samples typically reflecting those who were most motivated to learn MI).
Results of individual studies	*Reaction to training:* Generally favourable perceptions reported (N=4). *MI competence:* Significant differences between experimental and control groups in demonstration of relevant MI skills (N=3); No difference in outcome between participants learning MI using simulated patients or by colleague (N=1). *Clinical use of MI:* Majority reported that participants were on average using MI in some of the skills that are central to it and believed that it was enhancing their practice (N=7). Barriers to MI use (time constraints, difficulties in its use with less motivated patients (N=5). *Patient health outcomes:* Patient self-report questionnaires reported favourable results (N=2). Variable effects on patient outcomes (saturated fat intake, glycated haemoglobin, BMI or waist circumference) (N=1).
Discussion	
Summary of evidence	Outcomes of training were generally positive. MI best learnt through workshop training of sufficient duration with follow-up or supervision, applying MI in routing practice and practicing on one's own and with a coach or colleague. Low methodological quality and heterogeneity of studies makes it difficult to draw unambiguous conclusions.

Note. N = number of studies; PRISMA = Preferred reporting items for systematic reviews and meta analyses. Adapted from "A systematic review of motivational interviewing training for general health care practitioners" by LL Söderlund, MB Madson, S Rubak and P Nilsen (2011). *Patient Education and Counseling* 84(1): 16-26.

The review included 10 studies with sample sizes between seven to 87 participants. Three were RCTs with trainees randomly allocated to MI training or control usually involving general lifestyle related training. Two involved pre-post assessments to measure changes following training. MI training interventions varied across studies, ranging from a 20-minute video to a 2-day workshop and 1-day follow-up totalling 24-hours. Median duration of training was 9-hours. Five studies involved follow-up training. Outcomes assessed included participants' reactions to training, MI competence, clinical use of MI and patient health outcomes. Two studies used a validated instrument to assess MI skills and one study reported the impact on objectively measured patient outcomes. All studies measured outcomes post-training, with latencies varying from immediately following training to five-years later. Most assessed outcomes one to 6-months after the training.

4.4.2.2.3 **Methodological quality of reviewed studies**

Study quality varied across the 10 studies and is summarised in Table 4-7 (page 102). The majority used study designs that were not capable of determining the impact of training and had a high risk of bias. External validity was also considered to be low.

4.4.2.2.4 **Outcomes: main effects in relation to the research question**

The main review findings are summarised in Table 4-7 (page 102). The review authors reported that overall, the training resulted in positive outcomes. On measures of MI skill, one study evaluated the impact of MI training using a validated measure, reporting significant differences between experimental and control groups. Another measured the impact of learning MI through use of a simulated patient or by training with a colleague but found no difference. Two studies that measured the impact of MI training on patient self-reported outcomes reported positive effects. One of those studies also used objectively measured patient outcomes but found no effect.

A combination of low methodological quality and the heterogeneity of reviewed studies made it difficult to draw unambiguous conclusions though. Only one study measured pre-post training outcomes using a valid and reliable measure of MI skill. Whilst other outcomes such as participants' reactions to training and confidence in using MI were assessed, it is objective ratings of competence that predict patient behaviour change following MI (Thyrian et al. 2007; Gaume et al. 2009; Moyers et al. 2009; Daeppen et al. 2010; Cox et al. 2011). Moreover, the authors noted that the low external validity means that the results reflect outcomes for the most motivated clinicians who are keen to learn the approach.

4.4.2.3 Discussion of systematic review level evidence

Söderlund et al. (2011) concluded that the review findings provide evidence of the potential of MI training for developing health professionals' MI skills and indicates the importance of follow-up training support.

The findings of Söderlund and colleagues' review provide some preliminary answers to two of the questions posed in section 4.4.1 (page 99). Specifically: 1) Is MI training effective for increasing health professionals' MI skills? and 2) What are the most effective training strategies? However, there is a pressing need for higher quality studies that are capable of measuring the impact of training on objectively measured skill acquisition and retention. The need for improvements in methodological quality within MI training studies has been raised within other systematic reviews (Madson et al. 2009b; de Roten et al. 2013; Schwalbe et al. 2014).

Moreover, at the time the Söderlund et al. review was conducted, the research evidence did not include any studies involving PR clinicians, and there was insufficient evidence as to whether training leads to basic competency in MI and if so, how much of what type of training is necessary?

4.4.3 Primary research: The effectiveness of motivational interviewing training for health professionals

4.4.3.1 Rationale

The systematic review reported by Söderlund et al. (2011) included research published up to May 2010 and did not include any studies that involved clinicians responsible for PR delivery. Five of the 10 reviewed studies included follow-up support within the training package, of which only two offered individualised input. Moreover, only two studies included objective measurements of skill to quantify the impact of training. The thesis author therefore considered it necessary to conduct his own review of primary level evidence published after this systematic review, to gather further insights about the potential impact of more comprehensive training packages.

The eligibility criteria for this scoping review of primary studies are specified in the next section. The author deemed it important to focus on those studies that have incorporated individualised supervision (for example coaching and feedback on practice) as part of the training package. This was necessary given the value of on-going training support highlighted by Söderlund et al. (2011) in the review of training studies for health professionals, as well as in systematic reviews

of MI training for other professional groups (Barwick et al. 2012; de Roten et al. 2013; Schwalbe et al. 2014; Madson et al. 2019).

4.4.3.2 Search strategy

Primary research of MI training for health professionals that includes individualised follow-up support as part of the training package and reports outcomes of objective measurements of MI skill.

Inclusion criteria:

- Trials with objective ratings of MI skill obtained prior to and after training using a validated measure such as the MITI, MISC or BECCI;
- Training includes individual supervision (e.g. coaching and systematic feedback);
- Full paper available (not abstract only or unpublished doctoral dissertations).

Exclusion criteria:

- Non-health professionals e.g. psychologists, addictions counsellors, lay or peer counsellors, students (including pre-registration health professionals);
- MI training targeted alcohol, substance misuse or mental health problems;
- Training in derivatives of MI such as behaviour change counselling;
- Technology delivered training.

Four electronic databases were searched for relevant primary research studies from May 2010 until October 2019. The strategy was initially developed for articles published in English language for Ebsco MEDLINE and subsequently adapted for Ebsco PsycINFO, Ebsco CINAHL Plus and the Web of Science Core Collection. Search terms were mapped to subject headings as keywords or MeSH terms where relevant. The search terms motivational interviewing ("motivational interviewing"), health professionals ("allied health professional" OR "health professional" OR "health care professional" OR "nurse" OR "physiotherapist"), training ("training support" OR "inservice training" OR "training" OR "education" OR "learning" OR "teaching"), supervision ("supervision" OR "mentoring" OR "coaching" OR "feedback" OR "systematic feedback") were combined using the AND Boolean operator. Truncated forms of these terms were included.

Other information sources were used to supplement those identified by the database search. This involved checking the reference lists of research retrieved, a review of the bibliography page on the MI website (http://motivationalinterviewing.org/motivational-interviewing-resources) and e-mail contact with several researchers involved in MI research.

4.4.3.3 Results

4.4.3.3.1 Selection of studies

The PRISMA flow diagram shown in Figure 4-4 (page 108) provides a summary of the primary research identified, which studies were included and the point at which exclusions occurred.

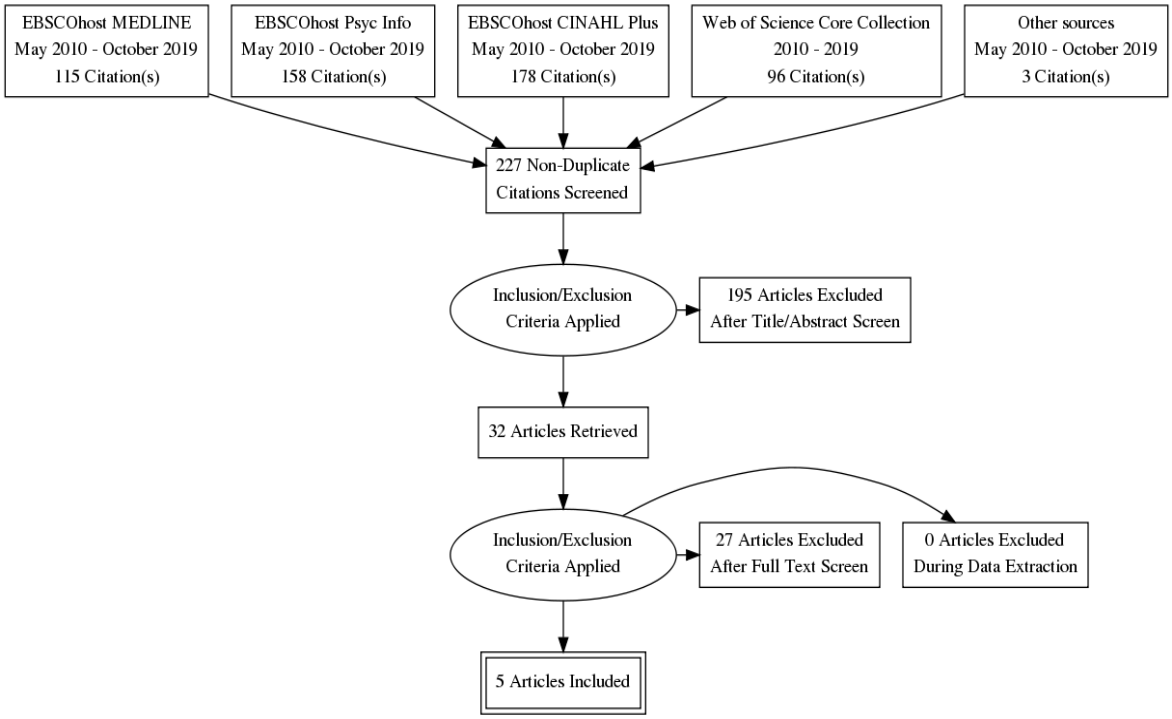


Figure 4-4. PRISMA flow diagram of search for primary research testing the effect of motivational interviewing training for health professionals on objectively measured skill.

4.4.3.3.2 Study characteristics

The search strategy yielded published reports of five studies. The design characteristics of each study are summarised in Table 4-8 (page 111). Fourteen articles were excluded on the basis of their not reporting baseline measurements of MI skill, thus precluding the assessment of change through training. These 14 articles reported treatment fidelity within 13 RCTs of MI in health contexts and otherwise met all eligibility criteria. The insights gained are therefore relevant to the third review question 'Can health professionals develop basic competency in MI?' (section 4.4.1, page 99). Information regarding training input and post-training skills from these 13 studies is summarised in Appendix B (page 327), with the results discussed and synthesised with those of the five training studies in sections 4.4.3.4.3 (page 119) and 4.4.4 (page 121).

Study design and sample size

Reviewed studies included: a pilot RCT comparing workshop training with follow-up supervision to workshop training alone (Beach et al. 2018); two RCTs, one comparing web-enabled video feedback with a delayed training control (Noordman et al. 2014) and a second evaluating the additive effect of booster sessions over workshop training (Fu et al. 2015); a pilot naturalistic study comparing workshop training and follow-up supervision with workshop training alone (Victor et al. 2019); and a before after single group evaluation of workshop training and follow-up supervision (Dobber et al. 2019). Sample sizes ranged from 12 to 143 participants (total n= 233), three studies involved 24 participants or fewer.

Trainee professional backgrounds

A range of health professionals were represented; nurses (27%); paediatric health care providers (mix of professions) (61%); pharmacists (7%); physicians and physician assistants (8%).

Trainees' and trainers' backgrounds and motivational interviewing experience

The proportion of participants who had received prior MI training was reported in four of the five studies (80%) and ranged from 17% (Beach et al. 2018) to 65% (Noordman et al. 2014). One study provided details regarding the amount of prior training received (Noordman et al. 2014), which varied between one half day to 6-days.

Details regarding MI trainer credentials varied across reports. One noted that the provider was a member of the Motivational Interviewing Network of Trainers (Beach et al. 2018) and another that the trainer was an 'MI expert' (Dobber et al. 2019). Fu et al. (2015) used two clinical psychologists for training delivery, each with 'several days of training' in MI facilitation and coaching skills. These individuals were supported by six 'MI champions', each with 3-days of MI training. Victor et al. (2019) did not provide details of trainer credentials in the published report but contact with the corresponding author revealed that the trainer was a clinical psychologist who had completed a 1-year National Institutes of Health funded programme for MI training and dissemination (MA Faith, personal communication, November 22, 2019).

Setting characteristics

Studies took place in a variety of settings: medical centre (Beach et al. 2018); outpatient hospital clinics (Dobber et al. 2019); primary care (Noordman et al. 2014; Fu et al. 2015); and paediatric hospital (Victor et al. 2019).

Format and duration of training

All studies provided details regarding the training intervention. Four studies provided workshop training ranging from 3-hours to 1-day ahead of follow-up training support (Fu et al. 2015; Beach et al. 2018; Dobber et al. 2019; Victor et al. 2019). All studies involved feedback and / or coaching support. This input ranged from access to video recordings of consultations together with a single one-hour face to face feedback session based on an objective evaluation of the participant's skills (Noordman et al. 2014) to 10, 2-hour group-based learning sessions over 14-weeks with supplementary feedback reports based on objective analysis of mock interviews completed during each session (Victor et al. 2019). One study described the content of follow-up training in detail, but did not specify the duration of each session (Beach et al. 2018).

Three studies used objective measurements of MI skill to underpin training feedback sessions. Instruments used for feedback purposes were the BECCI (Noordman et al. 2014), MITI 4.2.1 (Victor et al. 2019) and the MITS 2.1 (Dobber et al. 2019).

Training evaluation

Three studies used actual patient sessions to evaluate training outcomes (Noordman et al. 2014; Beach et al. 2018; Dobber et al. 2019) and two studies used role-played sessions (Fu et al. 2015; Victor et al. 2019). Across studies there was variation in the number of MI-sessions that were used to derive measurements of participants' MI skills at each time point. This ranged from one per assessment point (Dobber et al. 2019; Victor et al. 2019) to 10 (Noordman et al. 2014).

Various instruments were used to evaluate MI skills. These were the BECCI (Noordman et al. 2014); MITI 3.1.1 (Fu et al. 2015); MITI 4.2.1 (Victor et al. 2019); and the MITS 2.1 (Dobber et al. 2019). Beach et al. (2018) used the MITI 2.5 to evaluate participants' MI skills in sessions with actual patients and the CLAMI was used to evaluate the impact on elements of patient language (change talk and commitment language).

Table 4-8 *Characteristics and Main Findings of Primary Research Testing the Effectiveness of Training in Motivational Interviewing (MI) for Health Professionals*

Trial	Target	Sample	Intervention group	Control	Trainer credentials	Training delivery	Evaluation	Outcome measure	Result	Author conclusions
Beach et al. (2018)	HIV care	n=12 physicians, nurses, physician assistant.	1-day MI workshop + 3-5 rounds of personalised written and verbal feedback on recorded consultation over 4-months. n=6	1-day MI workshop n=6	MINT Trainer n=1	n=11 attended workshop Mean feedback sessions 4.5	Pre-workshop and 6-months post workshop audio recordings of practice. 8-patients per clinician participant. Nurses aware of sessions being recorded. Analysis of training effectiveness based on full (pre-post) data sets (available for n=9).	MITI (2.5) and CLAMI	MITI scores: Overall increase for total reflections (p= .02); complex reflections (p< .01), but no between group differences (all ps> .05). No change for MI-adherent, MI non-adherent behavours (all ps> .05). CLAMI: Workshop group improved on patient change talk (p< .05). Between group differences on commitment language favouring workshop (p= .04).	Several elements of skill developed. Workshop training alone as effective as enhanced training.

Trial	Target	Sample	Intervention group	Control	Trainer credentials	Training delivery	Evaluation	Outcome measure	Result	Author conclusions
Dobber et al. (2019)	Coronary artery disease secondary preventi-on	n=24 cardiac care nurses.	3-hour MI workshop (delivered prior to baseline measurement + 4 x 15-30 minute telephone feedback/ coaching sessions over 12-months based on recorded patient sessions.	N/A	MI expert n=1	n=13 completed all training; n=2 completed 3 recordings/ feedback sessions; n=7 completed 1 recording/ feedback session.	Improvement from baseline (4-months post workshop) to post-training 12-months. Single, pre-selected patient session audio-recorded at each time-point. Nurses aware of session being recorded.	MITS 2.1	n=13 completers median increase in MITS score 7 (95% CI: 2.2, 11.8). n=11 non-completers no improvement (median change: 0.00 (95% CI: -0.8, 0.8) n=24 all nurses no improvement (median change: 2 (95% CI: -0.9, 4.9).	Improvement in study completers described as clinically important (from demonstrate-ing 'a small part MI practice' to 'mainly sufficient degree of MI consistent practice'.

Trial	Target	Sample	Intervention group	Control	Trainer credentials	Training delivery	Evaluation	Outcome measure	Result	Author conclusions
Fu et al. (2015)	Tobacco use	n=34 physicians, physician assistants, nurses, pharmacists.	Single 1/2 -day workshop + self-study materials + 6 x 1-hour booster sessions over 12-weeks incorporating peer-coaching (from 'MI champions') and telephone-based simulated interactions. n=18	Single 1/2 -day workshop + self-study materials. n=16	MI expert trainers n=2 clinical psychologists several days of training' in MI, facilitation and coaching skills. *MI Champions* n=6, 3-days of training.	Six booster sessions attended by 78% of participants.	Changes in skill between baseline, and 12-weeks after workshop. Two simulated consultations (OSCE) at each assessment point.	MITI 3.1.1	Significant difference favouring intervention group for global ratings of evocation, collaboration, MI spirit and summary measures of percent open questions, percent MI-adherent (all *p*s < .05). No significant differences for global ratings of direction and empathy and summary measures of percent complex reflections and reflection to question ratio (all *p*s > .05).	Training was effective and efficient in enhancing provider MI skills.

Trial	Target	Sample	Intervention group	Control	Trainer credentials	Training delivery	Evaluation	Outcome measure	Result	Author conclusions
Noordman et al. (2014)	People with or at risk of chronic illness	n=20 primary care nurses.	Web-enabled video feedback including access to 2-consultations and 1 x 1-hr face to face feedback session based on objective analysis. n=10	Delayed interventi-on (web-enabled video feedback provided after the study. n=10	No information provided about the 2 trainers.	n=10 (100% intervention group) received training.	Baseline to post-training follow-up with 3-6 months between (i.e. 1-2 months post training). 10 consultations per nurse at each time-point. Nurses aware of sessions being recorded.	BECCI	Study completers Intervention group scored higher on agenda setting and permission seeking' relative to controls (p= .01). No difference on other domains and BECCI mean sum score (all ps > .05).	Intervention insufficient to improve most MI skills measured by the BECCI.

Trial	Target	Sample	Intervention group	Control	Trainer credentials	Training delivery	Evaluation	Outcome measure	Result	Author conclusions
Victor et al. (2019)	Paediatric care	n=143 medical provider, mental health provider, medical support staff.	4-hr workshop + 10 x 2-hr learning sessions over 3.5-months with individual feedback on MTI analysed role-play sessions. n=20	4-hr workshop n=123	Clinical psychologist completed 1-year NIH funded programme for MI training and disseminati-on[a].	1 of 20 from advanced training programme withdrew. Remainder completed 8-10 sessions[a].	Mock patient sessions (1 at baseline and at each of 10 learning sessions.	MITI 4.2.1	Analysis of skill completed for advanced training group: 80% of advanced group participants achieved proficiency and 100% basic competency by end of the course (defined by the achievement of all MITI targets concurrently on two concurrent mock patient sessions)[a].	MI workshop sufficient to increase learner knowledge and confidence, but MI skill depends on advanced training.

Note. BECCI = Behaviour Change Counselling Index; CI = confidence interval; CLAMI = Client Language Assessment of Motivational Intent; MINT = Motivational Interviewing Network of Trainers; MITI = Motivational Interviewing Treatment Integrity coding instrument; MITS = Motivational Interviewing Target Scheme; NIH = National Institutes of Health; OSCE = objective structured practical examination; RIAS = Roter Interaction Analysis System.

[a] MA Faith, personal communication (November 22, 2019).

4.4.3.3.3 **Methodological quality of individual studies**

The risk of bias within the four controlled studies was evaluated using the PEDro scale and involved the process described in 4.2.2.4.3. Two trials were rated as low quality and two were of a moderate quality (see Table C-2. Appendix C, page 339). The risk of bias within the uncontrolled, before-after study (Dobber et al. 2019) was evaluated using relevant items from the Downs and Black (1998) checklist (see Table C-3. Appendix C, page 339). Four of the eight criteria were met.

Three of the four controlled trials involved random allocation to intervention and control groups (Noordman et al. 2014; Fu et al. 2015; Beach et al. 2018) only one of which used concealed allocation (Fu et al. 2015). The other study was described as a naturalistic study in which group membership was determined by participants' interest in obtaining further training following workshop participation (Victor et al. 2019). Two of the controlled trials completed assessments of participants' MI skills blind to group (Fu et al. 2015; Beach et al. 2018).

Eligibility criteria and study uptake was specified in one study (Fu et al. 2015). This was a convenience sample of 34 participants (of 193 eligible). The uncontrolled study was a training evaluation nested within an effectiveness trial of MI for patients with coronary artery disease (Dobber et al. 2019). The published report indicated that all participating nurses had provided MI within the main trial, but it was not clear what proportion of the MI providers were represented within the training study. Another trial involved clinicians attending for training provided by the paediatric hospital in which they worked (32.9% of whom had indicated they were required to do so by their department). No other details were provided about how trainees were recruited or what proportion of those trained consented to join the study (Victor et al. 2019). Noordman et al. (2014) reported information regarding the recruitment of host practices and that participants all volunteered to take part, but they did not give details about the number of nurses employed within those organisations who were approached and did not take part. One trial indicated that 100% of clinicians approached within an urban medical centre consented to join the study (Beach et al. 2018).

Information pertaining to the amount of planned training actually received was provided for all studies. Beach et al. (2018) reported mean number of follow-up sessions attended was four and a half (of a planned three to five sessions). Dobber et al. (2019) reported that 13 of 24 (54%) nurses completed all four feedback and coaching sessions, two (8%) completed three sessions, two (8%) completed two sessions and seven (29%) completed one session. Noordman et al. (2014) reported delivery of the single video feedback session to all 10 practice nurses in the intervention group. Victor et al. (2019) reported that of the 20 participants who elected to

participate in follow-up training, one withdrew. All other participants attended for at least eight sessions. Fu et al. (2015) reported that the six booster sessions were attended for by 78% of intervention group participants.

4.4.3.3.4 **Main findings**

The results of each study are summarised in Table 4-8 (page 111). Overall, the training packages resulted in mixed outcomes.

Change in motivational interviewing skill

Positive outcomes were reported in two studies. Victor et al. (2019) reported that 80% of advanced training participants had achieved proficiency in MI by the end of training and 100% had achieved basic competency (defined *a priori* as achieving all relevant MITI 4.2.1 thresholds on two consecutive mock consultations).[23] Dobber et al. (2019) observed improvements in overall MITS scores amongst those who completed all four follow-up telephone feedback and coaching sessions. This effect was not observed amongst those who did not complete the training package or when the entire cohort was considered.

Mixed findings were evident in two studies. Fu et al. (2015) reported significant differences favouring the intervention group for global ratings of evocation, collaboration, MI spirit and summary measures of percent open questions, percent MI-adherent. No significant differences were found for global ratings of direction and empathy and summary measures of percent complex reflections and reflection to question ratio though. Noordman et al. (2014) reported improvements in the 'agenda setting and permission seeking' elements of the BECCI analysis following a single web-enabled feedback session relative to waiting-list controls, but no differences were observed on other domains of the BECCI or on overall scores.

One study reported no effect of follow-up training. Beach et al. (2018) compared the effects of a one-day MI workshop, with or without three to five rounds of feedback on practice. Improvements in the frequency and quality of reflective listening were observed across the entire sample, but there was no additive effect of the follow-up training and the authors did not report outcomes for the other dimensions of MI practice assessed by the MITI.

[23] MA Faith, personal communication (November 22, 2019).

Clinical significance of training outcomes

Two studies reported results of MITI analysis that allowed comparison with basic competency thresholds to establish whether improvements in MI skills were clinically meaningful.[24] Victor et al. (2019) reported that the proportion of participants achieving basic competency (a level of skill that is considered to make a difference to patient outcomes) and the higher standard of proficiency (expert practice) increased throughout the course of follow-up training. Following completion of all 10 coaching and feedback sessions, 80% of the advanced group participants had achieved proficiency and 100% basic competency on all MITI variables.

Fu et al. (2015) reported that the mean score for the high intensity training group for global ratings of direction and percent MI-adherent achieved basic competency, but all other elements fell short.

None of the studies evaluated patient behaviour change outcomes, though Beach et al. (2018) evaluated whether follow-up training was sufficient to promote changes in patients' response to MI. The authors reported an unexpected finding in that those receiving workshop training alone evoked more change talk from their patients at post-training consultations relative to baseline, but this effect was not observed amongst those who had received follow-up training. Moreover, there was a between group differences favouring workshop only group, in the change in patient commitment talk evoked following training.

4.4.3.4 Discussion of primary research evidence

4.4.3.4.1 Summary of evidence

A systematic literature search for primary research investigating the effect of MI training for health professionals identified five studies published after the review period used by Söderlund et al. (2011). Collectively these studies provide some evidence of beneficial effects of MI training on health professionals' skills, but the results are variable and positive outcomes were not always observed. The study with highest volume and intensity of follow-up training produced the best outcomes, with all participants having achieved basic competency by the end of training (Victor et al. 2019). Studies with lower volume of training produced some positive outcomes, but only for those who completed the training package.

[24] One factor complicating the interpretation of this literature is that it is unclear what level of skill is sufficient to promote behaviour change in a given context or to conclude that MI was used (Miller and Rollnick 2014). Thresholds for basic competency have been identified, but are based on expert opinion rather than research findings (Moyers et al. 2010; Miller and Rollnick 2014). Moreover, there are several components of MI competence and an unanswered question is whether thresholds for all elements need to be achieved concurrently for practice to be considered good enough and which ones are most critical. See section 4.3.3.

It is difficult to draw strong conclusions about the effectiveness of MI training for health professionals from this body of research given the variation in training volume and methods used and differences in the way MI skills were assessed. Interpretation of this evidence is further complicated by the methodological limitations that were noted in section 4.4.3.3.3 (page 116).

4.4.3.4.2 Comparison with systematic review level evidence of motivational interviewing training

The thesis reviewed studies represent some advancement of the literature published after the systematic review period used by Söderlund et al. (2011). Published reports of the former have provided more thorough descriptions of the planned content and process of training and have reported training completion levels, which will enable replication and guide training implementation in clinical practice. In terms of evaluation, all five studies used validated measures of MI skill to evaluate training outcomes, whereas only two studies in the Söderlund et al. (2011) systematic review drew on such instruments. Moreover, two of the thesis reviewed studies used multiple (eight to 10) consultations at each assessment point to derive measures of clinician skill. This is a strength particularly for these small scale studies since MI skills following training are known to vary across consultations, with the clinician, patient and clinician-patient interaction effects potentially influencing MI skill and adherence (Imel et al. 2011; Imel et al. 2014; Dunn et al. 2016).

The importance of follow-up training highlighted by this thesis review of primary studies is consistent with the conclusion drawn by Söderlund et al. (2011). The results of this thesis review extend that initial conclusion by emphasising the importance of the volume of follow-up support, but at the same time cautioning that follow-up training for health professionals provides no guarantee of the achievement of MI competence.

4.4.3.4.3 Potential causes of variability in training outcomes

The variability in outcomes across reviewed studies was a surprise given the positive effect of follow-up support reported in systematic reviews of MI training in other contexts (Barwick et al. 2012; de Roten et al. 2013; Schwalbe et al. 2014; Madson et al. 2019). It had been anticipated that an exclusive focus on studies involving on-going training support after initial workshop training would have yielded outcomes more similar to those reported in other reviews. Issues that might account for the mixed findings include: 1) trainees' professional backgrounds and 2) the volume and / or intensity of follow-up support provided by training packages.

Trainee professional backgrounds

As described in section 4.3 (page 91), the majority of MI training studies have involved mental health and/or substance use counsellors (Barwick et al. 2012; de Roten et al. 2013; Schwalbe et al. 2014; Madson et al. 2019). A proportion of the variability in training outcomes involving those professional groups may be attributable to trainee characteristics and in particular their baseline person-centred counselling skills (Baer et al. 2004; Carpenter et al. 2012; Smith et al. 2012b; Moyers and Miller 2013). One possible reason that coaching and feedback did not yield the same improvements in skills for the health professionals involved in these studies as it has done for other professional groups, is that their basic training places less emphasis on the skills that are foundational to MI (Parry and Brown 2009; Driver et al. 2019; Fortune et al. 2019) and as such, their lower baseline counselling skill levels put them at a relative disadvantage.

Variability due to differences in training volume and type

The argument above implies that sub-optimal outcomes in the reviewed training studies may have resulted from an insufficiency of follow-up training. One study for example, involved a single feedback session only (Noordman et al. 2014) and another provided four, 15 to 30-minute telephone supervision sessions spread over a 12-month period, which may not have been enough to promote a momentum in learning (Dobber et al. 2019).

Process evaluations of MI effectiveness trials in health contexts that have reported provider training and integrity of MI delivery lend support to the importance of an adequacy of follow-up training (see Appendix B, page 327). Across 13 evaluations, the integrity of MI delivery tended to be higher in those studies involving a higher volume, frequency and duration of individualised supervision. Three studies reported that mean scores for all five components of MI that have been most consistently been linked to patient outcomes (MI spirit, empathy, percent MI-adherent behaviours, ratio of reflective listening statements to questions and percent complex reflections) surpassed basic competency criteria (El-Mallakh et al. 2012; Smith et al. 2012a; Benzo et al. 2016).[25] Trainees in Forsberg et al. (2010) and Wilson et al. (2018) achieved basic competency on four elements, falling short on percent MI-adherent and ratio of reflections to questions respectively. Each study involved large volume of individualised training support. For example, Forsberg et al. (2010) provided initial workshop training followed by supervision totalling 84 hours over two and a half years. Similarly, Smith et al. (2012a) provided 40 hours of initial MI training with weekly supervision for the duration of the study. Whilst this level of input

[25] Benzo et al. (2016) reported outcomes based on global ratings (MI spirit and empathy) only.

may be feasible within a clinical trial, the cost-effectiveness of this for broader dissemination needs to be explored.

By contrast, studies involving lower volume and or intensity of provider training typically showed little evidence of competent MI being delivered during the trial (Broekhuizen et al. 2012; Bohman et al. 2013; Enö Persson et al. 2016; Jelsma et al. 2017). For example, Jelsma et al. (2017) reported that lifestyle coaches struggled to implement MI with pregnant women to prevent gestational diabetes following provided initial workshop training and one follow-up workshop "a few months later." (p.4). This conclusion is tentative as it is based on comparison of a heterogeneous set of studies, though it is consistent with a meta-analysis of MI training (Schwalbe et al. 2014).

4.4.4 Summary and implications: The effectiveness of motivational interviewing training for health professionals

The review questions posed at the beginning of this section on learning MI were as follows:

1) Is MI training effective for increasing health professionals' MI skills?

2) What are the most effective training strategies?

3) Can health professionals develop basic competency in MI?

The conclusions drawn from a review of systematic review and primary level evidence together with insights from reports of treatment integrity within effectiveness trials, indicate that MI can be learnt by health professionals and delivered competently in some settings. There is variability in training outcomes, both across and within studies though, and not all learners achieve basic competency. What seems important to maximise skill development and refinement is that initial training is augmented with follow-up support of sufficient volume and intensity. The form of on-going support that has been most consistently linked to positive outcomes is individualised supervision involving coaching and feedback on practice.

To date there has been little research focused on MI training for respiratory clinicians in general, and for PR clinicians in particular. Benzo et al. (2013) reported post training MI skills for two respiratory clinicians as part of feasibility and pilot testing of a health coaching intervention for COPD self-management. In a subsequent RCT, MI was delivered with fidelity by these individuals (Benzo et al. 2016). The small number of MI providers limits external validity, and whilst patients were advised to attend for PR as part of the intervention, the MI was not focused exclusively on promoting engagement with the programme and adherence to physical activity recommendations.

Given the variability in outcomes across reviewed studies, it is therefore necessary to test the effect of MI training for use as an adjunct to PR in a larger group of clinicians who are representative of those delivering PR in the UK NHS.

To overcome the identified shortfalls, there is a requirement for studies that will:

- Test the feasibility and acceptability of MI delivered by PR clinicians;
- Test the effect of training of MI in its *pristine* form as an adjunct to PR, using methods described by Miller and Rollnick (2013) (rather than a derivative of the pristine method);
- Involve clinicians from a range of professional groups and with different levels of experience of delivering PR;
- Involve sufficient volume of individualised coaching and feedback on practice, delivered with enough regularity to create momentum in learning.

4.5 Limitations of evidence reviews

The two scoping reviews reported in this chapter provide important insights regarding: 1) the potential impact of MI for increasing adherence to physical activity recommendations as part of PR and 2) the impact of MI training for health professionals. The conclusions drawn provide a rationale to examine the feasibility of MI used as an adjunct to PR.

It is acknowledged that whilst both reviews employed a systematic methodology, the search strategy employed was not exhaustive. As a result, there may be reports of studies, for example unpublished or grey literature, that was not included. It should be noted that the results of reviewed studies were generally consistent, albeit there were a small number. It is not known if or how any studies that were missed would change the overall review outcomes.

4.6 Conclusion

There is a paucity of research testing the effect of MI in its *pristine* form used as an adjunct to PR. To enable judgments about the potential of this novel application therefore, the thesis author completed a review of research in related contexts. The conclusion drawn indicate that MI carries potential to enhance engagement and improve adherence to physical activity recommendations, but formal testing in the context of PR would be required prior to widespread dissemination into clinical practice. Guidelines on the development and evaluation of complex interventions (such as MI) provided by the Medical Research Council (MRC) (Craig et al. 2008; Richards and Hallberg 2015) indicate that an early stage in this process should be to

identify whether those who would ultimately be responsible for delivery in practice believe it is acceptable and feasible to do so.

There is evidence that the effectiveness of MI depends on a clinician's ability to deliver the method as intended and it has been argued that health professionals may be at a disadvantage for learning MI. There is a paucity of research evaluating the impact of MI training for clinicians who deliver PR (primarily nurses and physiotherapists in the UK NHS). Therefore, the thesis author completed a review of literature on the effects of MI training for all types of health professional to help make judgments about the likely effects for PR clinicians. This highlighted the potential of MI training, but with uncertainties as to the amount required to promote basic competency. The insights gained underscore the need to explore the effect of MI training within this group of clinicians as part of the overall assessment of feasibility.

The results of the scoping reviews gave rise to the following overarching research questions that the research contained within this thesis was designed to answer:

1) Do respiratory clinicians believe that MI is feasible and an acceptable adjunct to PR to enhance engagement and adherence to physical activity recommendations?

2) Is a tailored MI training package for PR clinicians feasible?

3) Does the training package lead to basic competency in MI?

4) What are PR clinicians' experiences of learning MI and using it as an adjunct to PR?

In the next chapter there is a description and justification for the research methodology employed to answer these research questions.

Chapter 5: Research methodology

5.1 Introduction

The argument is made within this chapter that the use of motivational interviewing (MI) as an adjunct to pulmonary rehabilitation (PR) constitutes a complex intervention. As such the research is informed by the United Kingdom Medical Research Council (MRC) guidance on the development and evaluation of complex interventions (Craig et al. 2008).

The overall aim and research tasks aligned with the MRC framework are presented within this chapter. The focus is on the examination of acceptability and feasibility, although intervention design is addressed, and consideration is given to widespread adoption and implementation throughout. There is also a description of the mixed methods design that was used to answer the research questions, together with the rationale for integrating qualitative and quantitative studies. The philosophical assumptions that guided the research design, data collection and analysis are also described.

5.2 Complex interventions

5.2.1 Definition of a complex intervention

The MRC define a complex intervention as one that comprises "a number of separate elements which seem essential to the proper functioning of the intervention although the 'active ingredient' of the intervention is difficult to specify" (Medical Research Council 2000 p.1). In addition to the characteristics of the intervention itself, the MRC states that complexity resides in the number and difficulty of behaviours required by providers or those receiving the intervention. Other dimensions include the number of groups or organisational levels targeted by the intervention, the number of outcomes possible and their variability in the target population, and the degree of flexibility and tailoring that is possible to suit local needs (Craig et al. 2008).

There is no single agreed definition of what constitutes a complex intervention though. Others acknowledge the sources of complexity identified by the MRC, but emphasise the importance of differences in the context in which an intervention is implemented and potential interactions between the intervention and the context (Hawe et al. 2004, 2008; Anderson et al. 2013).

5.2.2 Researching complex interventions

Complex interventions create several challenges for researchers, beyond those normally encountered in evaluation research (Craig et al. 2008). The MRC has provided guidance on the development and evaluation of complex interventions to address these potential issues (Craig et al. 2008). They recommend that prior to any definitive trial of effectiveness, there should be a "phased and, where necessary iterative approach" to the research process, with attention paid to intervention development, feasibility and pilot testing, evaluation and implementation (Craig and Petticrew 2013 p.585). A broad outline of these elements of the framework is shown in Figure 5-1 (page 127).

An important part of the research endeavour is to establish whether a complex intervention works in everyday practice. To support this, it is necessary to develop the intervention "to the point where it can reasonably be expected to have a worthwhile effect" (Craig et al. 2008 p.9) . This involves identifying key features of intervention based on a review of available evidence and developing a good theoretical understanding of how the intervention exerts its therapeutic effects (Sermeus 2015). The insights gained can be used to inform decision making about the degree of tailoring that is permissible to suit the local context without compromising those elements that are linked to efficacy (Hawe 2015). They can also be helpful in determining the most appropriate measures used within a process evaluation of definitive trial to monitor intervention fidelity, test causal mechanisms and to strengthen the intervention if the outcomes of the main trial are weak (Moore et al. 2015). Finally, clarity regarding the active ingredients of an intervention can support implementation efforts through guiding clinician training and quality control efforts (Miller and Rollnick 2014).

Prior to investing in a substantial evaluation, it is necessary to address uncertainties about the intervention through feasibility testing. This includes establishing whether the intervention is considered appropriate and acceptable to providers and recipients. Establishing whether it can be delivered as intended is also important and will involve exploring the facilitators and barriers to implementation, and the extent to which clinicians can develop sufficient skill. Failure to undertake these tasks risks a Type III error in a full trial (that is erroneously concluding an intervention does not work when it was not implemented appropriately).

The research contained within this thesis focuses on specific aspects of the development and feasibility elements of the framework, with consideration given to widespread adoption and implementation throughout. The author acknowledges the need to address several other issues prior to proceeding to a definitive trial, for example identifying an appropriate research design and outcome measures, addressing uncertainties with the procedure including likely

recruitment and attrition rates and further intervention development work, though these are beyond the scope of this PhD.

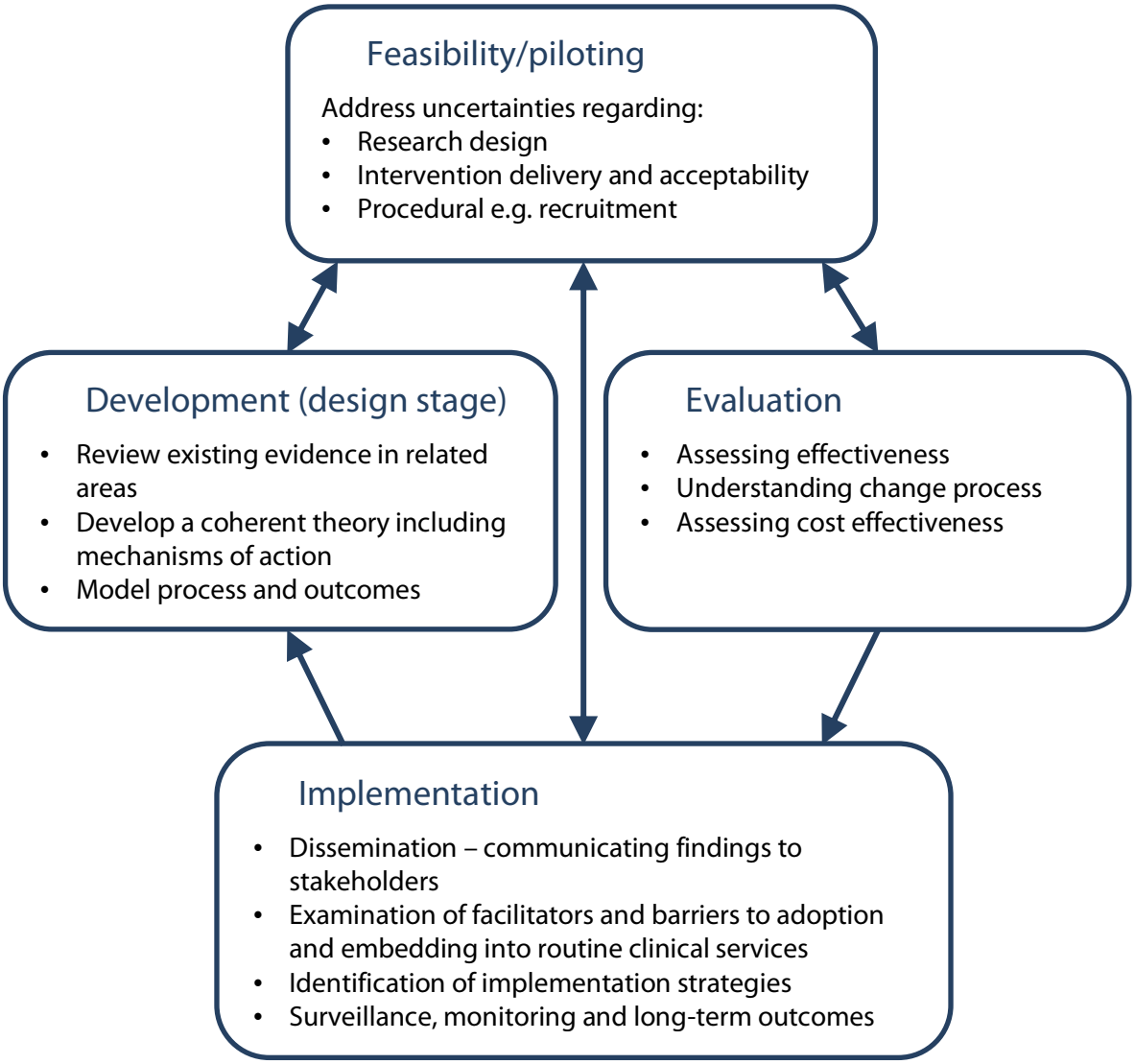


Figure 5-1. Key elements in the process of developing and evaluating complex interventions. Adapted from "*Developing and evaluating complex interventions: The new Medical Research Council guidance*" by P Craig, P Dieppe, S Macintyre, S Michie, I Nazareth and M Petticrew (2008). Medical Research Council; and "*Complex interventions in health: An overview of research methods" by* DA Richards and IR Hallberg (eds) (2015). London: Routledge.

5.2.3 Rationale for treating motivational interviewing applied to pulmonary rehabilitation as a complex intervention

According to the MRC definition, the intended use of MI as an adjunct to PR constitutes a complex intervention. Complexity resides within the method itself, the proposed delivery by PR clinicians and the requirement for integration within a multicomponent programme with sufficient flexibility to enable tailoring across services and programmes to reflect local needs.

MI is inherently complex, involving a complex set of counselling skills that are used flexibly based on moment-to-moment changes in patient response (Miller and Rollnick 2009). Manifesting the active ingredients can be challenging and the potential for variability in the integrity of MI delivery is high, leading Miller and Moyers (2017) to conclude that "psychosocial treatments [such as MI] are inseparable from the person who provides them" (p. 760).

The emphasis within complex intervention guidance is for researchers to be mindful of implementation issues during all phases of development, feasibility and pilot testing (Moore et al. 2015). The argument was made in section 4.3.2 (page 94) that the PR clinicians (primarily physiotherapists and nurses) would be best placed to deliver MI in practice were it to be adopted. Accordingly, it is necessary to establish whether PR clinicians can learn to deliver MI competently and whether it is acceptable and feasible for them to do so. That these clinicians do not traditionally have counselling backgrounds, means that learning to use MI well enough to impact patient outcomes may represent a substantial challenge (Rollnick 1996; Resnicow et al. 2002a; Miller and Moyers 2007).

Careful consideration needs to be given during the design stage of the intervention as to how MI will be used as an adjunct to PR. During PR consultations, clinicians are required to gather medical information, perform assessments and give instruction - important tasks that demand a different style of communication to MI (Rollnick et al. 2005). Using MI alongside programmes comprising elements and procedures that are antithetical to the underpinning style of MI has proven to be challenging in other contexts primarily because the elements have the potential to undermine each other (Moyers and Houck 2011; Bohman et al. 2013; Channon et al. 2016). For example Moyers and Houck (2011) reported that some trial therapists delivering a combined behavioural intervention[26] had difficulty transitioning between the initial engagement phase involving MI and treatment planning that involved more directive elements borrowed from cognitive behaviour therapy and twelve step facilitation (COMBINE Study Research Group 2003). Identifying how the seemingly disparate procedures and activities are best assimilated within the combined MI-PR model is a key task prior to formal testing (Moyers and Houck 2011).

The need for flexibility in the use of MI within PR to meet the needs of individual patients and the service environment complicates evaluation and further justifies the contention that this should be considered a complex intervention. Key requirements are that the content of the MI component of the intake consultation following referral is sufficiently flexible to meet the

[26] A combination of MI, cognitive behaviour therapy and twelve-step facilitation delivered as part of a clinical trial testing the effectiveness of two medications for heavy alcohol consumption.

individual needs of the patient and that the schedule and focus of further consultations are tailored based on the individual's response to the PR programme. This makes it difficult to discern whether the effect of the intervention is due to the skills of the MI provider, the specific content of the MI, the content of the PR programme, an interaction between these things or some other factor.

Complexity also resides within PR programmes as differences in design (for example rolling versus cohort) and delivery (duration, frequency, location) may moderate the effect of MI. Whilst standardising key elements of the intervention through treatment manuals is important for treatment fidelity purposes (Bellg et al. 2004; Miller et al. 2005; Miller and Rollnick 2014), differences across programmes call for a flexible approach that allows for tailoring to meet local needs (Hawe et al. 2004; Hawe 2015). Excessive standardising could be problematic. In one meta-analysis, the effect size of studies in which MI was guided by a manual was nearly half that of studies without a treatment manual (effect size with manual $d = 0.37 \pm 0.62$; without manual $d = 0.65 \pm 0.62$) (Hettema et al. 2005). One possible explanation is that the manualised protocols were excessively rigid and the prescription a sequence of steps did not allow those delivering the intervention sufficient flexibility to respond to the client in the moment in the way a skilful MI-provider would (Miller and Rose 2009). Psycholinguistic analysis of manualised treatment sessions in one study that reported null findings lends support to this idea (Amrhein et al. 2003; Miller et al. 2003). A requirement therefore, is to adapt the clinical method of MI into a form that is faithful to its underpinning spirit and guiding principles but can be adjusted to suit the local context without undermining efficacy (Miller and Rollnick 2014).

5.3 Research tasks aligned with the complex intervention framework

The overarching aim of the programme of research contained within this thesis was to explore the feasibility of MI used as an adjunct to PR for promoting engagement and adherence to physical activity recommendations. It was argued in section 5.2.3 (page 127) that this application constitutes a complex intervention. Therefore, in keeping with guidance from the MRC (Craig et al. 2008) and others (Richards and Hallberg 2015), prior to a definitive trial of effectiveness and widespread implementation, it is necessary to develop the intervention to the point where it is likely to have an effect and to address uncertainties relating to the intervention using feasibility and pilot studies.

Table 5-1 (page 130) contains details of the key tasks addressed by the programme of research contained within this thesis mapped to the phases of the complex intervention framework.

Table 5-1 *Key Research Tasks Aligned with the Medical Research Council (MRC) Complex Intervention Development Framework*

Element	Task	Timing
Development Construct a model of the complex intervention	Review relevant literature and consult with PR service leads to: • Develop a logic model of the problem of sub-optimal engagement with PR and poor adherence to physical activity recommendations informed by MI and self-determination theory **(see section 7.2, page 172)**.	Prior to study 1
	Use logic model of the problem, relevant literature and feedback from respiratory clinicians (study 1) to: • Propose a process flow model for using MI as an adjunct to PR clarifying what will be delivered, when, by whom and how long it will take **(see section 7.2.3, page 176 and Figure 7-3, page 179)**; • Specify aim and objectives for each intervention component and potential mechanisms of action **(see Table 7-1, page 180)**; • Develop a MI training package incorporating strategies that are likely to be most effective for developing MI skill to enable PR clinicians to deliver the proposed intervention **(see section 7.3.1, page 183)**.	Prior to study 2
	Use author's insights together with participant feedback whilst training early cohorts within study 2 to: • Support the refinement of the content of the MI intervention for use with later cohorts of trainees within study 2 **(see section 7.2.3.2, page 181)**.	Progressively through study 2
	Use author's insights and participant feedback gathered whilst training early cohorts within study 2 to: • Optimise the MI training package for use with later cohorts of trainees within study 2. Use the declarative-procedural-reflective (DPR) model (Bennett-Levy 2006) to guide the refinements **(see section 7.3.2, page 183)**.	Progressively through study 2
	Use participant feedback (study 3) to: • Provide recommendations for the MI intervention and associated training package including requirements for further testing **(see section 9.5.5, page 295, Table 10-2, page 311 and section 10.4, page 319)**.	Following study 3

Element	Task	Timing
Feasibility / Piloting Address uncertainties with the research method[a] and intervention[b]	Interview respiratory clinicians to explore the likelihood of MI being adopted and embedded within routine practice: • Gather respiratory clinicians' views about whether MI is worthwhile and could be used within routine clinical practice **(see section 6.4, page 148)**; • Identify perceived training requirements to enable clinicians to deliver MI competently **(see section 6.4.4.3, page 160 and section 9.4.3.1, page 271)**; • Identify what might prevent MI from being delivered within clinical practice **(see section 6.4.4, page 157 and section 9.4.3.2, page 279)**.	Studies 1 and 3
	Explore the feasibility of a package of MI training for clinicians involved in PR: • Describe study uptake by NHS Trusts and PR clinicians employed within those organisations **(see section 8.3.2.3, page 190)**; • Specify the proportion of participants who complete each element of training and the time taken **(see section 8.4.2.2, page 208)**; • Identify reasons for non-completion/withdrawal **(see section 8.4.2, page 203)**; • Describe the relationship between participant characteristics and progression through training **(see section 8.4.2.1, page 206)**; • Describe how MI skills develop through training **(see section 8.4.4, page 211)**; • Identify the extent to which the training package leads to basic competency in MI **(see section 8.4.5.1, page 221)**.	Study 2
	Interview study 2 participants to: • Explore participants' experiences of learning MI and implementing the skills in clinical practice (**see section 9.4.2, page 255)**.	Study 3

Element	Task	Timing
Evaluation	Describe the feasibility of the method used within study 2 to assess treatment integrity: • Describe the challenges in coding MI skills and adherence within PR consultations **(see section 8.5.7.2, page 232 and section 8.5.7.3, page 233)**.	Study 2
Implement-ation	Interview participants from study 2 to: • Identify the areas of training/support that were perceived to facilitate and/or hinder MI skill acquisition and adherence in practice (**see section 9.4.3.1, page 271**); • Describe personal, service and programme issues influencing integration/MI adherence in practice (**see section 9.4.1, page 250, section 9.4.2, page 255 and 9.4.3.2, page 279**).	Study 3

Note. MI = motivational interviewing; NHS = National Health Service; PR = pulmonary rehabilitation. Study 1 = clinician views; study 2 = learning MI; study 3 = trainee experiences. [a]The need to test methodological uncertainties such as the most appropriate research design for a full evaluation is acknowledged but is beyond the scope of this PhD. [b]MRC guidance indicates this should include addressing procedural uncertainties (e.g. recruitment and attrition rates) but this is beyond the scope of this PhD.

5.4 Mixed methods research design

The research described within this thesis employed a mixed methods research design. According to Creswell and Plano Clark (2018) "In mixed methods, the researcher collects and analyses both qualitative and quantitative data rigorously in response to research questions and hypotheses, integrates (or mixes or combines) the two forms of data and their results, organises these procedures into specific research designs that provide the logic and procedures for conducting the study, and frames these procedures within theory and philosophy." (p. 5)

5.4.1 Value and rationale for a mixed methods approach

The aim and associated research objectives described in section 1.3 (page 4) are best suited to a mixed methods research design primarily because one source of data is insufficient to address the research objectives fully. In general, the use of both quantitative and qualitative data harnesses the strengths of each whilst minimising their limitations, which leads to a more comprehensive understanding of the issues being investigated (Tashakkori and Teddlie 2010; Borglin 2015; Creswell and Plano Clark 2018). A mixed methods approach has been used by others in related fields. For example Moore and colleagues used a pragmatic, formative mixed methods evaluation of an initiative designed to embed MI into routine practice within the Welsh national exercise referral scheme (Moore et al. 2012). In the subsequent trial, qualitative and quantitative analysis were used to test the theory underpinning the initiative (Moore et al. 2013).

5.4.2 Multiphase mixed methods design

According to Creswell and Plano Clark (2018 p. 65) there are three core types of mixed methods study design: convergent, explanatory sequential and exploratory sequential.[27] In the convergent design, quantitative and qualitative data are collected and analysed separately and then compared and contrasted. The purpose is to gain a comprehensive insight into the issue or question being investigated and / or to see whether the two types of data support or contradict each other (Creswell and Plano Clark 2018). Exploratory sequential designs involve two discrete phases. Initially, qualitative data is collected and analysed, the results of which are used to inform the development of a subsequent quantitative phase. The quantitative element, therefore, builds on the qualitative phase that precedes it. The explanatory sequential design

[27] Cresswell and Plano Clark acknowledge that there is debate in the field as to the number of mixed methods designs that exist and variation in classification systems described by other methodologists.

also involves sequential data collection, but with the quantitative phase prefacing the qualitative phase. The intention is to use the qualitative element to explain or extend the quantitative findings (Creswell and Plano Clark 2018).

A multiphase mixed methods design combines core mixed methods projects and is used to gain comprehensive understanding of complex issues (Nastasi and Hitchcock 2016; Creswell and Plano Clark 2018). The research contained within this thesis used a multiphase mixed methods design to address the overarching research questions detailed in section 1.3 (page 4) and each of the tasks outlined in Table 5-1 (page 130). This involved two connected mixed methods projects (see Figure 5-2, page 136). The first project employed an exploratory sequential design. This was followed by a second project with an explanatory sequential design. These two projects are described in the next two sections.

5.4.2.1 Exploratory sequential mixed methods project

The exploratory sequential project began by exploring issues relating to the feasibility and acceptability of MI in respiratory contexts using qualitative data collection and analysis (study 1: clinician views). The intention was to gain an in-depth understanding of what clinicians perceived would be necessary to make MI part of routine care (anticipated training needs, facilitators and barriers to implementation and ideas to support the development of the MI intervention). The findings from the qualitative study were used to inform the development of a MI intervention and associated training package that was tested within a subsequent quantitative study involving a different group of PR clinicians (study 2: learning MI). The aim of prefacing the training study with a qualitative phase was to gain insights that would help to maximise MI skill acquisition and adherence in clinical practice through training (see Figure 5-2, page 136).

Analysis of both elements of the exploratory sequential project was undertaken separately. This was necessary as the second study built on the findings of the first. The results of the qualitative phase (study 1: clinician views) are reported in section 6.4 (page 148) and discussed in section 6.5 (page 161). The implications of the qualitative findings for the subsequent quantitative phase (study 2: learning MI) are described in section 6.5.3 (page 165).

5.4.2.2 Explanatory sequential mixed methods project

The second mixed methods project employed an explanatory sequential design. This commenced as the fourth cohort of participants from study 2 (learning MI) were being trained. It was prompted by observations made whilst training the first three cohorts of participants, specifically; the variable MI skill acquisition, difficulties integrating MI into practice and a greater

number of participants withdrawing than was expected. In this sense the design was 'emergent'; that is the second element (study 3: trainee experiences) was conceived as a result of issues arising during the conduct of the first (study 2: learning MI).

In this project, the quantitative findings from study 2 (learning MI) were used to plan the focus of the qualitative follow-up phase (study 3: trainee experiences). The aim of mixing methods was to use the qualitative element to help make sense of the quantitative findings that required further exploration and explanation. Study 3, therefore built on the findings of study 2 (see Figure 5-2, page 136).

Study 3 necessarily involved participants from study 2 since the goal was to explore their experience of the training and attempts to integrate MI into practice. It has been recommended that initial quantitative findings in explanatory sequential designs are used to purposively sample the participants who should be involved in the qualitative follow-up (Creswell and Plano Clark 2018). This was not feasible in the context of this research, a point that is explained within section 9.5.6 (page 297).

Quantitative and qualitative data sets are necessarily analysed separately in an explanatory sequential design enabling the quantitative results to be used to plan the focus of the qualitative follow-up (Creswell and Plano Clark 2018). The results for both quantitate and qualitative elements of this mixed methods phase are reported separately in the first instance. Then, as shown in Figure 5-2 (page 136), there is a separate section that features a discussion of how the qualitative findings help to explain the quantitative results of the training study (see study 3 discussion: section 9.5, page 286).

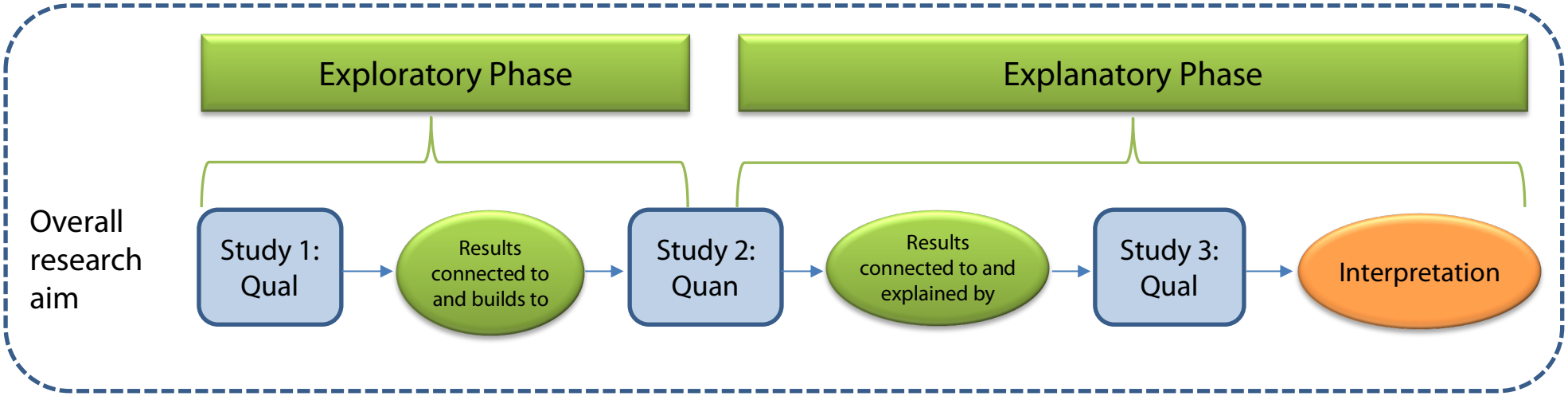


Figure 5-2. Multiphase mixed methods design depicting the order and relationship between each element of the programme of research.
Study 1 = clinician views; study 2 = learning MI; study 3 = trainee experiences.
Notation convention as described in "*Designing and conducting mixed methods research*" by JW Creswell and VL Plano Clark (2018) (3rd Edition). London: Sage. Qual = qualitative; Quan = quantitative. → : indicates sequential methods.

Table 5-2 *Summary of the Multiphase Mixed Methods Design Used*

Mixing issue	Exploratory sequential project	Explanatory sequential project
Timing of strands	Sequential: qualitative first	Sequential: quantitative first
Reason for mixing	Need to test/measure exploratory findings regarding clinicians' perceptions of the feasibility of MI training.	Need to explain quantitative findings following MI training.
Mixing strategy	Use qualitative results from study 1 (clinician views) to: i) determine the acceptability of MI; and ii) inform the model for integrating MI within PR and the associated training package (content, focus and schedule) used in study 2 (learning MI).	Use quantitative results of study 2 (learning MI) to make decisions about qualitative research questions and data collection used in study 3 (trainee experiences).
Interpretation	Results of study 1 (clinician views) are presented first, with a description of how the findings informed study 2 (learning MI). The results of study 2 are then reported separately. There is no comparison of the qualitative and quantitative data sets as they involve separate samples of participants.	Results of study 2 (learning MI) and study 3 are reported separately. This is followed by a discussion of how the qualitative findings from study 3 (trainee experiences) help to explain and provide additional insights into the quantitative findings from study 2 (learning MI).

Note. MI = motivational interviewing. Content of table informed by: *"Research design: Qualitative, quantitative and mixed methods approaches"* by JW Creswell (2014) (4th Edition). London: Sage; and *"Designing and conducting mixed methods research*" by JW Creswell and VL Plano Clark (2018) (3rd Edition). London: Sage.

5.4.3 **Validity**

Though there is debate as to the appropriateness of the term validity in mixed methods research, most notably because of its strong association with quantitative methods (Maxwell and Mittapalli 2010), it is generally accepted that mixed methods designs raise particular validity issues beyond those that are relevant to the qualitative and quantitative strands (O'Cathain 2010; Creswell and Plano Clark 2018). The threats to validity that are relevant to the two mixed methods projects reported within this thesis, together with the strategy employed to minimise them are summarised in Table 5-3 (page 138). Study specific validity issues are discussed within the relevant sections of the chapters in which individual studies are reported.

Table 5-3 *Threats to Validity Associated With Each Mixed Methods Project and Strategies Used to Minimise Them*

Type of design	Validity threats	Strategy used to minimise threat
Exploratory sequential design	Not building the quantitative feature based on the qualitative results.	Explicit statements made about how each major finding from study 1 (clinician views) informed the development of the training package/MI intervention in study 2 (learning MI).
	Selecting participants for the qualitative study that are the same individuals as the qualitative sample.	Participants recruited from several NHS organisations. To avoid duplication, different clinicians were used for studies 1 (clinician views) and 2 (learning MI).[a]
Explanatory sequential design	Failing to identify important qualitative results to explain.	Quantitative analysis of study 2 (learning MI) results completed prior to planning the qualitative follow-up (study 3: trainee experiences). All possibilities relating to variability in skill acquisition, progression through training, clinician demographics and programme design factors were considered.
	Not explaining surprising contradictory quantitative results with qualitative data.	Semi-structured guide for qualitative interviews based on careful consideration of study 2 (learning MI) findings and involved probing the surprising and contradictory outcomes.
	Not connecting the initial quantitative results with the qualitative follow-up.	The sample was diverse and comprised a mix of participants who could provide explanations for each of the quantitative findings of interest.[b] The results of studies 2 and 3 are linked in the discussion section within chapter 9 and form the basis of the thesis summary and conclusions (chapter 10).

Note. MI = motivational interviewing; NHS = National Health Service.
Adapted from *"Designing and conducting mixed methods research"* by JW Creswell and VL Plano Clark (2018) (3rd Edition). London: Sage (p.252).
[a]One participant (a nurse) who acted as a local collaborator within a participating NHS organisation participated in both study 1 (clinician views) and 2 (learning MI) though she was forced to withdraw prior to submitting any follow-up data from the second study. None of the participants were involved in all three studies. [b]Best practice would normally involve using the quantitative results to inform which participants to sample for the qualitative element. This was not feasible in the context of this project (see Section 9.5.6, page 297).

5.4.4 **Philosophical worldview**

A philosophical worldview refers to the set of beliefs and assumptions that guide the research endeavour (Lincoln et al. 2013; Creswell and Plano Clark 2018). Four worldviews are commonly referred to in the literature: postpositivist, constructivist, transformative and pragmatic (Creswell and Plano Clark 2018), each of which differ on the basis of epistemology (beliefs about the theory of knowledge and how it is constructed), ontology (beliefs about the nature of reality) and axiology (beliefs about the role of ethics and values whilst conducting research) (Tashakkori and Teddlie 2010).

The research contained within this thesis was underpinned by a pragmatic worldview. Pragmatism is the worldview that is most commonly associated with mixed methods research (Biesta 2010; Borglin 2015; Creswell and Plano Clark 2018). At its heart is a focus on the research problem and the use multiple methods of data collection to derive comprehensive knowledge and understanding about the problem (Tashakkori and Teddlie 2010; Creswell and Plano Clark 2018).

The transformative worldview described by Mertens (2007) has also been used in mixed methods research, though it places "central importance on the lives and experiences of marginalised groups such as women, ethnic/racial minorities, members of the gay and lesbian communities, people with disabilities and those who are poor. The researcher who works within this paradigm consciously analyses asymmetric power relationships, seeks ways to link the results of social inquiry to action and links the results of the inquiry to wider questions of social inequity and social justice." (p. 139 – 140). This focus, therefore, means that it is not suited to the research contained within this thesis.

Within the pragmatic worldview, priority is given to addressing the research question or objectives and this is considered to be more important than the method employed or the specific philosophical position that underlies it (Morgan 2007; Tashakkori and Teddlie 2010; Creswell 2014). As Creswell and Plano Clark (2018) have noted "[pragmatic research] is pluralistic and oriented toward 'what works' and real-world practice" (p. 37).

In terms of an underpinning philosophy, pragmatism considers both singular and multiple realities (ontology). It involves testing hypotheses and exploring cause and effect (as in post-positivism), but also holds that multiple perspectives relating to people's attitudes, beliefs, intentions, meanings and experiences are valid (as in constructivism) and important in the service of gaining a complete answer to the research question (Biesta 2010; Creswell and Plano Clark 2018). In the context of the thesis research, study 1 (clinician views) and study 3 (trainee experiences) embraced the multiple perspectives of participants within the samples. In both

studies it was considered important and relevant to acknowledge context. That is to acknowledge that each participant has their own reality that is considered correct, which may be influenced by such things as the organisation that employs them, their profession, seniority and level of experience.

The relationship between the researcher and the focus of the research (epistemology) in pragmatic research varies as a function of the issue being investigated, with value ascribed to both objective and subjective knowledge. It involves research that is underpinned by a postpositivist epistemology in which the researcher maintains objectivity and impartiality, collecting and analysing data using validated instruments, whilst taking measures to minimise bias. It also employs methods that are underpinned by constructivist principles in which data collection and analysis is driven by the idea that knowledge is socially constructed by both the researcher and participants and is influenced by the researcher's own values (Guba and Lincoln 2005; Lincoln et al. 2013).

The ontological positions assumed for each of the three studies gave rise to the epistemological stance. The qualitative research designs employed for study 1 (clinician views) and study 3 (trainee experiences) sought to develop understanding of how clinicians experience MI and MI training in the context of the work that they do. This involved a level of interpretation of what participants said in the service of trying to understand what reality meant to them with an orientation toward constructivist principles. By contrast study 2 (learning MI) aligned with post-positivism, employing experimental research design principles to minimise bias and maximise objectivity.

Pragmatic research also adopts different standpoints with regard to the role of values (axiology). Quantitative strands of mixed methods research will work towards unbiased understanding, for example by employing measures to reduce the risk of bias. More biased perspectives may be embraced within qualitative strands however, where the researcher allows and is transparent with regard to how their biases and interpretations have influenced the research (Creswell and Plano Clark 2018). The success of attempts to minimise bias in study 2 (learning MI) is considered in the strengths and limitations section of the discussion (section 8.5.7, page 231). The author of the thesis has also considered how his background and interests shaped data collection and interpretation within the two qualitative studies. The insights are included in the discussion sections of the relevant chapters and within the audit trails that can be found for study 1 (Appendix H, page 369) and study 3 (Appendix P, page 441).

5.5 Conclusion

In this chapter there has been a description and justification for the methodology employed to address the research questions defined in section 1.3 (page 4). It was argued that the use of MI as an adjunct to PR constitutes a complex intervention. In line with MRC guidance, prior to a definitive trial of effectiveness, questions relating to intervention design and feasibility need to be answered. The research contained within this thesis drew on a multiphase mixed methods design to address the research questions. Two inter-related projects were described (an exploratory sequential project and an explanatory sequential project). The research was guided by a pragmatic worldview which places central importance on the research questions being investigated and draws on multiple methods of data collection to derive comprehensive knowledge and understanding to address them.

In the next chapter, the first study in this programme of research is presented. Study 1 employed a qualitative design with semi-structured interviews to gather respiratory clinicians' views of MI following a one-day 'Introduction to MI' workshop.

Chapter 6: Study 1 Respiratory clinicians' views of motivational interviewing

6.1 Introduction

The first study presented in this thesis was conducted to gather respiratory clinicians' views about the use of motivational interviewing (MI) to motivate patients to change health related behaviour. The study forms the first part of the exploratory sequential mixed methods project described in section 5.4.2.1 (page 134). An abridged version of this chapter has been published in a peer review journal and can be found in Appendix Q.1 (page 464).

6.2 Research aim and questions

The study aimed to assess the feasibility and acceptability of MI for use within respiratory contexts. Specifically, the research questions were:

1) To what extent do clinicians working in a respiratory context believe that MI is worthwhile and could be integrated within their routine practice?
2) Do respiratory clinicians believe that they can deliver MI competently?
3) What training requirements do respiratory clinicians foresee are required to enable them to deliver MI competently?
4) What might prevent MI being delivered within clinical practice?

6.3 Method

6.3.1 Design

A qualitative design involving semi-structured interviews and thematic analysis was used to answer the research questions. The focus was on respiratory clinicians' attitudes, beliefs and feelings regarding MI, and therefore a qualitative design was appropriate. A semi-structured interview approach was selected because this gave an appropriate balance between providing the structure and focus of the pre-determined interview schedule, with the flexibility of open-ended questions and use of follow-up questions and prompts. As the aim of the study was to understand the individual experience of the participants, this was considered more appropriate than a focus group approach, which could have led to issues with sharing views in front of other participants. The logistics of arranging a group meeting for busy clinicians was also a concern.

Thematic analysis was selected, because it is a flexible approach with theoretical freedom, that can provide "a rich and detailed, yet complex, account of data" (Braun and Clarke 2006 p.78).

6.3.2 Participants and recruitment

Respiratory clinicians working within a community hospital in the south of England were invited by one of the clinical leads from within the service to attend for a one-day 'Introduction to MI' workshop. Potential attendees were informed that the training was part of a research study and that afterwards they would be invited to participate in a research study that would involve their attending a one-to-one interview lasting no more than 45-minutes to gather their views about the use of MI within the respiratory setting.

Study recruitment packs each containing an information sheet and a consent form were distributed following the workshop (see Appendix E, page 349). Those interested in participating were asked to contact a member of the research team to arrange a suitable time to obtain consent and undertake the interview. This resulted in a convenience sample of nine female respiratory clinicians (four physiotherapists, three nurses, one occupational therapist and one rehabilitation assistant) who worked in a respiratory service (in-patient and out-patient).

Whilst the focus of the overall programme of research was the feasibility of MI as an adjunct to pulmonary rehabilitation (PR), a decision was made to involve any respiratory clinician, rather than limit participation only to those who deliver PR. This decision was made on pragmatic grounds, since at the time of the research, only three clinicians within the participating site were directly involved in the delivery of PR. Therefore, to make a group workshop viable, and to satisfy the requirements of the host organisation, respiratory clinicians working within the in-patient department were also included. These clinicians frequently assist in the recruitment process for PR by talking with patients about the benefits of the programme during their stay in hospital. Therefore, their views about the potential of MI in this context were deemed to be particularly relevant and further justified their involvement.

6.3.3 Procedure

6.3.3.1 Ethics and research and development approvals

Prior approvals for the study were obtained from the National Health Service Integrated Research Application System (REC Reference Number: 06/Q1704/33) and the appropriate Research and Development department.

6.3.3.2 'Introduction to motivational interviewing' workshop

The workshop that prefaced the interviews was facilitated by the author and comprised a blend of didactic input, modelling of the MI approach using both video material and facilitator led demonstrations, as well as skills building exercises and opportunities for discussion. The workshop was facilitated in a style that is consistent with the spirit of MI, thus providing a safe and supportive environment for attendees to consider alternative ways of working with patients and experiment with new skills. Further details of the workshop can be found in Appendix F (page 363).

6.3.3.3 Data collection

Since the author delivered the workshop, it was felt that participants' responses might have been subject to social desirability bias had he also interviewed them. Therefore, in the service of gathering participants' true views about the workshop and the utility of MI in their practice, one of the author's supervisors, a Health Psychologist, Associate Professor and experienced qualitative researcher conducted the semi-structured interviews (MD-H). Although the supervisor observed the workshop to increase her understanding of MI, she did not participate in it and was otherwise independent.

Interviews were carried out in a private consulting room within the hospital setting at least 2-weeks after the workshop. Therefore, participants would have had the opportunity to reflect on what was covered in relation to their practice. A schedule was used to guide each interview (see Appendix G, page 367) and questions were asked in a non-leading, depersonalised manner to minimise the risk of influencing participants' responses. Data analysis occurred after data collection was complete.

6.3.4 Data analysis

6.3.4.1 Process

Thematic analysis is a method for identifying, analysing and reporting important patterns (themes) within data. It aims to systematically organise and describe a data set in rich detail (Braun and Clarke 2006). The systematic approach to thematic analysis described by Braun and Clarke (2006) and recommended by others as best practice (Howitt 2013) was adopted for use in the present study. It is summarised in Table 6-1 (page 146). The phases are not mutually exclusive and are recursive, meaning that it necessary to frequently return to earlier stages to ensure consistency between the themes and data.

Table 6-1 *Phases of Thematic Analysis Used in Study 1*

Phase	Description of process
1. Data familiarisation	Audio-recordings of interviews were transcribed verbatim (RS). Transcripts were read and re-read (RS). Initial ideas were noted (RS).
2. Generating initial codes	Systematic coding of entire data set on a line-by-line basis (codes were assigned to chunks of data - words, sentences or paragraphs) (RS). Extracts of data relevant to each code were collated (RS). Written reflection on interesting features was produced (RS).
3. Searching for themes	Excerpts from each code were re-read (RS). Codes were collated into potential themes (RS).
4. Reviewing themes	Research team members checked whether the themes worked in relation to the coded extracts (RS, MD-H). All transcripts were re-read to establish whether themes work in relation to the data set (RS).
5. Defining and describing themes	On-going analysis was performed to refine the specifics of each theme and the overall narrative of the analysis (RS, MD-H). Research team members checked that each theme captured something important in relation to the overall research question.
6. Producing the report	Appropriate examples of extracts that best represent each theme/sub-theme were selected (RS, MD-H). The analysis was linked to the research question and literature (RS). A final written report was produced (RS).

Note. RS = Robert Shannon (author of thesis); MD-H = Maggie Donovan Hall (PhD supervisor). Adapted from "Using thematic analysis in psychology" by V Braun and V Clarke (2006) *Qualitative Research in Psychology* 3(2): 77-101.

6.3.4.2 Analytical focus

Analysis was not theory driven but codes for the emergent themes were developed inductively from the interview transcripts. In this sense, they were closely linked to the participant narratives and the author made a conscious effort to prevent his preconceived ideas and knowledge of MI from constraining the analysis. On-going reflexive dialogue with one of the author's supervisors (MD-H) throughout the analytic process served to maximise the correspondence between participants' description and the author's representation of them.

Themes were identified primarily from the explicit content of participant interviews, though it was necessary to examine latent themes regarding participants' perception of MI in relation to

their normal clinical practice. Therefore, a theme relating to participants' perception of professional identity drew on ideas and conceptualisations that were thought to underpin their views about the potential of MI in their work. Patterns in the narratives are discussed in relation to previous literature.

6.3.4.3 Trustworthiness

Guba (1981) first introduced the term trustworthiness to conceptualise rigour in qualitative research. He described four dimensions of trustworthiness, which are shown in Figure 6-1.

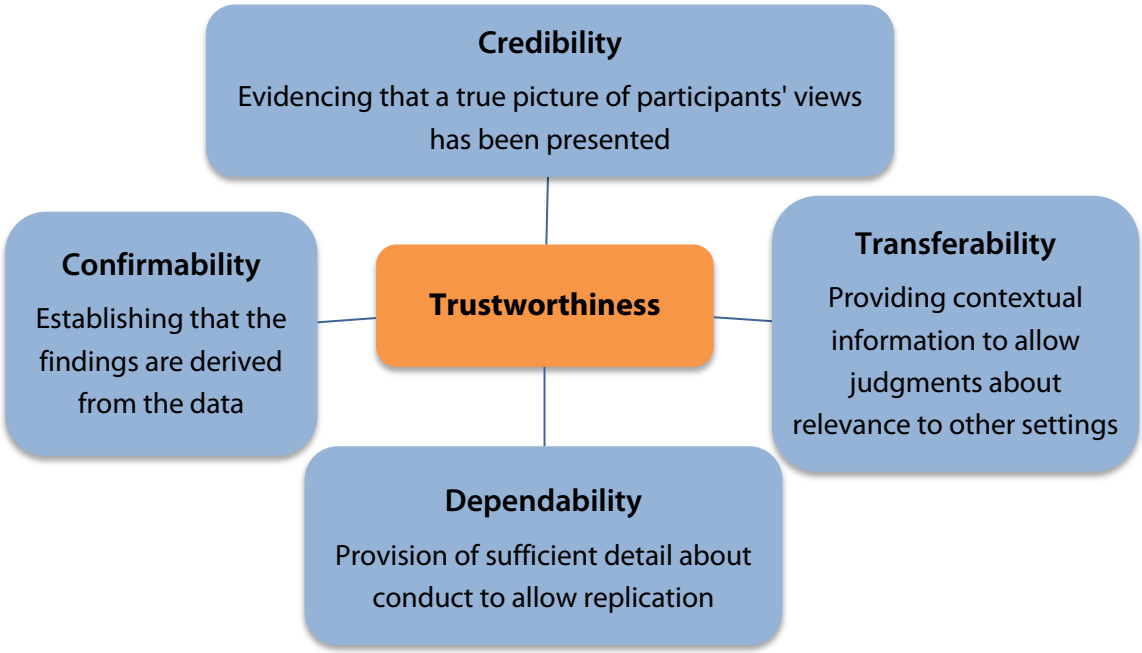


Figure 6-1. Dimensions of trustworthiness in qualitative research.
Adapted from "Criteria for assessing the trustworthiness of naturalistic inquiries" by EG Guba (1981). *Educational Communication and Technology Journal* 29(2): 75-91.

The strategies employed within the present study to demonstrate trustworthiness are described below. These have been informed by several sources (Glaser and Strauss 1967; Guba 1981; Braun and Clarke 2006; Carter and Little 2007; McBrien 2008; Howitt 2013; Yardley 2015). The dimension(s) of trustworthiness that each is designed to justify is provided in parentheses.

1. Provision of contextual information, such as the professional background of the sample, to enable others to make judgements about the relevance of the research to different environments or situations (transferability).
2. Prolonged engagement with the interview transcripts throughout the analytic process (*credibility*).

3. Provision of an audit trail (see Appendix H, page 369) detailing the procedures involved in data collection and analysis and the step-by-step decisions that were made. This enables an observer to understand and follow the author's activities and interpretations. Reflexivity was fundamental to the audit trail. This involved critical accounts of the author's decision making and acknowledgment of the impact of any biases on the judgments that were made (*confirmability, credibility, dependability*).

4. On-going reflexive dialogue with the author's supervisor (otherwise known as peer debriefing) helped to ensure adherence to analytical method and safeguard against biases in interpretation of the interview data (*confirmability, credibility*).

5. Constant comparison (Glaser and Strauss 1967) was used as a systematic means of developing and refining the content of categories during coding and theme generation. During coding (phase 2) for example, constant comparison involved checking the internal homogeneity of chunks within each code (to establish that similarly coded chunks resemble each other) and external heterogeneity (that is minimal overlap in content across codes). Codes were collapsed in instances where different codes had been used to describe similar content and split when a code encompassed elements with different meaning (*credibility, confirmability*).

6.3.4.4 Aspects of presentation

In accordance with guidance from the American Psychological Association (2010), the following edits were used within participant quotations as part of the results section:

(. . .) means part of verbatim material within a sentence that was not immediately relevant to the point being made was omitted.

(. . . .) indicates omission of verbatim material between two or more sentences.

[word] square brackets around author's word(s) to replace a name to protect anonymity, or to add word(s) where meaning would have otherwise been ambiguous.

6.4 Results

Four main themes were identified. The final thematic map indicating the main themes and associated sub-themes is shown in Figure 6-2.

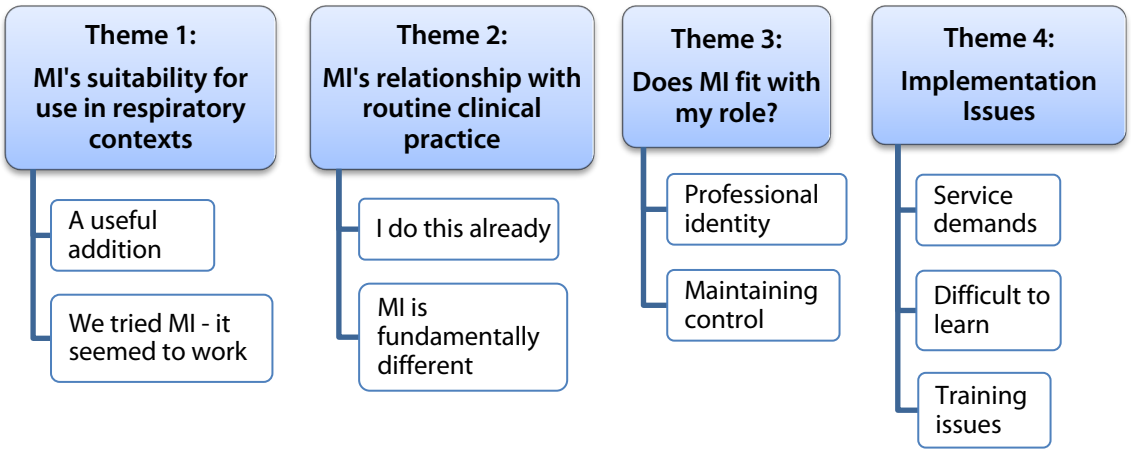


Figure 6-2. Study 1 themes and associated sub-themes: Respiratory clinicians' views of motivational interviewing (MI).

6.4.1 Theme 1: Motivational interviewing's suitability for use in respiratory contexts

6.4.1.1 A useful addition

Most participants talked favourably about the use of MI within the respiratory setting. They believed that MI improved the relationship that they had with patients and had the potential to be an effective method to motivate patients to change behaviour.

> *I could see and every example they gave just made so much sense. It's um, it is something that I would like to pursue.*
>
> *(Participant 3, Physiotherapist; lines 146-148)*

The potential of MI to promote engagement and commitment to PR was also discussed. Sometimes patients agree to attend for the programme but are at a high risk of withdrawal because at the time of committing to it, they do not appreciate the intensity of exercise that is involved or the requirement for additional exercise in between supervised sessions. One participant referred to this challenge:

> *. . . but it's so hard . . . they present themselves for a pre-assessment session and they all come in and their whole body language is of aghh, what am I signing up for here?*
>
> *(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 137-141)*

Another participant described how some patients are reticent about making changes in their physical activity because of a fear of breathlessness. The style of MI was perceived to be helpful in these circumstances:

Um the other thing is exercise for our pulmonary rehab. Trying to encourage people that are breathless to exercise is really difficult because they are so scared of their breathlessness anyway.

(Participant 4, Rehabilitation Nurse; lines 68-70)

Depression was also considered to undermine the progress that patients make in rehabilitation. Participants accounts indicated that MI may be particularly helpful for working with patients who are low in mood:

But I definitely think it's useful to consider in our practice because for, when you come across that sort of patient that is maybe depressed and you're not getting anywhere with them, and so I'd sort of test to see how the patient responds initially and if they're not responding very well then maybe go along that line [of using MI].

(Participant 9, Physiotherapist; lines 177-181)

MI was also seen as a useful way to pre-empt patient hostility. This was deemed particularly relevant where patients had previously encountered a paternalistic consulting style:

. . . they come in quite defensive automatically because they have been to several GPs and practice nurses who have potentially taken on like an authoritative role … so they come in automatically thinking that is what we are going say really, really defensive. So . . . employing say a motivational interviewing technique, I am hoping that they will realise that we are a bit more approachable.

(Participant 4, Rehabilitation Nurse; lines 163- 169)

6.4.1.2 We tried motivational interviewing and it seems to work

Following the workshop, without prompting, several participants tried some of the skills they learnt about in their practice. One of the physiotherapists noticed greater responsiveness from patients whilst using MI as compared with her normal way of working:

. . . you see quite a different reaction from the patient, they seem to have a lot more belief in what you are trying to encourage them to do.

(Participant 8, Physiotherapist; lines 28-29)

Another participant, an Occupational Therapist described beneficial effects of MI which reinforced her belief in its effectiveness:

. . . I worked with a particular patient in a different way and had a very good outcome, um which I was really - it was really positive and also another person on the course . . . we worked together with this patient in the same way, um and you could see it did work.

(Participant 5, Occupational Therapist; lines 57-61)

The positive outcome was attributed, largely to improved listening. Participants remarked that reflective listening helped clarify their understanding of the patient, which in turn, helped to improve the quality of the relationship that they felt they had:

Not that I didn't listen before but I think actually taken on board maybe more what they are saying and showing that I understand, whereas before you might listened to a patient and then you say right okay that's good let's - now because I'm paraphrasing what they're saying to me, it shows them that I have actually listened to what they've said and I think you get a much better rapport that way with patients and they're more willing to do what you want them to do.

(Participant 8, Physiotherapist; lines 91-97)

Perhaps the strongest endorsement for the use of MI in a respiratory setting came from a nurse who valued it so much that she was concerned that she might relapse back to old ways of working. Here she refers to her righting reflex – the natural helping inclination to provide advice at the expense of evoking the patient's ideas, which has the potential to trigger defensiveness and undermine engagement:

I just hope I continue to use and that my own reflex, righting reflex, and my own previous assessment techniques don't just slip back in as a bad habit, you know, I am worried that I will get one tired week or one bad week and start going back to how I was before.

(Participant 4, Rehabilitation Nurse; lines 297-300)

6.4.2 **Theme 2: Motivational interviewing's relationship with routine clinical practice**

The workshop that prefaced the interviews represented participants' first exposure to MI. Participants varied in the extent to which they 'recognised' MI as being consistent with their routine practice.

6.4.2.1 I do this already

Some participants believed that they were already using elements of the approach prior to the workshop:

But I think I do I do have aspects of motivational interviewing in me anyway when I talk, when I listen.

(Participant 9, Physiotherapist; lines 39-41)

One participant felt that her previous training in counselling, combined with her clinical experience meant that she had developed her own way of consulting with patients about behaviour change. When questioned on whether the workshop had prompted any changes in her practice she said:

I'm going to have to be very frank here and say not an exceptional amount, because I've been dealing with them for a long time. I did a counselling course some years ago and that taught me quite a lot.

(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 59-61)

Some components of MI seemed familiar to her, but she expressed uncertainty as to whether her practice was entirely consistent with MI. During her interview, she described how she tries to create a non-threatening environment to encourage patient involvement during the education element of PR. When it was suggested that she might be already using something that resembles MI she said:

Subtly, yes. Not knocking, and that's why I think I need to watch somebody else to see well actually I do do that, but I don't think that's what I am doing.

(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 169-170)

Another participant expressed a more definitive view about what she was doing. She described the workshop as having consolidated many of the skills that she had developed intuitively:

Yeah I did feel that I was doing most of it anyway. But for somebody to tell me that this is what we do, and this is why we are doing it. And I thought oh, actually that makes perfect sense yeah.

(Participant 1, Rehabilitation Nurse; lines 200-202)

When explaining which elements of MI they were using in their practice though, most described a general patient-centred orientation rather than anything that is unique to MI. This suggests that the workshop had not been successful in helping the participants make sense of all the elements that make MI different:

Well I always go on the patient's past history and what they prefer and how they would like to be cared prior to coming into hospital. I always try and research that from the carer and

the patient as to what their habits were, when did they try different things before, um to try and change their behaviour.

(Participant 7, Nurse; lines 40-43)

The participant who had expressed uncertainty as to whether she was using MI, described the open nature of her consulting style:

Yeah, probably not in the way it was completely phrased or [workshop facilitator] *put it across but yes, I think, and it's personal that I ask too many closed questions and not open questions but I do allow the patient to talk quite openly and freely.*

(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 65-67)

Whilst the above descriptions are compatible with MI, they do not reflect the refined use of the skills or the underpinning strategy that distinguishes MI from everyday patient-centred conversations. The workshop involved in this study was designed to introduce the critical elements and theoretical underpinnings of MI, and importantly help participants to appreciate how it differs from traditional practice. Another goal was to avoid alienating participants by providing so much detail that they left the workshop confused and/or believing they would not be able to master the skills involved. The feedback suggests an oversimplified picture was presented that resulted in some participants believing they were already using MI.

6.4.2.2 Motivational interviewing is fundamentally different

Many participants did recognise differences between what was taught in the workshop and what they normally deliver in practice. One lamented her reliance on advice giving:

Um, I'd still listen, but I don't think I'd probably, I'd probably more bombard them with advice and say look it's important you do this because of this.

(Participant 9, Physiotherapist; lines 17-18)

Others spoke about the need to think about the specific language that they use and the benefit of evoking the patient's perception of their problem:

I remember thinking at the time I am definitely going to do that. I can see there's a genuine benefit of just, you know letting the patient tell you what the problem is.

(Participant 1, Rehabilitation Nurse; lines 194-195)

For the majority, the philosophy and practice of MI was perceived as antithetical to their normal way of encouraging behaviour change. It calls for a redirection of their expertise from one in

which the aim is to install motivation through the provision of expert advice, to one that relies on empathic counselling skills to carefully evoke and reinforce the patient's own reason for change:

> *I thought before that when they had been to their GP, the GP's probably waved a finger and said you most give up smoking it is bad and so when they come into me because I try and be friendly and nice about I feel that I was doing a better job, but I was actually doing the same thing just in a different tone of voice.*
>
> *(Participant 4, Rehabilitation Nurse; lines 281-285)*

Practicing MI therefore, often necessitates the suppression of tacit, over-learned counselling habits that run counter to its collaborative, evocative and autonomy respecting style. This need is reflected in the following quote:

> *I think the main thing was we kind of all discovered as healthcare professionals that our righting reflex was really strong and when we were trying to do the role plays we were automatically trying to correct what people were saying.*
>
> *(Participant 4, Rehabilitation Nurse; lines 12-16)*

Although participants had previously experienced some success with advice giving to encourage behaviour change, with sufficient success to reinforce its use, they also thought its effectiveness was limited. Furthermore, they voiced concerns regarding its potential for undermining rapport and increasing patient defensiveness:

> *Don't just force your, not your opinions, but the health information on someone because sometimes they've heard it so many times before like the smokers and things and it's trying to work out why it hasn't worked rather than just bombarding them with it because it's not going to have any effect, they'll just deflect it like they have with any other professional.*
>
> *(Participant 9, Physiotherapist; lines 185-189)*

Most participants indicated that they reflected on their normal consulting style as a result of the introductory workshop. One evaluated it quite negatively:

> *I am just information giving yeah continuously, it makes me sound like a bully, I don't think it is bullying at the time.*
>
> *(Participant 4, Rehabilitation Nurse; lines 103-104)*

Although an awareness of the difference between the style and focus of MI and routine practice maybe a precondition for learning the method, this quote suggests that being introduced to MI and trying out the skills with patients can be somewhat destabilising.

6.4.3 Theme 3: Does motivational interviewing fit with my role?

6.4.3.1 Professional identity

A third theme, based predominantly on one physiotherapy participant's views, relates to professional identity and how this might influence the adoption of MI in practice. This participant described how consultations in respiratory settings frequently involve several tasks that relate to both physical and psychosocial aspects of care:

> *. . . but we have to pack quite a lot into the physical aspects of the consultations as well as psychosocial aspects.*
>
> *(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 74-76)*

Although she thought it important to address psychosocial issues such as behaviour change, she perceived that activities that relate to the physical aspects of the patient's problem are prioritised in practice. For physiotherapists this includes subjective assessments of the problem (history taking and questions relating to signs and symptoms the patient is experiencing) assessments of respiratory function (for example spirometry and tests of aerobic capacity) as well as physical interventions.

> *Um, but it's a question of what is the raison d'etre for the service, you know what is the reason we're here for? And it's really quite physical, this is a lovely bolt on to it.*
>
> *(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 114-116)*

The focus on physical matters means that patients' psychosocial needs are sometimes overlooked:

> *. . . you know that's the bit that gets left off the end.*
>
> *(Participant 2, Respiratory Clinical Physiotherapy Specialist; line 76)*

The high status that is afforded to physical issues is determined largely by service demands and structures. However, clinicians' professional identity and relative comfort working within a biopsychosocial framework also influence the extent to which psychosocial issues are addressed.

A reluctance to address psychosocial factors is evident in another physiotherapy participant's account of her normal practice in which she described an action-orientated approach to care. She explained how spending therapy time talking with patients is somewhat unorthodox and does not sit entirely comfortably with her professional identity, despite being helpful for patients:

> *No for me I'd just go in, do the treatment and get out. That's the way I've been taught. And so it was quite, you know I feel like if I just go in and chat to someone, it's not, I mean they still have had therapy if you're giving them advice, but it's not - I need to get up, and we need to get them to do something. And so it was quite different going in having a chat, but I think for the right patient it works, that's what she needed.*
>
> *(Participant 9, Physiotherapist; lines 123-128)*

Professional training was seen as being formative in developing a focus on physical parameters at the expense of the therapeutic relationship and psychosocial issues:

> *They should be* equal [physical and psychosocial issues] - *that's the problem that we, you know, maybe being physiotherapists, you always see it as the physical because that's the way that you are naturally trained.*
>
> *(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 128-130)*

This participant also reasoned that physical issues are prioritised because they are the most straightforward to address. She believed that less experienced clinicians shy away from psychosocial related discussions because of the potential for raising sensitive issues:

> *And some people you haven't seen these people for 20 years some people who aren't so experienced tend to stick to the physical because that's the nice parameters that are easiest to monitor rather than delve into, you know asking patients quite sensitive questions or touching on raw nerves people don't always like do they?*
>
> *(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 76-80)*

6.4.3.2 Maintaining control

The importance of maintaining control was evident in participant accounts. One argued that a clinician's focus during a consultation influences the specific communication skills that they use; closed questions are preferred to open questions because their focus can be helpful in maintaining control:

As physios we may be used to expecting an answer and almost give a prompt to the patient in your questioning, we give a prompt rather than allow them freely to give the information over to you. Pretty well the clearest things [from the workshop training] *were how you question patients and how you phrase rather than standard closed questioning that physios I think preferentially tend to use. You know we've got black and white answers to the questions we're asking.*

(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 5-10)

Psychosocial matters were perceived to be relatively ambiguous and take time to address. Therefore, using closed questions to restrict the conversation to physical matters was seen to serve a practical function in preventing consultations from running over time. This participant also believed physiotherapists need to feel confident in handling psychosocial issues before they allow conversations to stray into that territory:

So, it may be just phrased in a different way rather than having the confidence to let it be a more open discussion.

(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 103-105)

According to this participant, the extent to which MI is used as part of routine care will be influenced by service demands, each clinician's perception of their role, their inclinations and confidence in handling psychosocial matters. Throughout her interview, she emphasised the importance of addressing patients' psychosocial needs, though she suggested employing psychologists within a service as the best way to achieve this. That she would make this recommendation, rather than encourage clinicians to broaden their traditional physical focus, is perhaps testament to how uncomfortable and challenging she perceives integrating methods such as MI into practice might be:

I would say my ideal would be to have access to clinical psychology or psychology, it doesn't have to be full psychotherapy, I don't mean psychotherapy I think it's clinical, you know psychology support.

(Participant 2, Respiratory Clinical Physiotherapy Specialist; lines 134-136)

6.4.4 **Theme 4: Implementation issues**

6.4.4.1 Service demands

In general, participants in this sample viewed MI positively. However, they also highlighted several issues that would likely influence its integration within routine clinical practice. The pace

of modern healthcare is fast with many pressures that compete for clinicians' time; a lack of time was felt to be a significant factor that might present a barrier to its use:

> *. . . because of time constraints we don't get a huge amount of time to spend with our patients unfortunately.*
>
> *(Participant 8, Physiotherapist; lines 8-9)*

On the other hand, there was a sense that some additional investment in time (particularly listening) might actually lead to greater levels of overall efficiency in the care that is provided:

> *. . . you don't have loads of time with patients um and I find that you just tend to go in, give them all the information or whatever and then get out, rather than spending a more time sometimes spending more time with them initially – just an extra 10 minutes means you don't need to spend so much time with them later on.*
>
> *(Participant 9, Physiotherapist; lines 51-55)*

When participants reflected on what is important from the patient's perspective, taking time to listen and to respond to their needs and priorities was seen to be a worthwhile investment:

> *. . . the nurses are rushing them to do this, the physios are rushing to do something, and everybody is at them and then suddenly there is somebody who is actually got a little bit of time for them and it seems to make a huge difference 'oh you give me so much confidence' and that's really nice for me to hear.*
>
> *(Participant 6, Rehabilitation Assistant; lines 159-162)*

Clinician participants were keen to impress that they have several different tasks to undertake as part of their role, each of which may demand different styles of communication. Whilst MI was perceived useful for addressing behaviour change issues, a key to its integration would be the need to switch flexibly between different communication styles based on the situation. One participant discussed this in the context of an initial consultation prior to PR, involving a combination of instruction, assessment and discussion about helpful behaviour change:

> *. . . there is definitely a place for motivation interviewing to discuss certain areas, say about their smoking or about their exercise, but then the other half of the interview we do need to give advice about their medication and when is best to take it and um what other factors to avoid to make their chest worse. So we have to be kind of clever in the way. I think that we need to incorporate both of those techniques.*
>
> *(Participant 4, Rehabilitation Nurse; lines 109-113)*

Two important considerations expressed were the timing of MI interactions and the need for a quiet space. This was relevant, particularly in busy wards where the clinicians felt conscious that the content of what might be discussed would necessitate additional privacy not afforded by the setting:

> *The pressures of the staffing levels and um the general sort of ambiance on the ward - you can often perhaps want to spend some time in quiet with a patient and you have to make a real effort to find both of those - the time and the quiet to do it.*
>
> *(Participant 3, Physiotherapist; lines 72-75)*

6.4.4.2 Difficult to learn

Beyond the environment within which these clinicians operate, the challenge of learning MI was also perceived to influence the likelihood that it would be adopted in routine clinical practice. Whilst participants had experienced some success with their initial efforts to use MI, they acknowledged that it would take time and practise to develop competence.

On first exposure, some perceived MI as being rather simple. The insights provided by the workshop combined with their attempts to implement it though were enough to convince most participants of its complexity:

> *. . . it is quite a difficult technique; it is more difficult than I thought it would be.*
>
> *(Participant 4, Rehabilitation Nurse; line 186)*

One challenge was the use of empathic listening and in particular, mastering complex reflections that capture the underlying meaning of what a patient has said. This is a more advanced skill used in MI that these participants were unused to:

> *. . . it was just that actually trying, rather than just repeat what the other person is saying, actually trying either paraphrase or emotionally reflect what they are saying, I found really difficult and I think is one of those skills that you really need to practice to improve on really.*
>
> *(Participant 8, Physiotherapist; lines 23-27)*

A view expressed by most of the group was that it takes time to learn MI and much practice to refine the skills:

> *. . . the more we practised, the more it seemed to make sense. Although I think it is one of those things which you need to practise lots in order to improve because I did find it*

difficult to start with. So one minute you think you've got it . . . . and you're suddenly stumped again and you're 'right how am I responding to this'?

(Participant 8, Physiotherapist; lines 143-149)

6.4.4.3 Training issues

The initial workshop was well received, and several participants emphasised the value of a safe and supportive learning environment:

. . . nothing was negative it at all, even if you said something and you thought 'I've been a right twit here' and he turned it around that it was a positive thing which I liked that in rather than dismissing 'that's wrong or no'.

(Participant 6, Rehabilitation Assistant; lines 129-132)

Different views were expressed regarding the role-plays that were used during the workshop. One felt they were somewhat contrived because the 'patient' response was not authentic:

. . . I think it was not a true-life event, it wasn't like being in practice, so a lot of it I wasn't fully motivated to do myself because it was with other colleagues rather than patients and it was different feedback than I would normally get from a patient so the feedback, it was difficult both ways really.

(Participant 7, Nurse; lines 17-21)

By contrast, another found them helpful, particularly because they afforded opportunities for the workshop facilitator to provide guidance:

Um, as much as I hate doing them, the role plays were actually really, really helpful. I hate doing them just because it is so, you feel really cringey if you say the wrong thing as the whole room is going to hear . . . it was nice to hear what Rob was saying to the others as well giving us guidance about what we probably should be saying and how to tailor what we were saying.

(Participant 4, Rehabilitation Nurse; lines 192-198)

The participants had attended a one-day training in MI, and the consensus was that whilst this was sufficient to create interest and promote enough insight and confidence to try it in practice, additional tailored training with coaching and feedback would be required to promote competence:

. . . I think the day is enough for you to pick it up and understand what it's about but it's the practice that improves . . . . so having the feedback when you have seen a real patient and applied it would be useful.

(Participant 9, Physiotherapist; lines 206-218)

6.5 Discussion

6.5.1 **Summary of findings**

The results of this study lend support to the acceptability of the use of MI in respiratory care but raise feasibility issues regarding the need for further training, beyond a one-day workshop and concerns regarding the additional time required to deliver MI in practice. Participants saw potential in MI as an intervention for building patient motivation for change and perceived a value in using the patient-centred style that underpins MI to inform the other interventions and procedures that are used in respiratory care.

The one-day workshop that was delivered as part of this study was designed to give participants an insight into the spirit and principles of MI, an understanding of how it differs from traditional methods for motivating patients and provide opportunities to try out some of the skills with fellow workshop participants. Whilst it was not the original intention, some attendees left with sufficient confidence to try out what they had learnt in practice. These participants were encouraged by the responsiveness of their patients and the overall effectiveness of the approach. They attributed these positive outcomes to empathic listening and the overall evocative, patient-centred style that characterises MI.

Participants involved in delivering PR programmes perceived that MI would be helpful for promoting engagement, particularly with the physical activity component. They described MI as a useful approach for navigating what can be challenging conversations that influence patient motivation and ongoing commitment. Examples included discussing obstacles to exercise, such as fear of breathlessness, and working constructively with patients who are depressed. The view that MI represents a useful alternative to more paternalistic approaches to promoting behaviour change, that patients may have previously experienced, was also shared.

Participants described several barriers to integrating MI within their routine practice. MI was viewed as taking a significant amount of time to deliver and this was considered potentially problematic within a time-pressured service.

Beyond service-related pressures, a clinician's professional identity was considered relevant to the adoption of MI in clinical practice. One participant proposed that discussing psychosocial issues does not always accord with a clinician's perception of their role and indicated that the content of such discussions may not sit comfortably with them. It was felt that these things might make it difficult to adjust to the style of MI. Should MI be adopted in practice, it would be necessary to review programme structures and ensure that clinicians are given adequate time and support to enable a successful integration.

As many participants themselves admitted, a one-day workshop was not sufficient to promote competence in MI. This experience is consistent with randomised controlled trials (RCTs) measuring the effects of different training approaches on MI skill in other professional groups (Barwick et al. 2012; de Roten et al. 2013; Schwalbe et al. 2014; Madson et al. 2019) and more broadly with training studies involving similarly complex interventions such as cognitive behaviour therapy (Herschell et al. 2010; Rakovshik and McManus 2010). These studies highlight the importance of follow-up training in the form of coaching and feedback on practice, a point that was recognised by participants in this study.

It is not yet known how much and what type of MI training respiratory clinicians would need to develop a level of skill that is capable of making a difference to long-term patient outcomes. Many participants viewed MI as a fundamentally different way of working with patients relative to their normal practice. With one exception, none had backgrounds in counselling and so the skills that are foundational to MI such as accurate empathy were novel and considered difficult to master. There is some evidence from the studies in the addictions field that prior counselling skills may influence overall MI skill acquisition and retention (Baer et al. 2004; Carpenter et al. 2012; Smith et al. 2012b; Moyers and Miller 2013) and a plausible model (declarative-procedural-reflective) exists that may help to explain this observation (Bennett-Levy 2006) (see description in section 4.3.4.2, page 96 and Appendix D, page 343). This means that respiratory clinicians who typically do not have prior training in counselling may find it harder to learn MI than psychologists and specialist counsellors, for whom MI training represents a refocusing of previously attained skills, a point that has been raised by others (Resnicow et al. 2002b).

For these participants, developing competence in MI would involve two discrete tasks: developing a new set of skills, as well as learning to suppress well-entrenched counselling habits that are incompatible with MI (Miller and Mount 2001). On-going training would need to focus on both things, and it may take longer and require more supervision to master MI than has been necessary for clinicians with psychology and/or counselling backgrounds.

A small number of participants recognised elements of MI within their normal practice. One, perceived that she was already using most of the components despite not having had any prior

training. It had been anticipated that some participants might perceive similarities between MI and their routine clinical practice. MI has been described as a refined form of guiding that is patient-centred and draws on skills such as asking, informing and listening that are often used in everyday practice (Miller and Rollnick 2009). On first exposure, MI can appear deceptively simple; a flowing conversation in which the patient is engaged and becoming increasingly committed to the change side of their ambivalence (Rollnick and Miller 1995). Some of the skills may be familiar to an observer, though the strategy underpinning the specific way they are used may not be so obvious (Miller and Rollnick 2009). Monitoring and responding to patient reactions on a moment-by-moment basis, attending to the unspoken meaning of what the patient has expressed, as well as arranging the conversation in a way that encourages the patient to explore their ambivalence in depth are examples of MI components that are not immediately apparent and are difficult to discern following a brief workshop.

These participants' descriptions of their practice revealed broad similarities with MI but did not reflect the refined use of skills or the strategy that underpins it. This suggests that the workshop failed in its aim to help participants to distinguish MI from normal consulting. For some, gaining such an insight may be a gradual process and may require a different type of training modality than a group workshop to achieve.

Miller and Rollnick (2009) argue that clinicians seldom develop skill in MI without specific training. That a small number of participants in the present study believed that they were already using MI is concerning since self-ratings share little variance with objective measures of MI skills used in practice (Wain et al. 2015). Clinicians who leave a short workshop believing they are already using MI (or elements of it) may not perceive a need for further input or engage fully with training activities, a concern that has been highlighted previously (Miller and Mount 2001). Similar concerns have been raised by Blackmore et al. (2017) who reported that respiratory clinicians perceived less need for training in behaviour change involving MI to support the delivery of a COPD self-management programme than more technical aspects.

Inflated levels of self-efficacy for delivering MI raise particular training challenges. It is important to maintain a learner's confidence by reinforcing practice that is consistent with MI, but simultaneously highlight development needs in a way that does not trigger defensiveness or undermine motivation for learning. Providing objective feedback on samples of clinician's practice in a sensitive way may be a particularly useful element of an on-going training strategy.

6.5.2 **Strengths and limitations**

This work is novel in its focus on the feasibility of MI in its *pristine* form rather than a derivative of the method, which is a common feature when attempts are made to apply MI to health contexts

including those involving patients with respiratory conditions (de Blok et al. 2006; Wood-Baker et al. 2012; Kruis et al. 2014; Mitchell et al. 2014; Altenburg et al. 2015; Burtin et al. 2015; Holland et al. 2017; Horton et al. 2018). Using adapted forms of MI may be time-efficient in terms of intervention delivery and may reduce training requirements, but runs the risk that intervention 'failure' may be due to an inadequate dose or because the intervention did not contain all components that have been empirically or theoretically linked to its efficacy, rather than a failure of MI (Miller and Rollnick 2014).

This study has also provided some preliminary insights into clinicians' views of MI used as an adjunct to PR to enhance engagement and adherence. Identifying ways to extend and prolong the beneficial effects of PR has been identified as a key research question (Celli et al. 2015) and studies of interventions to encourage uptake and adherence to PR are now seen as a research priority (Jones et al. 2017).

Another strength is that this research involved clinicians from a range of different professional groups, and with different levels of experience of respiratory therapy. To date, most published work applying MI to respiratory contexts has only involved nurses. In the UK, physiotherapists are often the primary point of contact for respiratory patients referred for PR and are therefore frequently key to encouraging any behaviour change.

Despite the overarching research questions within this thesis focusing on PR clinicians, for pragmatic reasons, other respiratory clinicians attended the introductory MI training and participated in this study. This carried potential to limit the PR specific insights about the service-related factors that may influence adoption and implementation efforts, which would have helped in the planning of the follow-up training study (study 2). However, the views expressed by the sample regarding the challenge of developing MI skills by those without prior training in psychologically informed interventions, and the implications for training, were relevant and would probably generalise to PR clinicians.

The thematic analysis used in this research was primarily inductive, in that the themes were derived mainly from the participant narratives, rather than being aligned to a particular theoretical position. The author is aware that his prior exposure to MI training and implementation literature will have inevitably influenced his interpretations. As Braun and Clarke (2006) note, however, it is not possible for researchers to divorce themselves from pre-existing knowledge. Workshop participants were informed prior to consenting to join the study that the person delivering the MI workshop would also be involved in the analysis of interview data. Those with more negative perceptions of the workshop and of the utility of MI may have been dissuaded from participating to avoid offence or discomfort on questioning. Equally, those

who elected to participate may have felt inclined to share perceptions that were more complimentary and endorsed the approach.

The themes presented reflect the perceptions of clinicians who were sufficiently interested in MI to attend a workshop and interview, and other clinicians may hold less positive views of the utility of MI. Despite this caveat, the findings will be transferable to many clinicians working in this type of setting.

6.5.3 Implications for study 2: Learning and applying motivational interviewing

Consistent with the exploratory-sequential research design described in section 5.4.2.1 (page 134), the results of study 1 (clinician views) provided important insights that guided the development of the model for integrating MI within PR and the associated training package used within the subsequent training study (study 2: learning MI). These insights are summarised in Table 6-2 (page 165).

Table 6-2 *Summary of Study 1 Insights and Implications for Study 2*

Theme	Issue	Implication for study 2 (learning MI)
MI's relationship with routine practice	Clinicians vary in the extent to which they perceive MI as being distinct from their normal practice.	Teach how MI differs from usual practice sensitively thereby minimising defensiveness. Use MI as a training style (parallel process) to promote continued engagement in the face of difficulties.
	Variation in awareness of development needs and receptiveness to training.	Provide a safe and supportive environment in which clinicians feel comfortable exploring how MI might be different from what they normally do and whether it is worthwhile investing the time and effort to continue learning it. Avoid defensive reactions to sub-optimal engagement, remain curious whilst respecting autonomy.
	Seeing a benefit of a revised approach to motivating patients but lacking in confidence to deliver it effectively can be destabilising.	Evoke clinicians' experience of strategies they find helpful in motivating patients first and then describe how MI may build on these (to promote engagement and build confidence).

Theme	Issue	Implication for study 2 (learning MI)
Suitability for use as an adjunct to PR	MI is considered a useful adjunct to PR to address issues that influence engagement and adherence but would need to be used alongside other clinical tasks and procedures.	Consider the use of an intervention manual to guide integration into PR. Teach how to switch style based on need.
	Patient barriers to participation that could be addressed with MI include exercise not fitting with self-image, anxiety about breathlessness and depression.	Include identified patient issues within clinical vignettes used in training.
	MI considered helpful for minimising patient defensiveness.	Develop skills for responding to 'sustain talk' and 'discord' to minimise defensiveness.
Does MI fit with my role?	Clinicians not accustomed to addressing psychosocial issues.	Explore issues relating to professional identity and role.
	Concerns about managing psychosocial issues for example surfacing emotive/sensitive issues that clinicians feel ill-equipped to handle and keeping conversations focused to enable appointments to keep to time.	Address clinician's concerns regarding handling difficult situations including containing emotive issues, understanding the effect of emotions on motivation and keeping the conversation appropriately focused.
Implementing MI	MI considered by most to be a complex method that will take time to learn and adjust to.	Identify a realistic volume and schedule of training that is sufficient to address training needs together with convenient modes of delivery. Utilise individualised coaching and feedback on practice.
	Service demands (staff shortages, carrying vacancies) often mean sacrificing time for professional development.	Secure management approval for clinician involvement and confirm sufficient protected time is available to complete training activities in a timely manner (without breaks between coaching sessions that would undermine momentum in learning).
	Fast-paced clinical environment affords limited time to use MI.	Ensure procedures outlined within treatment manual enable integration within time-limited consultations and are sufficiently flexible to allow for local variation.

Note. MI = motivational interviewing; PR = pulmonary rehabilitation. Insights informed the MI intervention and associated training package used in study 2 (learning MI).

6.6 Conclusion

The findings of study 1 (clinician views) lend support to the acceptability of using MI in respiratory contexts such as PR programmes but highlight potential implementation and training issues for respiratory clinicians who wish to deliver MI effectively. The style of MI is fundamentally different from traditional approaches to working with patients, but this is not always immediately grasped by those exposed to it during short training courses. On-going training is necessary to become competent in the use of MI. The respiratory clinicians viewed MI positively and noted increased patient responsiveness when trying out skills in practice, but also perceived that more training time would be needed to enable them to embed MI within their practice. A summary of the answers to the research questions that were addressed by study 1 is provided in Table 6-3 (page 167).

Table 6-3 *Study 1: Summary of Research Questions and Answers*

Research question	Answer	Supporting evidence location
1) Do clinicians working in a respiratory context believe that motivational interviewing is worthwhile and could be integrated within their routine practice?	Considered worthwhile but with uncertainty about its feasibility in practice.	See section 6.4.1.1 (page 149), section 6.4.1.2 (page 150) and section 6.4.4 (page 157)
2) Do respiratory clinicians believe that they can deliver motivational interviewing competently?	No[a]	See section 6.4.2 (page 151) and section 6.4.4.2 (page 153)
3) What training requirements did respiratory clinicians foresee are required to enable them to deliver motivational interviewing competently?	Need for a safe and supportive learning environment. Ongoing coaching and feedback required.	See section 6.4.4.3 (page 160)
4) What might prevent motivational interviewing being delivered within clinical practice?	Service demands.	See section 6.4.4.1 (page 157)

Note. [a]The majority of participants believed that motivational interviewing was fundamentally different to their normal practice and perceived training would be necessary to develop competence. A minority believed they were already using at least some elements in their practice but were not clear about whether what they were doing was MI in its *pristine* form.

In this chapter, the first study in this programme of research exploring respiratory clinicians' views of MI was presented. In the next chapter, there is a description of the process used to develop the MI intervention and associated MI training package that is tested within study 2 (learning MI).

Chapter 7: Development of the motivational interviewing intervention and training package

7.1 Introduction

The development of the motivational interviewing (MI) intervention and associated training package is described within this chapter. This work corresponds to the development tasks outlined in Table 5-1 (page 130). The development phase of a complex intervention is described within the Medical Research Council (MRC) guidance as being critical to its future success. Key to this is being able to define the desired outcome and describe how change will be achieved. It also involves describing the intervention fully so it can be implemented as intended and replicated (Craig et al. 2008; Sermeus 2015).

The intervention development work completed as part of this PhD concentrated on the initial design of the model for using MI as an adjunct to PR. This was used as a focus for the training delivered within study 2 (learning MI). It was beyond the scope of the PhD to complete all stages of intervention design, although insights regarding acceptability and feasibility of the proposed MI sessions were gathered through study 2 (see section 7.2.3.2, page 181) and formally explored in study 3 (see section 9.4.3, page 271). Further development work in line with MRC guidance (for example to determine the degree of flexibility in the proposed intervention that is permissible to suit local circumstances) would be necessary prior to making more definitive recommendations ahead of formal testing. This additional work is described in section 10.4 (page 319).

The training package was created to teach PR clinicians the skills that are foundational to MI as well as the specific strategies that comprise each MI-based session within the process flow. The development of the training package was iterative with experience and feedback gained from training early cohorts within study 2 (learning MI) used to refine the training and tested with subsequent groups. Therefore, this chapter contains an explanation and rationale for the changes that were made. The author considered it important to collate all information relating to the initial design and optimisation of the training package gathered up to the end of study 2 (learning MI) to make it easier for the reader to see what had changed and why. The feasibility of the training package was evaluated further in study 3 (trainee experiences). The insights gained are reported separately (see section 9.4, page 248) with final recommendations described in section 9.5.5 (page 295).

The sources of information used to develop the logic model, MI intervention and associated training package are summarised in Figure 7-1 (page 171).

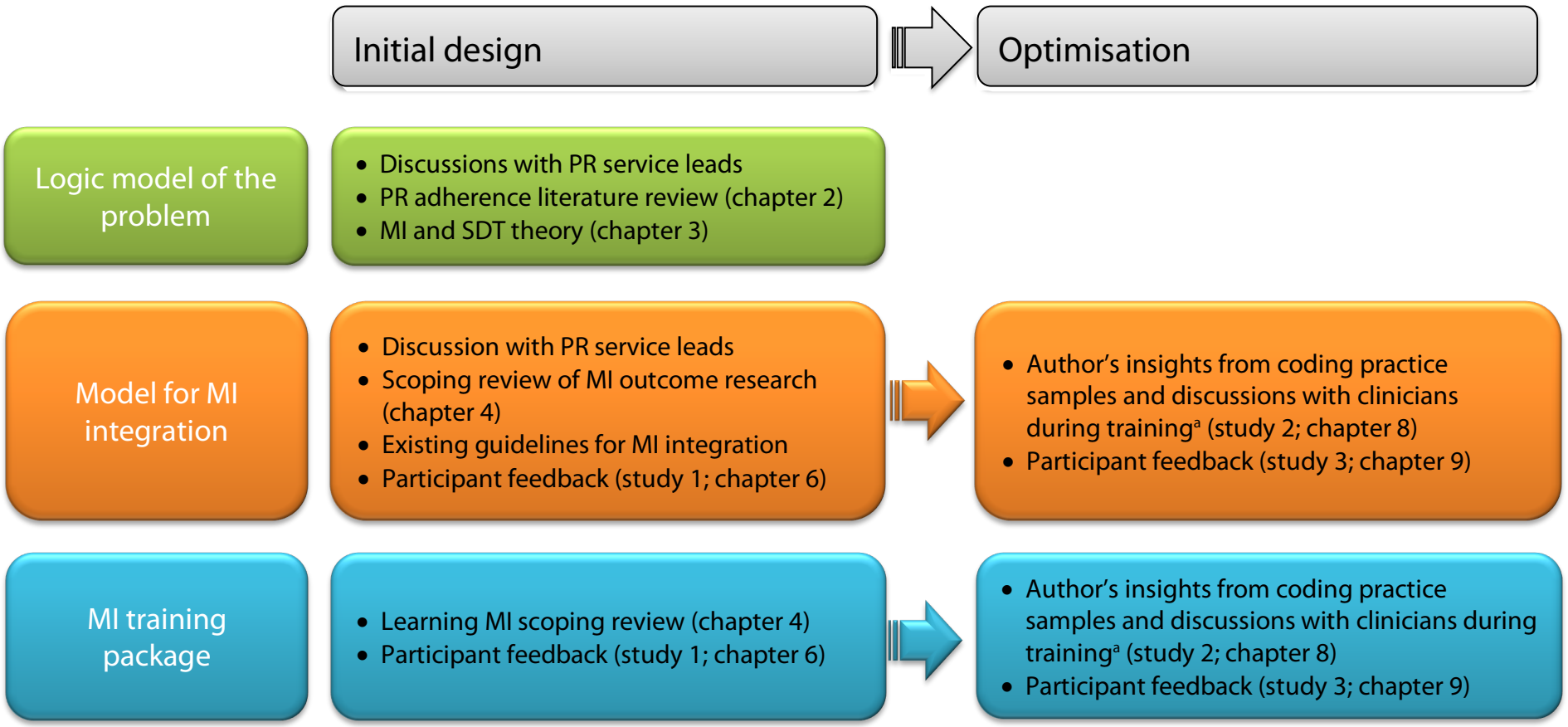


Figure 7-1. Sources of information used to develop the logic model of the problem of sub-optimal engagement with pulmonary rehabilitation (PR) and adherence to physical activity recommendations and the proposed model for integrating motivational interviewing (MI) and the associated training package.
Note. SDT = self-determination theory.
[a]Group workshops and individualised coaching and feedback sessions.

7.2 Model for using motivational interviewing as an adjunct to pulmonary rehabilitation

The initial design of the model for using MI as an adjunct to PR involved three stages: 1) creation of a logic model of the problem of sub-optimal engagement with PR and poor adherence to physical activity recommendations; 2) specification of objectives for using MI as an adjunct to PR; and 3) development of a process flow diagram proposing the timing, focus and duration of MI sessions within PR, and specification of objectives for each type of session (to address the issues identified within the logic model of the problem). At each stage, guidance provided by the intervention mapping framework was referred to (Bartholomew-Eldredge et al. 2016).

7.2.1 Logic model of the problem

The problem of sub-optimal engagement with PR and poor adherence to physical activity recommendations is represented within the logic model shown in Figure 7-2 (page 175) and represents the first stage of the intervention mapping process. Logic models provide a means of graphically representing a sub-optimal service or programme and can guide objective setting and planning of an improved design (Bartholomew-Eldredge et al. 2016; Rehfuess et al. 2018).

The insights that informed the model came from four sources. Service leads belonging to a local PR network shared information about the structure of services, the design and content of PR consultations and the engagement/adherence issues encountered in clinical practice. Respiratory clinicians involved in study 1 (clinician views) provided feedback regarding their experience of patients referred for PR and the focus and communication style they normally employ within routine consultations (see summary of insights in Table 6-2, page 165).

Relevant literature was reviewed to quantify the problem and identify potential explanations (see section 2.4.3, page 18). Finally, insights from MI and self-determination theory (SDT) were used to conceptualise the motivational issues that carry potential to undermine PR engagement and adherence. The source(s) of evidence supporting each of the programme related issues and the implications for the patient are shown within the model.

As described in section 3.8 (page 43), it has been argued that SDT provides insights that may lead to better differentiation of the different types of motivation that MI produces (Markland et al. 2005; Vansteenkiste et al. 2012). The next section draws on SDT to describe the motivational factors which may influence engagement with PR and adherence to physical activity recommendations.

A basic tenet of SDT is that the likelihood of sustained behaviour change depends on the quality of the underlying motivation. The theory postulates "that all behaviours can be described as lying along a continuum of relative autonomy, reflecting the extent to which the person fully endorses and is committed to what they are doing" (Markland et al. 2005 p. 816). If the referral for PR and subsequent intake consultation are underpinned by advice and education without soliciting the patient's own motivations and conducted in a way that undermines patient autonomy, then theoretically, the resulting motivation is externally regulated. Since participation is driven by external pressurising forces (to satisfy demands or anticipation of reward) rather than because the patient fully and freely values the behaviour, they may not engage optimally with the programme and may struggle to maintain physical activity afterwards when the intense support is withdrawn (Ryan and Deci 2000; Markland et al. 2005; Vansteenkiste et al. 2012).

Those who feel anxious about their health situation and/or experience guilt and shame regarding its cause may experience internal pressure to attend for PR (introjected regulation) (Ryan and Deci 2000; Vansteenkiste et al. 2012).. Whilst these reasons for change are partially internalised and therefore provide a stronger motivational force than external regulation, it is an unstable form because the internal compulsion to engage with PR sits in tension with the failure truly to value the activities involved (Markland et al 2005).

More enduring forms of motivation are those which are autonomously regulated. These occur when the person views the behaviour as leading to personally valued outcomes. This is particularly strong when the identification has been co-ordinated more broadly within the person's value system (Vansteenkiste and Sheldon 2006; Wagner and Ingersoll 2008; Ryan et al. 2011). The internal reasons for acting provide the incentive to invest effort and continue in the face of difficulties. According to SDT, the strongest forms of motivation are for those behaviours that are inherently interesting and enjoyable (that is intrinsically motivated). Whilst some patients who attend for PR experience exercise as enjoyable and stimulating, many will not. For these patients, viewing physical activity as a means of realising health goals and being able to live life by their core values is likely to represent the strongest form of motivation. Interventions such as MI that carry potential to alter the degree to which patients are personally invested in physical activity may result in more durable effects.

7.2.2 **Programme aims and objectives**

The aim of using MI as an adjunct to PR was to address the issues identified within the logic model of the problem shown in Figure 7-2 (page 175) and thereby increase:

1) patient attendance and programme completion rates;

2) the quantity and quality of exercise performed during PR;

3) physical activity between supervised PR sessions;

4) habitual physical activity after the PR programme has ended.

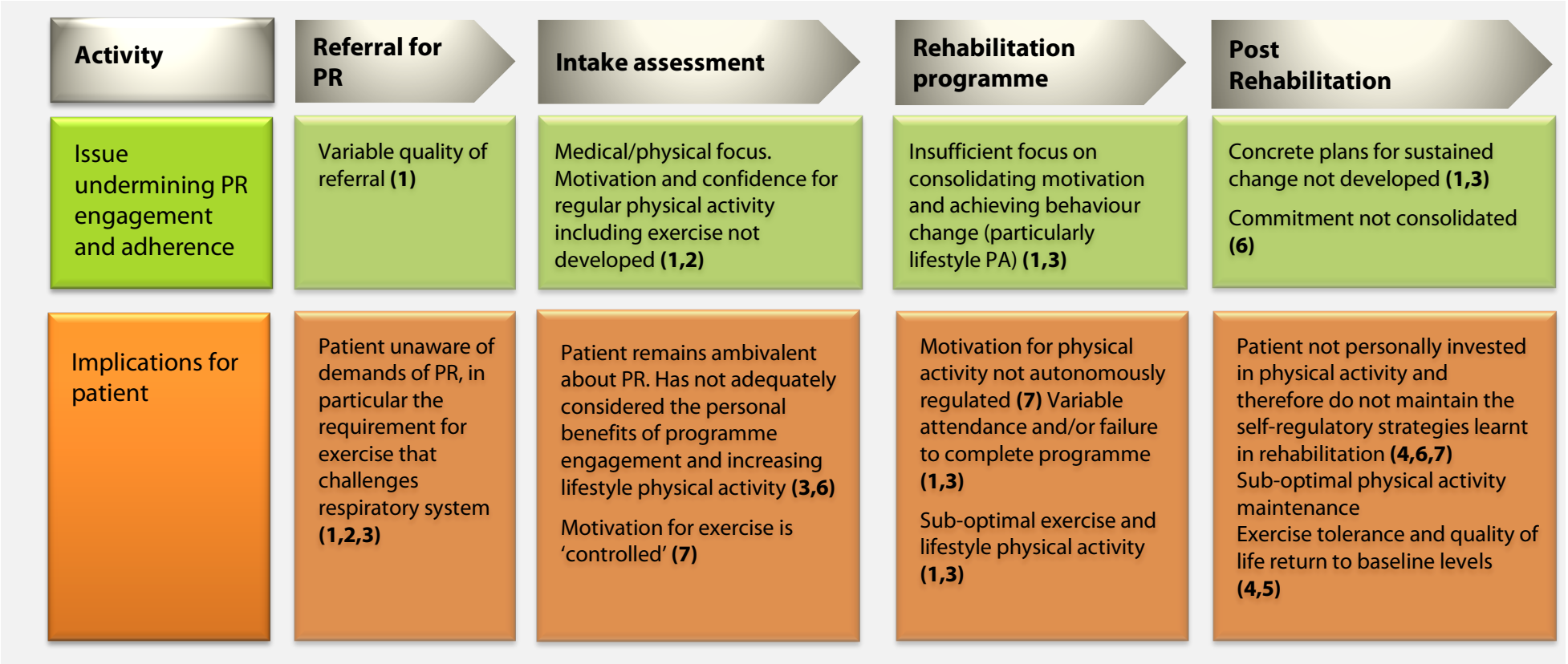


Figure 7-2. Logic model of problem of sub-optimal engagement with pulmonary rehabilitation (PR) and poor adherence to physical activity recommendations showing source of evidence.
Key to source of evidence: **1**: Discussions with service leads at pulmonary rehabilitation forums; **2**: Insights from study 1 (clinician views) **3:** Evidence review (section 2.4.3.1 Attendance and programme completion); **4**: Evidence review (section 2.4.3.3 Maintenance of benefits); **5**: Evidence review (section 2.4.3.4 Effects of pulmonary rehabilitation on physical activity); **6**: motivational interviewing theory; **7**: self-determination theory.

7.2.3 Programme design

7.2.3.1 Initial design

The process flow diagram shown in Figure 7-3 (page 179) represents the initial ideas for the use of MI within PR. The proposed intervention consists of a series of MI-based consultations delivered prior to, during and after PR. The process flow indicates the timing and anticipated duration of these appointments together with their motivational focus. The specific objectives of MI for each type of appointment, together with selected determinants that are expected to mediate any effectiveness of the intervention are detailed in Table 7-1 (page 180).

The intention is for PR clinicians to deliver these MI sessions. As described in section 4.3.2 (page 94), the ongoing contact that these professionals have with patients throughout PR provides an ideal context to develop strong, interpersonal relationships with patients. This means they are well positioned to deliver routine MI-based consultations and also identify and respond in a timely way to the need for additional ad-hoc MI input as the need arises.

The initial design of the MI intervention was informed by four sources of information. Firstly, service leads were consulted to gather their views regarding potential opportunities for MI integration and what would be feasible in clinical practice. A local PR network was used for this as its membership included clinicians from several different organisations, each with different PR structures and designs. It was deemed important to understand this diversity such that contextual factors that carry potential for influencing how the intervention operates could be accommodated within the design. Key feedback from members of this network was as follows:

i. Service leads considered enhancing patient motivation to be an important clinical task.
ii. Services are required to undertake an intake assessment prior to the commencement of the programme to determine eligibility, assess the suitability of exercise and to take baseline measurements. The latency between the appointment and programme start varies across programme structures.
iii. The intake appointment was seen as an ideal opportunity to discuss programme engagement and adherence issues with patients, although safety issues are typically prioritised in practice, and discussions about motivation do not always occur.
iv. There was interest in exploring ways to i) make the most of patient contact time using methods such as MI, and ii) increase the amount of time devoted to discussing motivational issues (though some reservations were expressed about the feasibility of this).

v. Offering specific appointments for MI is a consideration in circumstances where appointment duration does not allow for these types of conversation alongside other clinical tasks.
vi. All service leads considered it important to provide ongoing motivational support to patients. Opportunities to provide this differ across programmes. Offering telephone support was considered a viable option, particularly when attendance has declined.
vii. Follow-up appointments are routinely offered as patients complete PR. This typically involves taking follow-up measurements to determine the effect of the programme. The value of maintaining physical activity levels is often discussed at this time with invitations to join a maintenance programme where available. This appointment was considered an ideal opportunity to strengthen motivation and consolidate commitment, though formal discussions of this nature do not always occur.

A second source of information used to inform the initial design of the MI intervention came from respiratory clinicians involved in study 1 (clinician views). A summary of the insights is provided in Table 6-2 (page 165).

A third source was the review of MI outcome research within section 4.2 (page 63) that suggested a need for a minimum of two sessions and a combined volume of at least 60-minutes of MI.[28] A final source was existing guidelines for combining MI with cognitive behavioural treatments for psychological problems (the success of which is similarly dependent on full engagement with and adherence to treatment procedures). Zuckoff et al. (2015b) have published a treatment manual describing the use of MI as a prelude to psychotherapy for depression, which has been evaluated positively in several pilot studies and randomised controlled trials (RCT) (Swartz et al. 2006; Grote et al. 2007; Swartz et al. 2008; Grote et al. 2009; O'Mahen et al. 2013). This group have also explored the potential of combining MI with exposure and ritual prevention treatment for patients with obsessive compulsive disorder (Simpson et al. 2008; Simpson et al. 2010). The MI element included a short (15-30 minute) support consultation for patients who had relapsed or were struggling to adhere (Simpson and Zuckoff 2011; Zuckoff et al. 2015a). With permission from the first author (Zuckoff, A), the focus of the engagement session and support consultation were modified to address the motivational issues experienced by those referred for PR. Initially this took the form of a series of bullet points

[28] This is a tentative conclusion based on the reviewed evidence. It was not possible to draw strong conclusions regarding the minimum dose of MI that would likely be needed in this context. Many of the reviewed studies used MI to target multiple behaviours and there was a lack of precision in the reporting of the dose of physical activity focused MI actually delivered. Moreover, the majority of physical activity studies have used MI as a standalone intervention and reviews of MI across behavioural domains, for example Hettema et al. (2005), have indicated that it may take less MI to promote change when used as an adjunct to other treatments.

on PowerPoint slides and was used to support the training for the first cohort of participants within Study 2 (learning MI). Following participant feedback together with the thesis author's insights gained through training, this evolved into a comprehensive manual containing a full description of the aims, approach and example dialogue for each strategy used to support training. The PREAMP manual presented in Appendix L (page 401) is the version used to train the last two cohorts of participants within Study 2 (learning MI).

The suggested timing, duration and specific format of MI shown in the process flow represents a preliminary guide only, with a requirement for local tailoring to suit the design of each PR programme, available resource and patient need. Consistent with MRC guidance (Craig et al. 2008), although the function of the MI intervention is standardised (to explore and resolve ambivalence about change, increase confidence and commitment to change), the process flow allows for variation in the form of delivery across sites. For example, MI may be introduced through dedicated MI based consultations or delivered within routine appointments alongside other clinical tasks, with flexibility in the duration of each MI session permissible.

As discussed in section 3.6 (page 34), MI is designed to be delivered in a flexible way, with the duration, timing and number of individual appointments governed by patient need. Progression through its constituent processes should be contingent on patient response rather than a predetermined period of time available. Meta-analytical evidence shows that studies involving manualised MI yield smaller effect sizes than those that do not involve manuals (Hettema et al. 2005) and it has been argued that this may be because the types of manuals used imposed an excessively rigid structure that undermines clinicians ability to respond in the moment. The need for flexibility is reflected in the PREAMP manual developed to support clinician training in study 2, which warns against slavish adoption (see Appendix L, page 401).

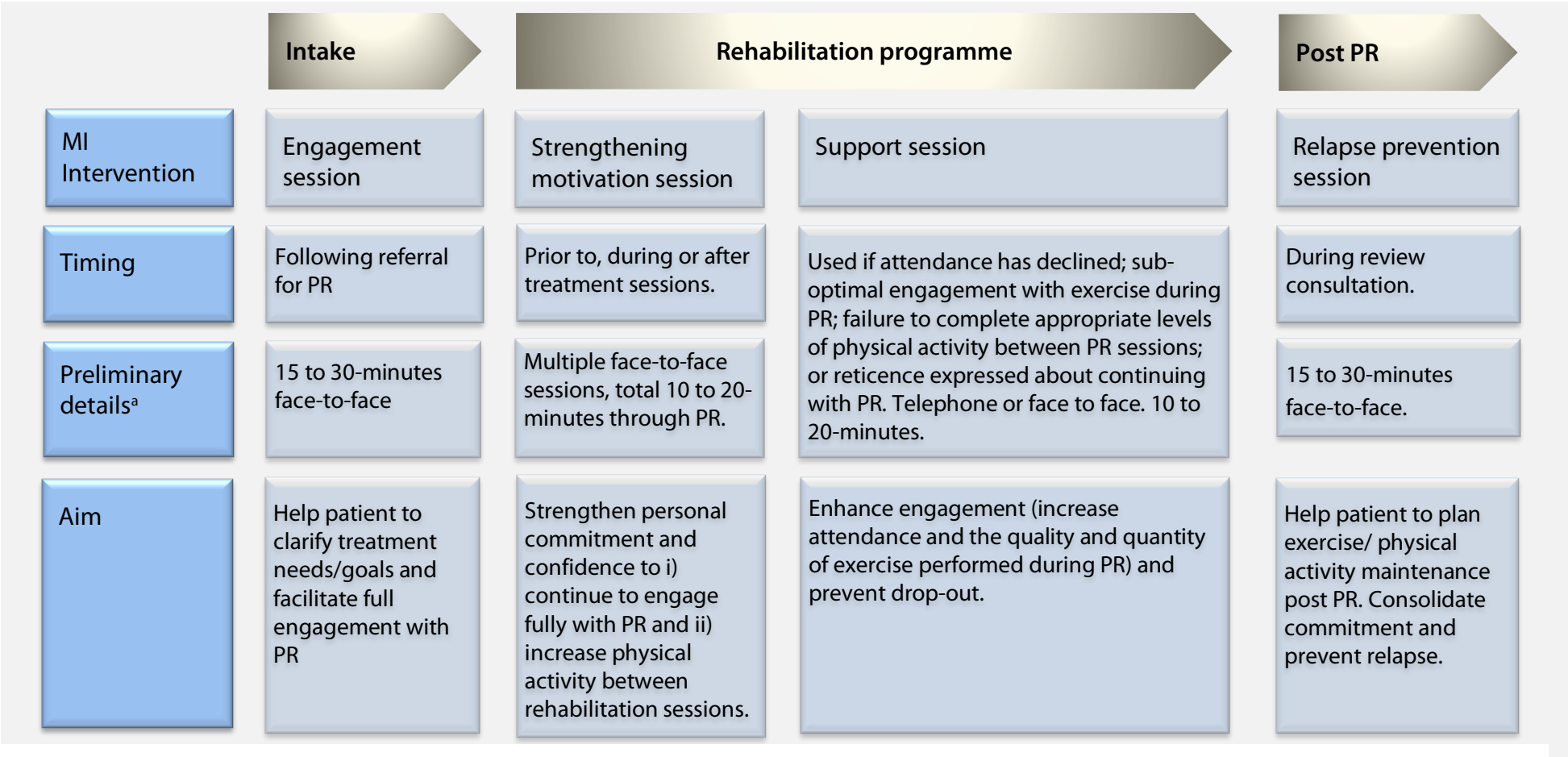


Figure 7-3. Process flow illustrating potential use of motivational interviewing (MI) as an adjunct to pulmonary rehabilitation (PR) based on literature reviews, discussions with service leads and insights gained from study 1 (clinician views).
Note. [a]This represents a preliminary guide. Delivery in practice will require modification to suit the design of each PR programme and available resource. Timing, duration and number of individual appointments to be governed by patient need and response.

Table 7-1 *Aims and Objectives of Each Component of the Proposed Motivational Interviewing (MI) Intervention Used as an Adjunct to Pulmonary Rehabilitation (PR)*

Timing	Motivational interviewing focus
Engagement session at intake consultation	Aim: • Help the patient to clarify their treatment needs and goals and to facilitate their full engagement with PR. Objectives: • For the patient to feel listened to and understood; • To communicate an understanding of the patient's perspective regarding their health situation; • Help the patient to see how the potential benefits of PR align with their values, goals and current health concerns; • To facilitate exploration and resolution of ambivalence about joining the programme; • If ready, problem-solve practical and psychological barriers to engagement, thereby strengthening commitment.
Strengthening motivation session(s) during PR programme	Aim: • Strengthen personal commitment and confidence to i) continue to engage fully with PR and ii) increase physical activity between rehabilitation sessions. Objectives: • For the patient to feel listened to and understood; • Reinforce early successes with PR exercise, thereby building confidence; • Strengthen motivation to continue with exercise through exploring short term physical and psychological benefits experienced; • Facilitate exploration and resolution of ambivalence about increasing physical activity between rehabilitation sessions; • When ready, explore opportunities to increase physical activity and develop a plan of action that includes expectations for change and implementation intentions.
[a]Support consultation	Aim: • To enhance engagement (increase attendance and the quality and quantity of exercise performed during PR) and prevent drop-out. Objectives: • Consolidate/develop previously established rapport • Explore and acknowledge difficulties that the patient has been experiencing; • Reinforce patient's efforts; • Identify key motives for continuing/increasing engagement with PR (attendance, exercise/physical activity); • Problem solve barriers that have been experienced/are anticipated in the future; • Consolidate/build commitment.

Timing	Motivational interviewing focus
Post PR relapse prevention session	Aim: • To help the patient to plan exercise/physical activity maintenance post rehabilitation. Consolidate commitment and prevent relapse. Objectives: • Consolidate rapport; • Strengthen motivation to maintain physical activity levels through exploring and reinforcing the physical and psychological benefits patient has experienced to date; • In instances where patient is disappointed with progress and/or expresses low motivation/confidence to continue -listen to and acknowledge their experience and explore ambivalence by drawing on strategies from 'support consultation'; • Problem solve barriers to physical activity maintenance; • Develop an updated plan for physical activity maintenance that includes expectations for change and implementation intentions • Agree a process for review.

Note. MI = motivational interviewing; PR = pulmonary rehabilitation. Adapted with permission from "Motivational interviewing as a prelude to psychotherapy for depressed women" by A Zuckoff, HA Swartz and NK Grote (2015b) IN: H Arkowitz, WR Miller and S Rollnick (eds) *Motivational interviewing in the treatment of psychological disorders* (2nd Edition). New York: Guilford Press 136-169 and "Enhancing the effectiveness of exposure and response prevention in the treatment of obsessive-compulsive disorder: Exploring a role for motivational interviewing" by A Zuckoff, IC Balán and HB Simpson (2015a) IN: H Arkowitz, WR Miller and S Rollnick S (eds) *Motivational interviewing in the treatment of psychological disorders* (2nd Edition). New York: Guilford Press 58-82.
[a]Used in circumstances where the patient's attendance has declined; they have been reluctant to engage with the exercise component of PR at the appropriate level; they have struggled to complete appropriate levels of physical activity between PR sessions; or they are reticent about continuing with the programme.

7.2.3.2 Acceptability and feasibility of the proposed MI intervention

Two objectives of this programme of research were to i) determine whether participants deemed the proposed MI based consultations to be relevant and appropriate for addressing the motivational challenges they encounter in clinical practice and ii) gather information regarding the proposed MI consultations to support refinement of their content for use with later cohorts of trainees within study 2.

To support this, the author made notes of his observations whilst coding practice samples during study 2, and gathered feedback from participants during feedback and coaching sessions. The insights gained are summarised below. Of note, whilst most of the consultations that were recorded and submitted for assessment purposes as part of study 2 involved the initial 'Engagement session', a large proportion of the 52 coaching sessions performed as part of study 2 focused on participants' attempts to implement other types of MI-based consultations ('Strengthening motivation', 'Support' and 'Post PR relapse prevention'). Insights were therefore

based on perceptions that relate to programme engagement, and adherence to physical activity recommendations during and post-PR.

Overall, the focus, style and content of the proposed consultations were deemed acceptable for addressing the engagement and adherence issues in PR. Some difficulties with specific skills were highlighted by participants (see description below). Whilst the points raised did not necessitate a modification to the proposed MI sessions, they were used to inform the training for later cohorts.

A small number of participants expressed difficulties eliciting patients' motivation for change during the initial engagement session. This was particularly the case with patients who had not exercised previously and who harboured low outcome expectations regarding the potential beneficial effects of change. These individuals tended to attribute their declining exercise tolerance and quality of life to the natural history of their respiratory condition and the aging process and exhibited a resigned acceptance to a perceived need to modify their lifestyle to accommodate this. The MI implication is to sensitively reframe patients' day-to-day difficulties and declining function as a recognisable and understandable problem, which can be addressed by PR.

Participants viewed each of the follow-up consultations positively, though some found it challenging to maintain the spirit of MI during the 'Relapse prevention' session. This was particularly evident in circumstances where patients were dissatisfied with the progress they had made through PR and/or did not share their enthusiasm for physical activity maintenance. Often, they would assume that patients were motivated to maintain physical activity levels after the programme or would succumb to the righting reflex, providing unsolicited advice about the benefits of doing so.

A key feasibility issue relates to the limited time available within existing programme structures to discuss programme engagement and adherence issues with patients. When study 2 was conceived, the author had assumed that participating clinicians would be able to extend contact time with patients to enable the integrate MI and experiment with their skills. In reality, host organisations afforded participants little flexibility in this regard, and they were expected to implement what they could within existing structures. The restricted time made it difficult to complete all elements of each MI consultation detailed in the PREAMP manual and achieve the depth of discussion advocated during training, particularly whilst participants were at the novice stage of skill development, with relatively inefficient MI skills. When recording consultations for assessment purposes, to best evidence their abilities, participants disclosed having to use consultations where there were few negative consequences of running over such

as the last the last appointment of a clinic or where a patient cancellation had created a gap between appointments.[29]

The next stage of intervention development involves identifying the degree of tailoring of the MI intervention that is possible to suit local circumstances without compromising its active ingredients. This is described in section 10.4 (page 319) as a subject of future research. Based on the consistency of feedback gathered through study 2 regarding time pressures, it is envisaged that services would need to provide additional consultation time to enable clinicians to achieve the objectives of each consultation should they adopt MI.

The feasibility issues presented here were formally explored in study 3 as part of a broader evaluation of trainees' learning and implementation experiences (see section 9.4.3, page 271).

7.3 Development of the motivational interviewing training package

7.3.1 Initial development

An objective of the research reported within this thesis was to develop and optimise a MI training programme for respiratory clinicians involved in PR. The initial package that was used to train the first cohort of participants is presented in Appendix J (page 385). The content and delivery of training was informed by the insights gained from the review of literature on learning MI (section 4.3, page 91), the scoping review on the effectiveness of MI training for health professionals (section 4.4, page 98), together with the views of respiratory clinicians involved in study 1 (summarised in Table 6-2, page 165).

7.3.2 Optimisation of the training package

Some elements of the training package were refined for successive cohorts based on participant feedback together with the author's observations whilst training and coding practice samples. The revisions were guided by the declarative-procedural-reflective (DPR) model of therapist skill acquisition and refinement proposed by Bennett-Levy (Bennett-Levy 2006; Bennett-Levy and Beedie 2007; Bennett-Levy and Thwaites 2007; Bennett-Levy and Finlay-Jones 2018). The key modifications together with the rationale are presented in Table 7-2. (page 184).

[29] Reflected in the feedback provided by participants through study 3 (reported in section 9.4.3).

Table 7-2 *Description and Justification for Refinements made to the Motivational Interviewing (MI) Training Package Used Within Study 2*

Issue	DPR model conceptualisation	Revision to training
Difficulty constructing reflective listening statements on demand.	Excessive cognitive demands associated with using several elements of the declarative and procedural systems concurrently: interpersonal perceptual skills used to attend to and mentally represent the patient's experience; interpersonal relational skills used to construct statements capturing what was said, meant and/or felt.	Introduction of exercises designed to deconstruct the skill of reflective listening into its constituent parts to reduce the cognitive demand. Step 1: written patient statements provided (reducing demand on short-term memory), step 2: learner makes notes on what has been said and possible meanings, step 3: learner constructs reflective listening statements embodying each hypothesis. Progression involves use of audio recorded patient statements, verbalising patient experience (rather than writing them) and reducing time available to generate reflective listening statements.
Difficulty supressing righting reflex and achieving the spirit of MI.	Well entrenched, automatic patterns of responding derived from experience (self-schema) interfere with self-as therapist schema processing. Implicit beliefs and rules from self-schema (e.g. the consultation has failed if patient does not follow my advice) translate into therapist attitudes, beliefs and assumptions which undermine MI practice.	Introduction of mindful practice element to selected skill-based exercises. For example, prior to step 2 in the exercise above, learner describes their natural responding inclination. The aim is to learn to recognise and acknowledge the righting reflex without acting on it. Exploration of attitudes, beliefs and assumptions within self-schema which make it more likely the learner will succumb to the righting reflex and that reinforce this pattern of responding. Increased emphasis on real play[a]. When learner is in the 'speaker's chair' they experience the impact of MI on a personal level. The insights gained and implications for their own practice are reflected upon during a debrief. Whilst in the 'clinician chair', the learner is encouraged to attend to the speaker's reactions and experience. Thus, the skills are mentally represented in two systems with two paths for retrieval – the self-schema (based on the personal experience) and the self-as-therapist schema (based on the learner's observations when they enact the skills).

Difficulty integrating skills into practice. Mechanistic application of strategies and difficulty with consultation flow. Concern regarding 'getting lost' results in decreased focus on patient's experience.	Cognitive burden associated with high volume of declarative knowledge. Translating declarative knowledge into procedural skills involves repeated practice. Initially practice feels contrived and awkward as the self-as-therapist system develops. Own style develops over time as the self-schema re-emerges.	Introduction of flexible manual to guide implementation efforts (see PREAMP manual Appendix L, page 401). Overall aim of each strategy emphasised, with example language provided to support learner prior to them developing their own phraseology/style. Additional encouragement provided for learners to evaluate their performance on the basis of its effect on the patient's behaviour rather than their own. 'Rule of thumb' approach adopted in which learner is taught strategies to use when they encounter difficulties (for example to summarise if they get 'stuck' or reach an impasse). The aim to provide the security of something to fall back on to reduce performance anxiety, allow for greater flexibility in the practice of MI and foster increased attention on the patient's behaviour rather than their own.
Effectiveness of coaching undermined by learners' ability to recall specific details regarding the pattern of language within patient consultations. Difficulty conceptualising challenging elements of an interaction.	One or more of the following: Deficiency in declarative knowledge and or procedural skills: learner unable to accurately conceptualise the problem and does not know what to attend to in-session; Limited attentional resource to reflect-in - action, attention focused on technical matters. Unrefined interpersonal perceptual skills-missing key elements of the interaction; Long term memory unable to recall specific elements of interaction.	Recordings of practice used during coaching to enable a focus on elements of the interaction that is not possible when relying on learner recall (for example nuance and pattern of language, interpersonal dynamics). To maximise the benefit of coaching, learner is encouraged to prepare by reviewing each recording ahead of the scheduled supervision session, to identify specific issues to focus on and to make notes about their conceptualisation of the problem and ways to improve.

Fluctuations in perceptions of competence and confidence to deliver MI effectively.	Increased awareness of the complexity of MI and the discrepancy between actual practice and competency standards. Self-schema involvement may mean this interferes with MI practice and skill development.	[b]Prior to training, shape expectations regarding the potential for fluctuations in perceptions of competence and confidence to reduce the risk of learners becoming disheartened. To pre-empt the risk, discuss factors that may lead to setbacks such as a difficult session with a patient. Emphasise that the training programme introduces learners to MI and that it is expected that competence and confidence will continue to develop through practice after its completion. Prior to feedback element of training, negotiate how results of MITI analysis will be used and if/when discrepancies between actual and competence thresholds are highlighted. Remain receptive and non-judgmental to create the conditions of support in which learners feel comfortable talking about the difficulties they are experiencing in an unguarded way, and to maximise the likelihood they remain engaged with training when experiencing setbacks. Help the learner to identify a way of thinking that may protect them against setbacks. Discuss experiences of challenging consultations during coaching to ensure they are appropriately represented at an emotion level.

Note. DPR = declarative-procedural-reflective model; PREAMP = 'Promoting exercise adherence using motivational interviewing blended with pulmonary rehabilitation' intervention manual developed by the thesis author.
Insights informed by "Therapist skills: A cognitive model of their acquisition and refinement" by Bennett-Levy J (2006). *Behavioural and Cognitive Psychotherapy* 34(1): 57-78 and "Self and self-reflection in the therapeutic relationship: A conceptual map and practical strategies for the training, supervision and self-supervision of interpersonal skills" by J Bennett-Levy and R Thwaites (2007) IN: P Gilbert and RL Leahy (eds) *The therapeutic relationship in the cognitive behavioral therapies*. London, UK: Routledge 255-281.
[a]Real play in this context involves trying out MI skills with a speaker who discusses a behaviour that they are actually ambivalent about changing, rather than role-playing a made up scenario or acting like a patient they have previously treated. [b]Modifications informed by "The ups and downs of cognitive therapy training: What happens to trainees' perception of their competence during a cognitive therapy training course?" by J Bennett-Levy and A Beedie (2007) *Behavioural and Cognitive Psychotherapy* 35(1): 61-75.

7.4 Conclusion

In this chapter there has been a description of the iterative process used to develop the MI intervention and associated training package. This drew on several sources of information including; feedback provided by PR service leads, reviews of relevant literature, existing MI intervention manuals, and observations and feedback provided through the first two studies presented within this thesis.

The issues presented within this chapter were explored further within study 3 as part of a broader evaluation of trainees' learning and implementation experiences (see section 9.4.3, page 271). The implications for further development work are presented in chapter 10 (see section 10.4, page 319).

In the next chapter, the second study in this programme of research is presented. This explored the feasibility and impact of the MI training package within a group of PR clinicians.

Chapter 8: Study 2 Learning and applying motivational interviewing

8.1 Introduction

Study 2 was designed to explore the impact of workshop training and on-going supervision on motivational interviewing (MI) skills within a group of clinicians involved in the delivery of pulmonary rehabilitation (PR). This study constituted the second part of the exploratory sequential mixed methods project described in section 5.4.2.1 (page 134). Insights gained from study 1 (see Table 6-2, page 165) informed the model for using MI as an adjunct to PR and the associated training package used within this study (see process described in section 7.2, page 172 and section 7.3, page 183).

8.2 Research aim and questions

Aim: Explore the feasibility of a package of MI training for clinicians involved in PR.

Research questions:

Participation

1) What proportion of National Health Service (NHS) organisations approached participate in the research?
2) What proportion of eligible PR staff employed within participating organisations participate?

Training completion

3) What proportion of participants complete each element of the training package?
4) What is the latency between training components?
5) What reasons do participants provide for withdrawing?
6) What is the relationship between participant baseline characteristics and progression through training?

Motivational interviewing skill development

7) What is the impact of the training package on MI skill?
8) Does the training package lead to basic competency in MI?

8.3 Method

8.3.1 Design

The study employed a pre-post, single group quantitative design. This was believed to be most appropriate to address the research questions and was in keeping with the developmental nature of the training package and the focus on progressive modelling of the intervention.

8.3.2 Participants and recruitment

8.3.2.1 Selection criteria

Eligibility criteria were as follows: any physiotherapist, specialist nurse practitioner or band 4 assistant (technician, physiotherapy assistant or exercise specialist) involved in the delivery of a PR programme within one of the participating centres. To maximise study completion rates participants needed to be willing and able to submit four audio-recordings of physical activity counselling sessions with patients referred for PR over the course of the study.

As baseline skills are known to influence MI skill acquisition and retention (see section 4.4.3.4.3, page 119), and the author was interested in understanding the effect of the training package on the skills of MI novices, clinicians who had previously received more than 12-hours of MI training were excluded. This latter criterion has been employed in another study testing the impact of training on MI skill acquisition (Miller et al. 2004).

8.3.2.2 Sample size

A convenience sample of approximately 20 participants from at least four organisations was considered sufficient to capture variation in factors that have potential to moderate the effect of the MI training package on skill acquisition and implementation in clinical practice. Specific considerations that were determined through discussions with service leads from local PR programmes were the level, experience and professional backgrounds of clinicians responsible for delivery and different PR structures such as cohort and rolling programmes.

8.3.2.3 Recruitment

The flowchart in Figure 8-1 (page 192) details the recruitment strategy. Participants were recruited through two sources: The Physiotherapy Collaboration for Pulmonary Rehabilitation – a group of clinicians (primarily physiotherapists) leading the development and delivery of PR programmes in a region in the south of England; and direct contact with physiotherapy service leads/managers from local NHS organisations. Following a presentation about the research

given by the author, those who believed that members of their team might be interested in participating (or were interested in participating themselves) were issued with recruitment packs (information sheet and chief investigator's contact details) (see Appendix E, page 349). Those who expressed interest were contacted by the author by e-mail or telephone at which time any questions were answered. Where appropriate, a one-to-one appointment was arranged at the PR venue to take consent, complete the demographic questionnaire and to arrange the training schedule.

Recruitment of organisations occurred in three phases. During the initial phase (December 2011 – February 2012), details of the study were shared with service leads from five NHS organisations, of whom three (60%) agreed to be involved. Service leads from the other two organisations expressed interest but were unable to commit to the study because of uncertainties regarding the future commissioning of their PR programmes.

Across the three NHS organisations recruited in the initial phase of the study there were 17 staff members directly involved in the delivery of PR. Of these, 14 consented to participate. The remainder (three junior physiotherapists from two organisations) were unable to commit because they were about to rotate out of the PR service meaning completion of all study components would have been unfeasible. The recruitment of participants from the three NHS organisations lasted 29-months.

To achieve the recruitment target, it was necessary to increase the number of NHS organisations involved (since only a small number of clinicians were involved in PR delivery at each site). In the second phase of recruitment (September 2014 – April 2015), two additional organisations were approached and agreed to being involved. All 10 clinicians involved in PR delivery at these two sites agreed to participate (three in the first site, seven in the second).

The 24 participants undertook study 2 (learning MI) in six cohorts. The composition, start dates and duration of involvement for each of these six cohorts are represented in Figure 8-2 (page 193).

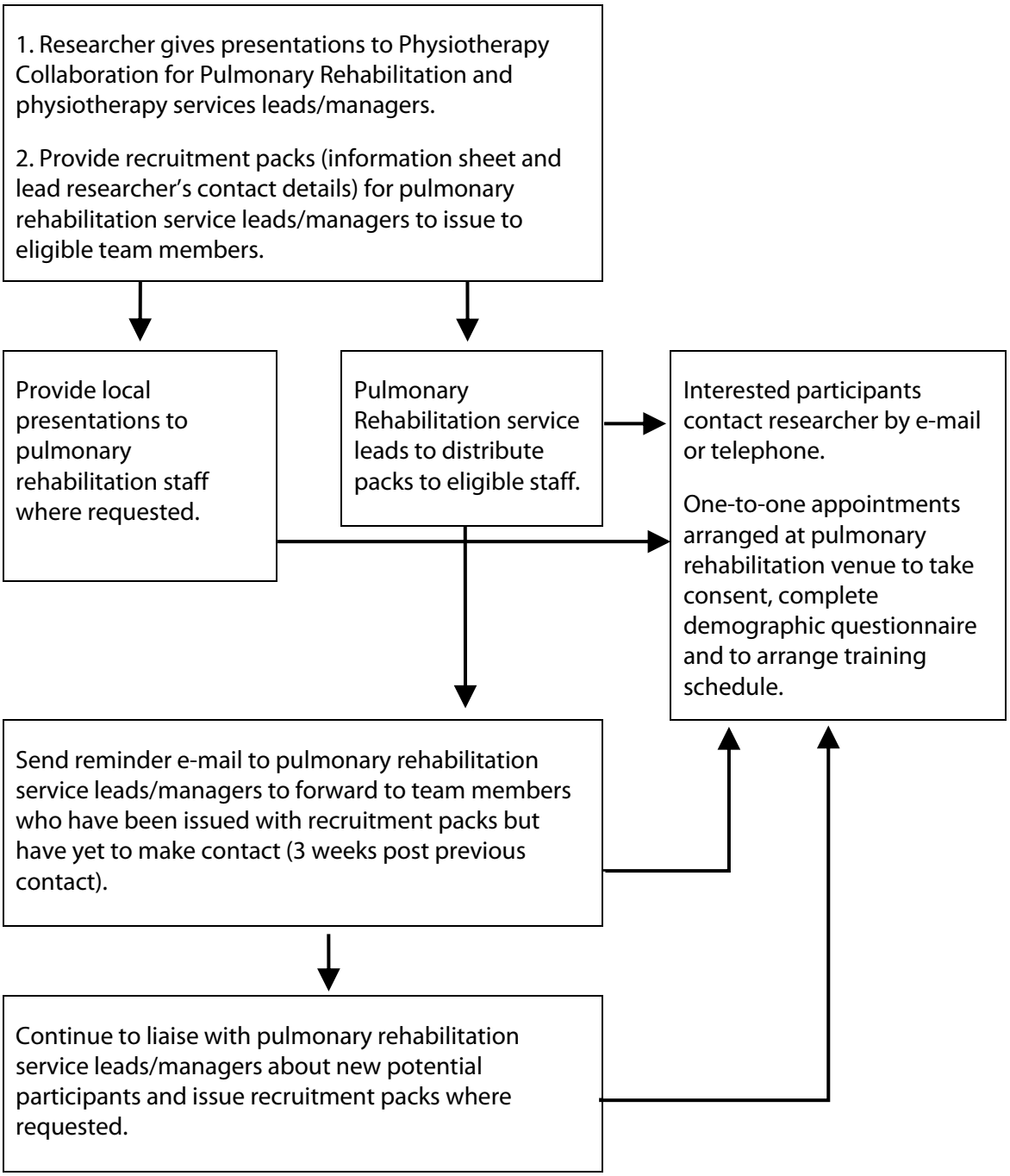


Figure 8-1. Study 2 participant recruitment flow chart.

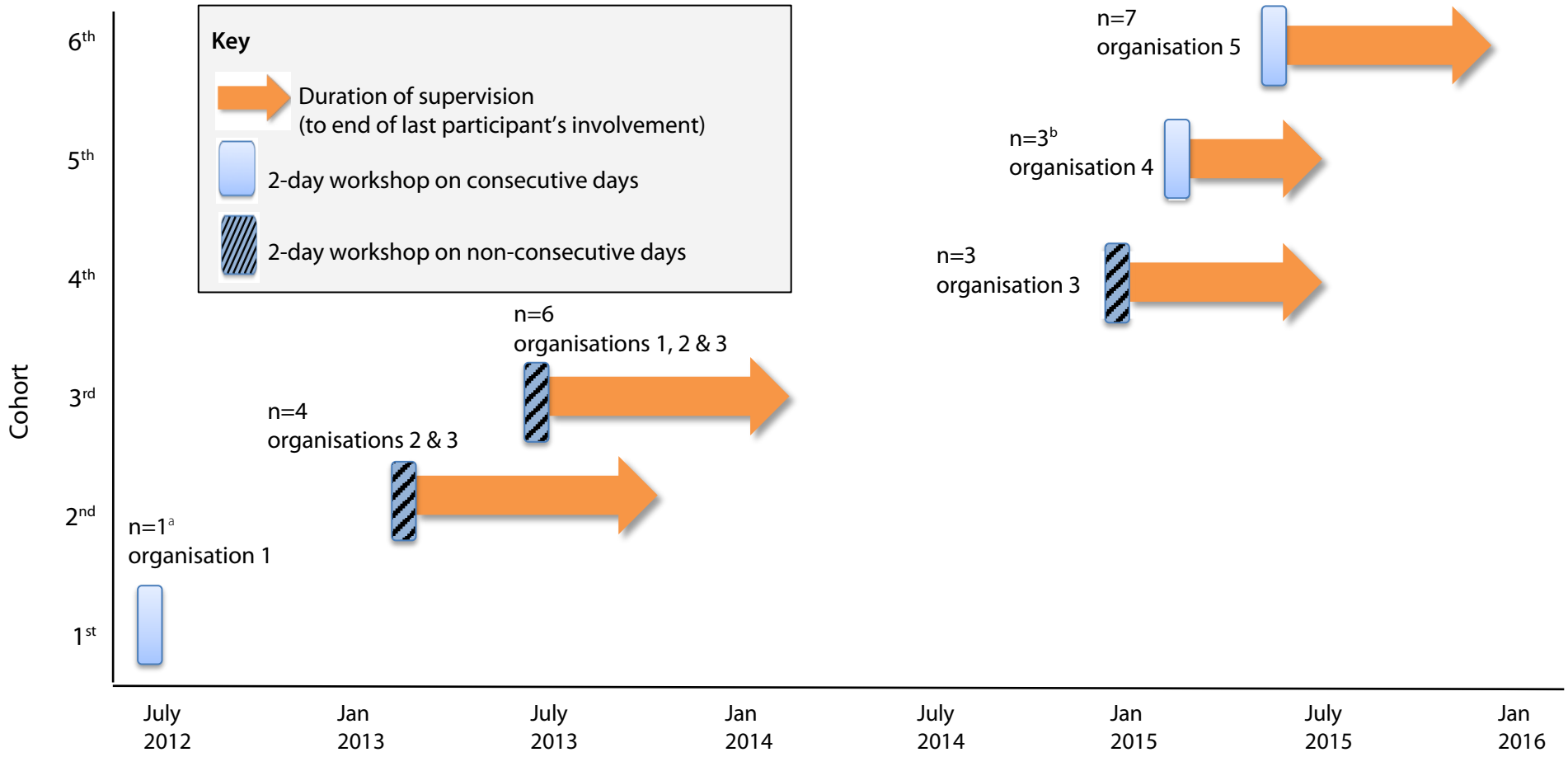


Figure 8-2. Workshop date, number of participants (n) and duration of supervision for each of the six cohorts involved in study 2.
[a] Participant was unable to complete any supervision activities and failed to provide any post-workshop practice samples. [b] One (of 3) participant was ill at the time of the workshop and was unable to complete any training.

8.3.3 Procedure

8.3.3.1 Ethics and research and development approvals

Prior approvals for the study were obtained from the National Health Service Integrated Research Application System (REC Reference Number: 11/SW/0358) and the appropriate Research and Development departments. The actual number of participants recruited (n=24) exceed the size of the sample specified in the protocol that received a favourable ethics opinion (n=20). The last site that agreed to be involved did so on the basis that any eligible team member could join the study. This was a relatively large service and seven team members wanted to participate, which increased participant numbers to 24. The Ethics Committee was informed of this increase and no further action was required.

8.3.3.2 Motivational interviewing training package

The design and delivery of the MI training package was informed by previous MI training research that is reviewed within section 4.3 (page 91) and section 4.4 (page 98) of this thesis, together with the insights gathered from respiratory clinicians involved in study 1 (clinician views), which are summarised in Table 6-2 (page 165). It consisted of an initial 2-day workshop (group based) followed by individualised supervision comprising three coaching sessions and two sessions in which participants received individualised feedback on their MI practice. The content and learning methods together with the aims and learning outcomes for each element of the training package are described in Appendix J (page 385). The 24 participants were trained in six cohorts with between one and seven participants in each cohort (see Figure 8-2, page 193). All training was facilitated by the author of this thesis. The first, second, fourth and fifth cohorts each comprised fewer than six participants so other clinicians from the host organisation participated in the workshop element of training to make the group format viable. Utilising fewer cohorts would have been more efficient and would have obviated the need to involve non-PR clinicians in the workshop. This was not feasible though, as participants were employed within geographically disparate organisations and recruitment from those organisations occurred at different times. Moreover, the intensity of the follow-up training precluded the involvement of larger cohorts given the author's full-time work commitments.

A key objective of this programme of research was to optimise the content of the training package (see section 5.3, page 129). The learning strategies were progressively refined using insights and feedback provided whilst training early cohorts within study 2 (learning MI). The rationale for the changes are described in section 7.3.2 (page 183). One of the changes involved the development of a MI intervention manual (PRomoting Exercise Adherence by blending

Motivational interviewing with Pulmonary rehabilitation: PREAMP) used to support training and guide implementation efforts (a copy of the final iteration is provided in Appendix L, page 401).

8.3.3.3 Motivational interviewing training schedule

The timetable of training and activities is presented in Figure 8-3. The timings were informed by the schedule used by Moyers et al. (2008) together with feedback about what would be realistic provided by service leads who expressed an interest in participating at the time the study was conceived. Participants were required to complete each timetabled activity prior to progressing to the next. This is at odds with other MI training studies that have provided deadlines for coaching and submission of practice samples and have reported compliance rates (for example Miller et al. 2004; Moyers et al. 2008). The aim of study 2 (learning MI) however, was to provide information that would help inform the development of a pilot trial testing the effect of MI used as an adjunct to PR. Part of this involved determining how long, in practice, it would take to prepare clinicians to deliver MI with an acceptable level of skill (given that full, rather than partial completion of training activities would likely be necessary to achieve this).

Timescale	Training/assessment activity
1-2 weeks prior to workshop	Baseline practice sample submitted
	2-day MI workshop
≤1-week post workshop	Post-workshop practice sample submitted
≤ 2-weeks post workshop	Individual feedback on post-workshop sample
1-2 months post workshop	3 x coaching sessions
2-months post workshop	Post-coaching practice sample submitted
2.5-months post workshop	Individual feedback on post-coaching sample
4-months post workshop	Final follow-up practice sample submitted

Figure 8-3. Study 2 planned schedule of assessment and training activities.
Orange cells refer to training activities and blue cells reflect assessment of MI skill.

8.3.4 Data collection

8.3.4.1 Participation

To enable the reporting of participation rates, details of the number of NHS organisations approached, the number who agreed to participate and where relevant, reasons for non-participation were recorded.

The number of clinicians approached within each participating NHS organisation and reasons for non-participation where relevant, were recorded by each service lead and shared with the author.

8.3.4.2 Participant characteristics

Information relating to each participant's age, professional background and prior training in MI and other counselling approaches was gathered via a questionnaire that participants completed after having consented to join the study. A copy is provided in Appendix I (page 383).

8.3.4.3 Training completion

Detailed records were kept of when each element of training was completed and when practice samples were submitted. The records also included details of email, telephone and face-to-face communication between the author and participants regarding reasons for delays and for non-completion.

8.3.4.4 Motivational interviewing skill

Several methods have been used in MI research to evaluate clinicians' MI skills and adherence in practice. Direct coding of client consultations is generally accepted as the most valid and reliable method for measuring the integrity of MI delivery (Miller and Rose 2009; Wallace and Turner 2009). Clinicians' own evaluation of their practice shares little variance with objective measurements of skill made by skilled coders (Miller and Mount 2001) even after supervision (Miller et al. 2004; Martino et al. 2009; Wain et al. 2015) and it is the objective ratings that predict client behaviour change (Thyrian et al. 2007; Gaume et al. 2009; Moyers et al. 2009; Daeppen et al. 2010; Cox et al. 2011). The specific approach adopted within study 2 (learning MI) was made following careful consideration of merits and limitations of the most commonly used methods. A description of those approaches and justification for the choices made by the author is provided in Appendix K (page 391).

In the two sections that follow there is a detailed description of the method employed within study 2 (learning MI).

8.3.4.4.1 **Collection of practice samples**

Prior to the initial workshop, participants were asked to submit a baseline audio-recorded sample (practice sample) of themselves talking with a patient that demonstrated their normal way of working to encourage engagement with PR or build motivation for physical activity, or both. Discussions could have occurred at any stage of the patient's rehabilitation. Limited information was provided beyond this to pre-empt participants revising their normal practice by introducing new elements or modifying the way they normally talk with patients. Role-played consultations were generally not accepted, although one participant (a service lead) submitted a recording of a role-played scenario with a colleague due to having limited patient contact at the time of commencing the study.

Additional practice samples were obtained immediately after the workshop and at 2 and 4-months later. These were not necessarily with the same patient and could involve any of the MI sessions that participants were taught to use during training - 'Engagement', 'Strengthening motivation', 'Support' or 'Relapse prevention' (see process flow shown in Figure 7-3, page 179).[30] Practice samples could involve MI delivered within a dedicated session or during a routine appointment alongside other clinical tasks. For each practice sample, participants could self-select which consultation to submit.

It was not realistic to expect participants to devote as much time as was proposed for each MI-session in the process flow (up to 30-minutes in the case of the engagement session).[31] Whilst service leads gave consent for team members to participate, no formal agreements were made to modify standard operating procedures or to extend contact time should it be necessary to facilitate the full introduction of MI. Participants were informed that up to 20-minutes of conversation would be analysed, but that anything more than 5-minutes would be acceptable.

A Sony ICD-PX312 digital voice recorder was provided to each participant for recording purposes. Reminder e-mails were sent ahead of the due date for each recording to maximise

[30] Since the focus of study 2 was the feasibility of the MI training package with an emphasis on skill acquisition, it was not necessary to stipulate which type of MI sessions that participants should record and submit for assessment and feedback purposes.

[31] To clarify, the process flow (figure 7.3) reflects the author's initial ideas about how MI might be integrated within PR (in ideal circumstances should MI be adopted and appropriately resourced). Feedback relating to participants' implementation experiences was gathered to support future development and piloting work (see section 7.2.3.2).

submission rates. Those who failed to provide a recording were contacted by e-mail or telephone to encourage submission.

Participants took written consent from each patient prior to audio-recording a consultation using a form provided (see Appendix E, page 349). To protect patient anonymity, consent forms were not returned to the author, rather participants were asked to submit a signed declaration stipulating that permission had been obtained from the patient and that this had been documented and stored in the patient's record file in keeping with the study protocol (see copy in Appendix E, page 349). Participants were discouraged from using the patient's full name during recorded consultations or disclosing any other potentially identifiable material. Recordings were deleted from the recording device once they had been successfully uploaded to the author's computer.

8.3.4.4.2 **Coding of practice samples**

MI skill prior to the workshop and at each follow-up point were assessed through analysis of the audio-recorded practice samples using the Motivational Interviewing Treatment Integrity (3.1.1) coding system (Moyers et al. 2010). The MITI scores provided the main outcome variables for the study and in the case of the samples provided immediately after the workshop and 2-months post-workshop, formed the basis of the individualised feedback on MI skills to participants.

A copy of the coding manual can be found at https://casaa.unm.edu/download/miti3_1.pdf. Coding normally involves a single coding pass, which focuses on clinician behaviour during a randomly selected 20-minute segment of a consultation. Global (gestalt) ratings of evocation, collaboration, autonomy/support, direction, and empathy are made by assigning a single number from a five-point Likert scale with descriptive anchors ranging from 1 (low) to 5 (high). The analysis also involves counting instances of specific clinician behaviours; open-ended questions, closed questions, simple reflections, complex reflections, MI-adherent behaviours (asking permission before giving advice, affirming, emphasising control, providing statements of support) and MI-non adherent behaviours (advising without permission, confronting, directing). These are combined to form summary measures: ratio of reflective listening statements to questions; percent open questions; percent complex reflections; and percent MI-adherent. The summary measures and provisional competency and proficiency thresholds are shown in Figure 8-4.

Summary measure	Computation	Basic competency	Proficiency
MI spirit rating	Average of evocation, collaboration and autonomy support global ratings (1-5 likert scales)	≥ 3.5	≥ 4.0
Mean global rating	Average of evocation, collaboration, autonomy support, direction and empathy global ratings (1-5 likert scales)	≥ 3.5	≥ 4.0
Reflection to question ratio	$\frac{\text{simple + complex reflections}}{\text{open + closed questions}}$	≥ 1.0	≥ 1.0
Percent open questions	$\frac{\text{open questions}}{\text{open + closed questions}}$	≥ 50%	≥ 70%
Percent complex reflections	$\frac{\text{complex reflections}}{\text{simple + complex reflections}}$	≥ 40%	≥ 50%
Percent MI-adherent	$\frac{\text{MI-adherent behaviours}}{\text{MI-adherent + MI-non adherent behaviours}}$	≥ 90%	≥ 100%

Figure 8-4. Motivational Interviewing Treatment Integrity code summary measures and provisional thresholds indicating basic competency and proficiency.
From *"The Motivational Interviewing Treatment Integrity (MITI) code: Version 3.1.1"* by TB Moyers, T Martin, JK Manuel, WR Miller and D Ernst (2010). University of New Mexico, Center on Alcoholism, Substance Use and Addictions (CASAA).

8.3.4.4.2.1 Psychometric properties of the Motivational Interviewing Treatment Integrity Coding Instrument

The psychometric properties of the MITI (1.0) are summarised in Table K-3 in Appendix K (page 396). The original version of the MITI (1.0) was derived through exploratory factor analysis of MISC scores from a large trial of MI training (Moyers et al. 2005b). Convergent validity was assessed using canonical correlations to compare the MITI (1.0) scores with the MISC exploratory factor analysis factor scores. The MITI captured 59% of the variability in the MISC factor scores (Moyers et al. 2005b). Responsiveness to change was established through comparison of MITI scores obtained prior to and following training in MI with significant improvements in key dimensions of MI skill detected by the instrument (Moyers et al. 2005b).

The MITI has been shown to have acceptable interrater reliability. Intraclass correlation coefficients (ICCs) for outcomes based on behaviour counts are usually in the good to excellent

range based on Cicchetti's classification,[32] although lower reliability estimates are typically observed for global ratings (see Table K-3, page 396). Coding experience has been shown to influence reliability. For example, Moyers et al. (2005b) reported higher ICCs for the most experienced coder pairing relative to the pairing with least experience.

The MITI (1.0) has been revised in line with MI process research and improvements in the way that key aspects of MI practice are defined (Moyers et al. 2016b). The current version at the time study 2 (learning MI) was devised was MITI (3.1.1). Key differences between this and the original version include the use of five global measures rather than two (evocation, collaboration, autonomy support, direction and empathy) and descriptive anchors to assist raters in making an overall judgment about performance on each dimension of skill. The results of two studies that have assessed the psychometric properties of the MITI (3.1.1) (Seng and Lovejoy 2013; Spohr et al. 2016) are summarised in Table K-3 (Appendix K, page 396).

Seng and Lovejoy (2013) examined the factor structure of the MITI (3.1.1) using principle components analysis, which revealed two distinct MI constructs. Specifically, global spirit, percent complex reflections and percent MI-adherent loaded onto one factor termed MI style and reflections-to-questions ratio and percent open questions loaded onto a second factor named MI techniques. This two-factor model explained 56.08% of the variance in MITI scores. Seng and Lovejoy (2013) assessed the predictive validity of the MITI (3.1.1) and found that greater adherence to MI measured by MI style and MI-technique factor scores predicted patient behaviour change at the 6-month follow-up. Spohr et al. (2016) also found that MI spirit ratings across two treatment sessions predicted the likelihood of the patient having initiated treatment by the 2-month follow-up. These two studies also reported that the MITI 3.1.1 has acceptable interrater reliability, though like the earlier versions, ICCs for global ratings tended to be lower.

8.3.4.4.2.2 Coder training

The author coded all practice samples following completion of a MITI coder training course. The training consisted of an initial 3-day workshop at Cardiff University (December 2010). Coding skills were then refined through individual practice on sample recordings and five, 2-hour coder-supervision meetings between January and April 2011. Training followed the stepped learning process recommended by the instrument's developers (Moyers et al. 2010) and included the use of pre-scored gold standard transcripts to evaluate coder competence. Training duration was approximately 35-hours which is broadly consistent with that recommended. The training was organised primarily to promote competence amongst a small

[32] Cicchetti (1994) standards of agreement (below 0.4 = poor, 0.40 – 0.59 = fair, 0.60 – 0.74 = good, and 0.75 – 1.00 = excellent)

group of individuals responsible for coding consultations within a separate MI-based intervention study (Channon et al. 2016) but the author who was known to the organisers was invited to participate.

8.3.4.4.2.3 Development of decision rules

Assessing MI integrity using the MITI normally involves coding a randomly selected 20-minute portion of a consultation (Moyers et al. 2010). In circumstances where a practice sample contained less than 20-minutes of MI, the entire MI portion was coded. Several participants submitted recordings of entire consultations in which they had attempted to use MI alongside other clinical tasks (history taking, establishing contraindications to PR, spirometry, measuring exercise tolerance and questionnaire completion) for which MI is inappropriate. In these circumstances, randomly selecting a segment of the consultation would have risked capturing non-MI elements, which as Moyers and Houck (2014) have noted can provide a misleading picture of the quality of MI delivered. Consequently, in keeping with recommendations from Moyers et al. (2016b) a set of decision rules was developed to guide the portion of each consultation that should be coded. These were: i) when the participant's intention was to use MI;[33] ii) where the discussion focused on the reasons for referral, physical activity or the demands of PR; and/or iii) elements of the conversation for which an MI style was appropriate such as at the beginning to promote engagement. The entire consultation was reviewed by the author prior to coding to identify the elements that met these criteria.

The total duration of each appointment devoted to addressing motivational issues was noted.

8.3.4.4.2.4 Blinding

It was not possible to blind the assessor to the identity of each participant when assessing practice samples with the MITI. Since the author was responsible for providing the MI training as well as the assessment of MI skill, the voice of each clinician participant was recognisable on the recordings. Furthermore, blinding the assessor to the point in training that the sample was provided was not possible. An ideal scenario would have been to assess all practice samples together at the end of the study. In addition to providing the outcome variables for the study however, the summary scores from the post workshop (second sample) and the post coaching (third sample) analysis were also used for feedback purposes as part of the training itself. These samples needed to be analysed soon after submission to allow for the provision of timely feedback to participants about the progress they were making in learning MI. To preserve the

[33] On submission of practice samples following MI training (post workshop, post-coaching and 4-month follow-up) participants indicated the portion where they had attempted to use MI.

blinding of assessor to the assessment point as far as it was possible; the assessment did not begin until both baseline and post training practice samples were submitted.

8.3.5 **Statistical analysis**

Appropriate summary measures were chosen to describe baseline characteristics of the sample and progression through the study based on the distribution of the data. For example, means and standard deviations were used to describe values that were normally distributed (where skewness and kurtosis were less than $\pm$ 2). Completers and non-completers were compared on demographic and baseline MITI scores using Fisher's exact test (for categorical variables), independent sample's t-test and Mann-Whitney U (2 samples) test (for continuous variables).

Multi-level modelling was used to evaluate the impact of training on each component of MI skill. This approach is used to analyse data where repeated measures (baseline, post-workshop, post-coaching and 4-month follow-up) are nested within each participant. It copes with missing data, which is particularly relevant as attrition meant that fewer participants contributed to successive follow-up points. Multi-level modelling produces more robust model coefficients than standard techniques such as repeated measures analyses of variance. Linear mixed model analysis was performed on MITI variables where the model residuals were normally distributed. A mixed effects Negative Binomial regression was used for variables that did not conform to this model assumption. For the linear mixed model analyses, post-hoc analyses with Bonferroni corrections were performed to determine where changes in MI skill occurred. This was first performed using baseline values as the reference point to determine whether post-workshop, post-coaching and the 4-month follow-up values differed. This was then repeated using the final 4-month follow-up as the reference.

Finally, a completer analysis was performed to analyse the impact of the entire training package. Effect sizes for each MITI variable were calculated by dividing the change in each MITI score by the pooled standard deviation. This was followed by clinical significance analysis conducted by comparing absolute values obtained at the 4-month follow-up with targets for basic competency in MI.

All analyses were performed using IBM SPSS version 25.

8.4 Results

8.4.1 Participants

Demographic details of the sample are presented in Table 8-1 (page 204). The mean time registered as a health professional was 15.08 years (±11.95). This does not include the exercise specialist and physiotherapy technician who were not eligible for registration. On average participants had spent 4.06 years (±3.91) delivering PR. Prior MI training averaged 3.28-hours (±5.08) though this was limited to brief group workshops and none of the participants had received formal supervision. For 17 participants, this was the first formal introduction to MI. Only one participant had prior training in other counselling approach (40-hours).

8.4.2 Progression through study

Attrition was evident at each stage of the study (see Figure 8-5, page 205). Of the 24 participants who started, 14 completed all training activities (workshop, three coaching sessions and feedback sessions on post-workshop and post-coaching practice samples) and 12 contributed to the 4-month follow-up. Service-related issues and changes in personal circumstances rather than negative perceptions of MI were given as reasons for not continuing. For example, a nurse participant working within an organisation undergoing significant change attended for the initial MI workshop but was unable to continue thereafter. A change the focus of her role from delivering PR to taking the lead for complex case reviews meant that she no longer had access to sufficient patients referred for PR to practise the skills and record practice samples.

Table 8-1 *Study 2 Participant Demographic Information (n=24)*

Demographic	Number (% of total)
Gender	
Female	23 (96)
Male	1 (4)
Profession	
Physiotherapist and service lead	5 (21)
Physiotherapist	11 (46)
Physiotherapy Technician	1 (4)
Nurse	6 (25)
Exercise Specialist	1 (4)
Time registered as a health professional	
0–2 years	2 (8)
3-9 years	7 (29)
10-19 years	5 (21)
20-40 years	8 (33)
Not applicable	2 (8)
Time spent delivering PR	
0-2 years	10 (42)
3-5 years	7 (29)
6-9 years	4 (17)
10-15 years	2 (8)
Missing information	1 (4)
Prior MI Training	
0	15 (63)
1-8 hours	3 (13)
9-12 hours	5 (21)
Missing information	1 (4)

Note. MI = motivational interviewing; PR = pulmonary rehabilitation.

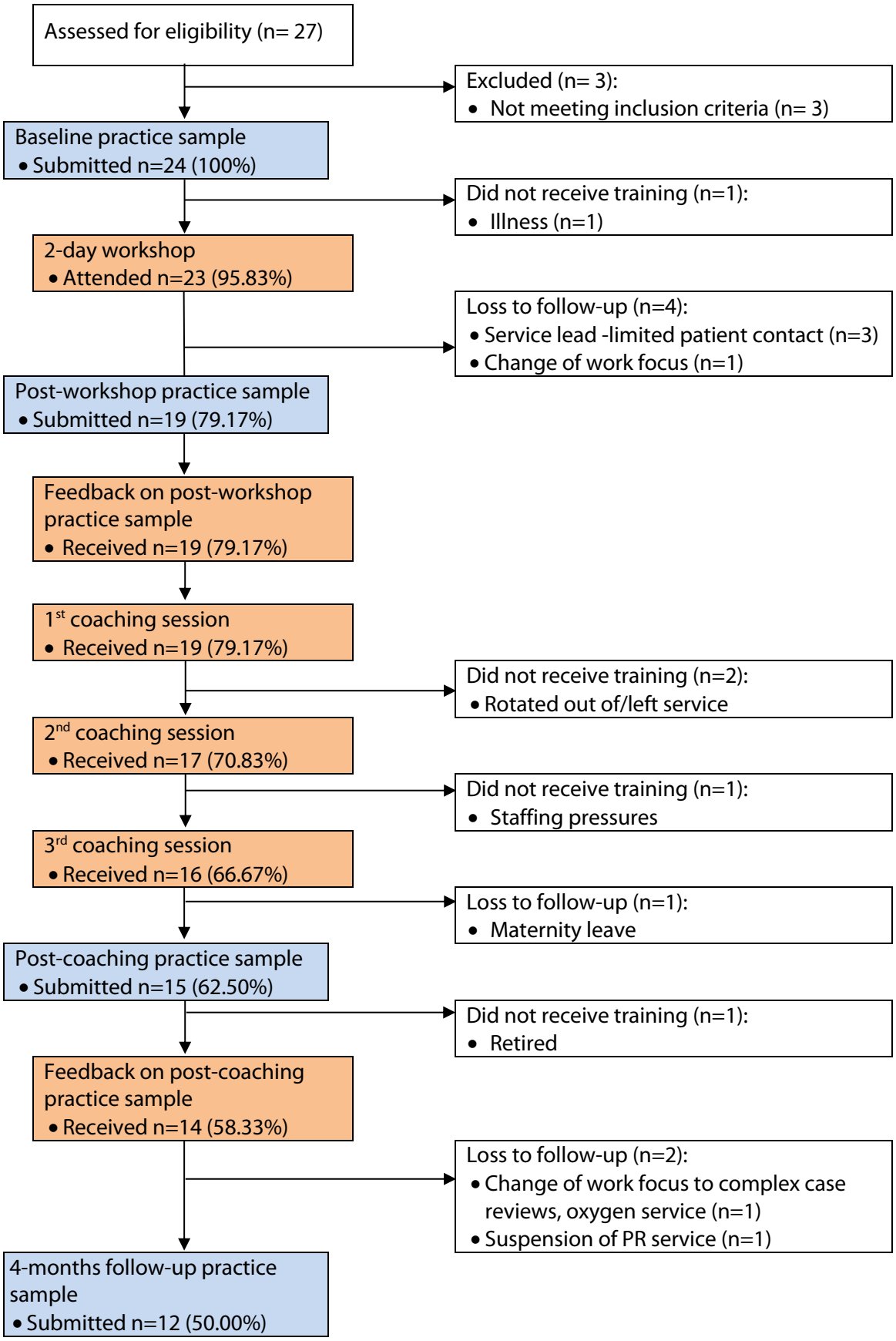


Figure 8-5. Study 2 consort flow diagram.

8.4.2.1 Baseline characteristics of completers and non-completers

The baseline characteristics of participants who completed all training elements and submitted practice samples at each assessment point (completers) and those who withdrew (non-completers) are shown in Table 8-2 (page 207).

No between group differences were apparent in years delivering PR or prior MI training. On average, non-completers had been registered as a health professional twice as long as those who completed the study ($p < .05$), many of whom occupied senior roles within their organisation. There were over twice as many MI-non adherent behaviours in the non-completers' practice samples relative to completers' ($p < .05$). Reasons for discontinuing are shown in Figure 8-5 (page 205). Five of the six nurse participants withdrew, though there did not appear to be differences in registration time between nurses and the other professions represented that might account for this.

Table 8-2 *Baseline Characteristics of Study 2 Completers and Non-Completers*

Characteristic	Non-completers (n=12)[a]	Completers (n=12)[b]	Mean difference (significance)
Profession			(p= .16)[c]
Exercise Specialist	0	1	
Nurse	5	1	
Physiotherapist	7	9	
Physiotherapy technician	0	1	
Time registered as a health professional: years	20.47 (±11.45)	10.12 (±9.87)	10.35 (p= .04)[d]
Not eligible for registration		2	
Time delivering PR: years (SD)	4.43 (±4.83)	3.65 (±2.76)	0.79 (p= .64)[d]
Missing information		1	
Prior MI training			(p=1.00)[c]
0-hours	8	7	
2-9 hours	1	2	
10-12 hours	3	2	
Missing information		1	
Baseline MITI analysis			
Global ratings			
Evocation	1.33 (±0.49)	1.67 (±0.65)	0.33 (p= .17)[d]
Collaboration	2.08 (±0.52)	1.92 (±0.79)	-0.17(p= .55)[d]
Autonomy support	2.67 (±0.49)	3.00 (±0.74)	0.33 (p= .21)[d]
Direction	4.00 (±0.60)	3.42 (±1.24)	-0.58 (p= .16)[d]
Empathy	1.75 (±0.75)	2.33 (±0.99)	0.58 (p= .12)[d]
Overall spirit	2.03 (±0.33)	2.20 (±0.55)	0.17 (p= .37)[d]
Mean global rating	2.37 (±0.27)	2.47 (±0.64)	0.10 (p= .62)[d]
Behaviour Counts			
Percent open questions	17.42 (±13.98)	14.33 (±12.75)	-3.08 (p= .58)[d]
Reflection: Question ratio	0.20 (±0.21)	0.49 (±0.62)	0.29 (p= .29)[e]
Percent complex reflections	2.42 (±8.38)	2.33 (±4.40)	-0.09 (p= .55)[e]
MI-adherent counts	0.33 (±0.65)	0.33 (±0.65)	0.00 (p= 1.00)[e]
MI-non adherent counts	3.42 (±2.31)	1.50 (±1.17)	-1.92 (p< .05)[e]
Percent MI-adherent	9.08 (±20.03)	13.89 (±22.05)	4.81 (p= .70)[e]

Note. ± = standard deviation.
[a]Withdrew prior to submitting 4-month follow-up practice sample. [b]Completed all training and assessment tasks. [c]based on Fisher's exact test. [d]based on independent sample's t-test. [e]based on Mann-Whitney U (2 samples) test.

8.4.2.2 Time taken to complete training components

Figure 8-6 (page 209) provides a comparison of the actual time participants took to complete each training and assessment activity against the anticipated timescale. The mean time taken to complete all training components (workshop, coaching and feedback sessions) was 20.55 weeks (±9.78) based on the 14 participants who completed those elements. This is over twice the anticipated timescale (10-weeks). The range was 9.14 – 42.71 weeks, with only one participant completing training in a timely manner – a junior physiotherapist who was keen to finish prior to rotating out of the service.

8.4.2.3 Time taken to submit practice samples

All 24 participants submitted a baseline practice sample prior to the 2-day workshop as required. The post-workshop and post-coaching practice samples were required in the week after the workshop and third coaching session respectively but took longer than this to submit. The mean latency across the 19 participants who submitted a post-workshop sample was 4.08 weeks (±3.70) and for the 16 participants submitting a post-coaching sample was 4.77-weeks (±5.16). There was substantial variability across participants with one taking over 9-weeks to submit the post-workshop sample and another over 15-weeks to submit the post-coaching sample.

The 12 participants who submitted the final 4-month follow-up practice sample did so outside the 6-week target (mean 7.25 ±6.17 weeks after their post coaching feedback session) again with considerable variability. Three of the six participants submitted a 4-month sample within 11-days of the post coaching feedback session to complete the study (two were junior physiotherapists who were on a 'rotational' contract and were about to leave to join another department, and another exercise specialist was leaving to take up a post in a different organisation). The other three participants took considerably longer (up to 22-weeks after they had received feedback on the post-coaching sample).

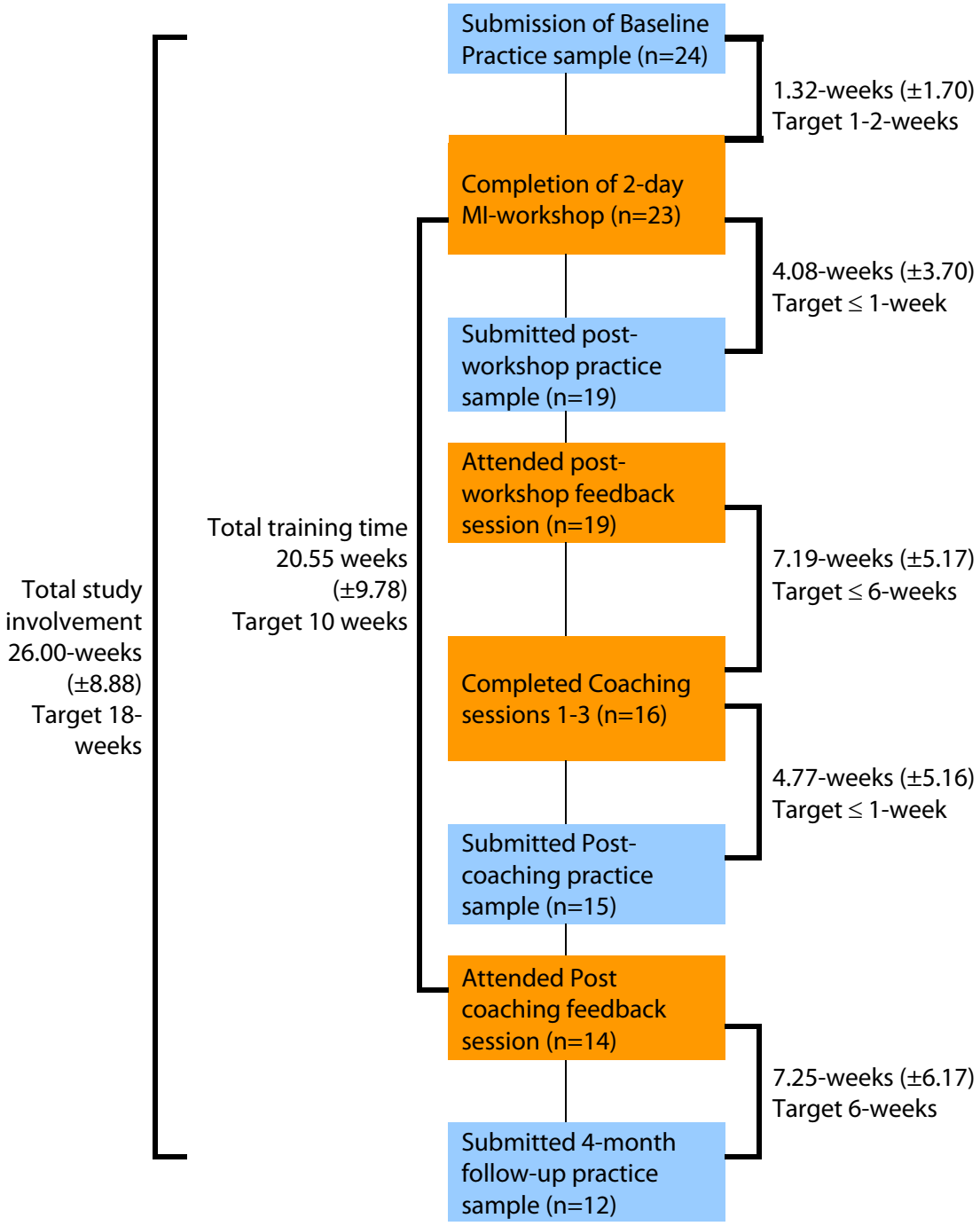


Figure 8-6. Study 2: mean (standard deviation) latency between training and assessment activities for the full sample (n=24).

8.4.3 **Baseline practice**

Prior to MI training, all 24 participants submitted an audio-recording of an intake consultation reflecting their normal way of working to promote engagement with PR and or increase patients' motivation for physical activity. According to the decision rules presented in section

8.3.4.4.2.3 (page 201) the mean time discussing such issues was 12 minutes 39 seconds ±5'03" (range 5'46" – 25'15"). Most commonly this involved reviewing the reasons for referral with a specific emphasis on the problems that the patient had been experiencing, describing the content and benefits of PR and exploring the practical issues of timing and transport to the programme. The results of the MITI analysis are presented in Table 8-3.

Table 8-3 *Baseline Motivational Interviewing Treatment Integrity (MITI) Scores for Entire Sample (n=24)*

MITI Variable	Mean	SD	Min	Max
Global ratings (1-5 Likert scale)				
Evocation	1.50	0.59	1	3
Collaboration	2.00	0.66	1	3
Autonomy support	3.00	0.64	1	3
Direction	3.71	1.00	1	5
Empathy	2.04	0.91	1	4
MI spirit[a]	2.11	0.45	1.67	3.33
Mean global rating[b]	2.42	0.48	1.60	3.60
Scores based on behaviour counts				
Percent open questions	15.88	13.17	0	50
Reflection question ratio	0.35	0.47	0	2.25
Percent complex reflections	2.38	6.54	0	29
MI-adherent count	0.33	0.64	0	2
MI-non adherent count	2.46	2.04	0	7
Percent MI-adherent	11.14	20.52	0	67

Note. SD = standard deviation; Min = minimum score obtained; Max = maximum score obtained. [a]Average of evocation, collaboration and autonomy support global ratings. [b]Average of evocation, collaboration, autonomy support, direction and empathy global ratings.

Baseline samples averaged 2.46 (±2.04) MI-non adherent behaviours per consultation, triggered predominantly by the provision of unsolicited education and/or advice. There was no evidence of other MI non-adherent behaviours that are more threatening to patient autonomy, such as confronting the patient about the need for change or forcing patients to join PR. MI-adherent behaviours (those that are consistent with the style and practice of MI such as asking permission

before providing information and reinforcing patient autonomy and choice) were less common, averaging 0.33 (±0.64) per session.

The mean global rating for evocation was 1.5 (±0.59) reflecting a reliance on advice giving at the expense of eliciting the patients' thoughts about PR and how the benefits may be linked to their interests, values and aspirations. There was little reinforcement or development of change talk when it emerged.

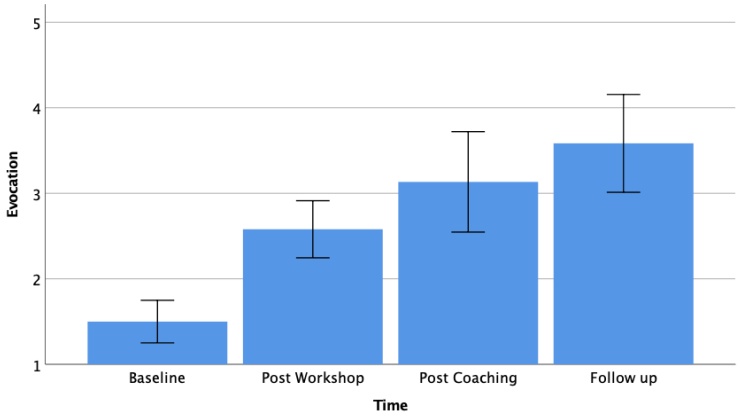
The mean rating for collaboration was 2.00 (±0.66) indicating a tendency for participants to assume an expert role rather than involving patients by placing their ideas at the centre of the discussion. This is illustrated by the relative balance of micro-skills employed. Closed, fact-finding questions (for example about patients' availability for PR) were more common than open-ended questions enquiring about patients' thoughts and feelings about the programme (percent open questions; mean 15.88 ±13.17). The ratio of reflective listening statements to questions was 0.35 (±0.47) demonstrating a reliance on questions at the expense of empathic reflective listening statements. Mean percent complex reflections was 2.38 (±5.64) indicating a tendency to base reflections on the explicit content of what patients said rather than the unspoken meaning. The relative frequency and depth of reflective listening helps to explain the low empathy score (mean 2.04 ±0.91).

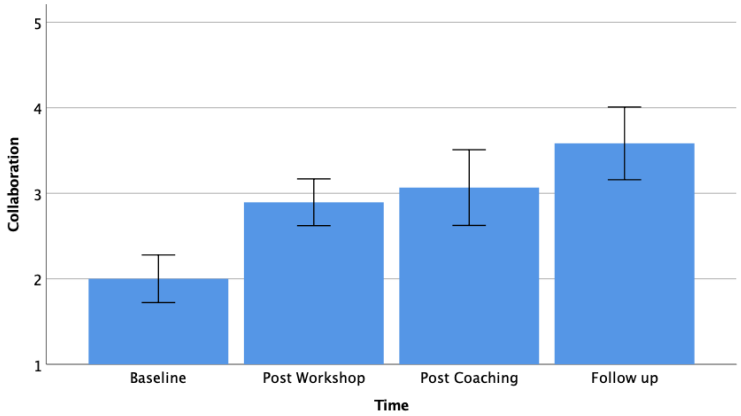
The mean rating for autonomy support was 3.00 (±0.64). Patients' readiness to engage with the programme was often assumed based on attendance for the intake appointment despite patients stating they were unclear as to why they had been referred for PR and what the programme involved. Furthermore, there was little evidence of actively working to develop patients' sense of control and choice about joining the programme.

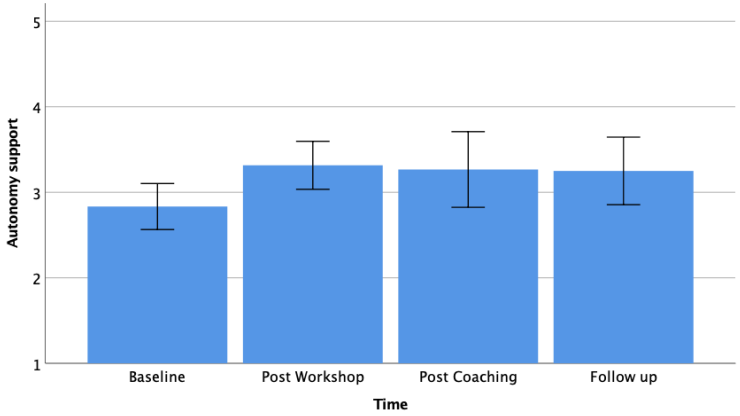
The mean global rating for direction was 3.71 (±1.00) which reflects participants' success in keeping the conversation focused on PR engagement and physical activity. Exceptions were consultations involving patients with complicated histories where the conversation commonly dwelled on the history of the problem without the participant attempting to redirect the conversation to possible change.

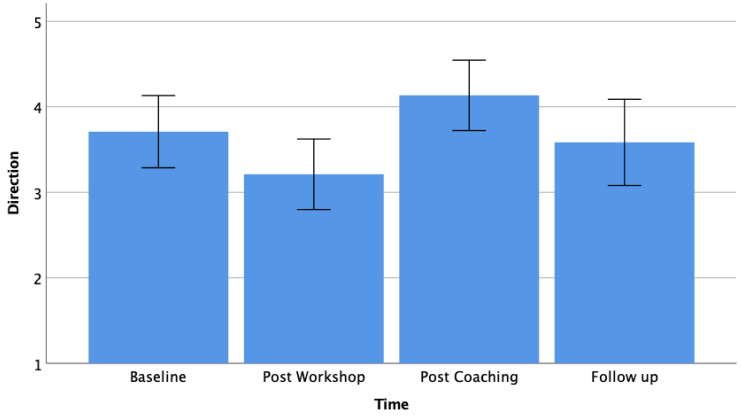
8.4.4 **Time effects for entire sample**

The changes in MITI outcomes following each stage of training are reported in this section. The graphs in Figure 8-7 (page 214) show the mean values observed at all assessment points for each of the global ratings and behaviour count summary scores.


Evocation
5
4
3
2
1
Baseline
Post Workshop
Post Coaching
Follow up
Time


Collaboration
5
4
3
2
1
Baseline
Post Workshop
Post Coaching
Follow up
Time


Autonomy support
5
4
3
2
1
Baseline
Post Workshop
Post Coaching
Follow up
Time


Direction
5
4
3
2
1
Baseline
Post Workshop
Post Coaching
Follow up
Time

Empathy
5
4
3
2
1
Baseline
Post Workshop
Post Coaching
Follow up
Time

MI spirit
5
4
3
2
1
Baseline
Post Workshop
Post Coaching
Follow up
Time

Mean global rating
5
4
3
2
1
Baseline
Post Workshop
Post Coaching
Follow up
Time

Percent open questions
60
50
40
30
20
10
0
Baseline
Post Workshop
Post Coaching
Follow up
Time

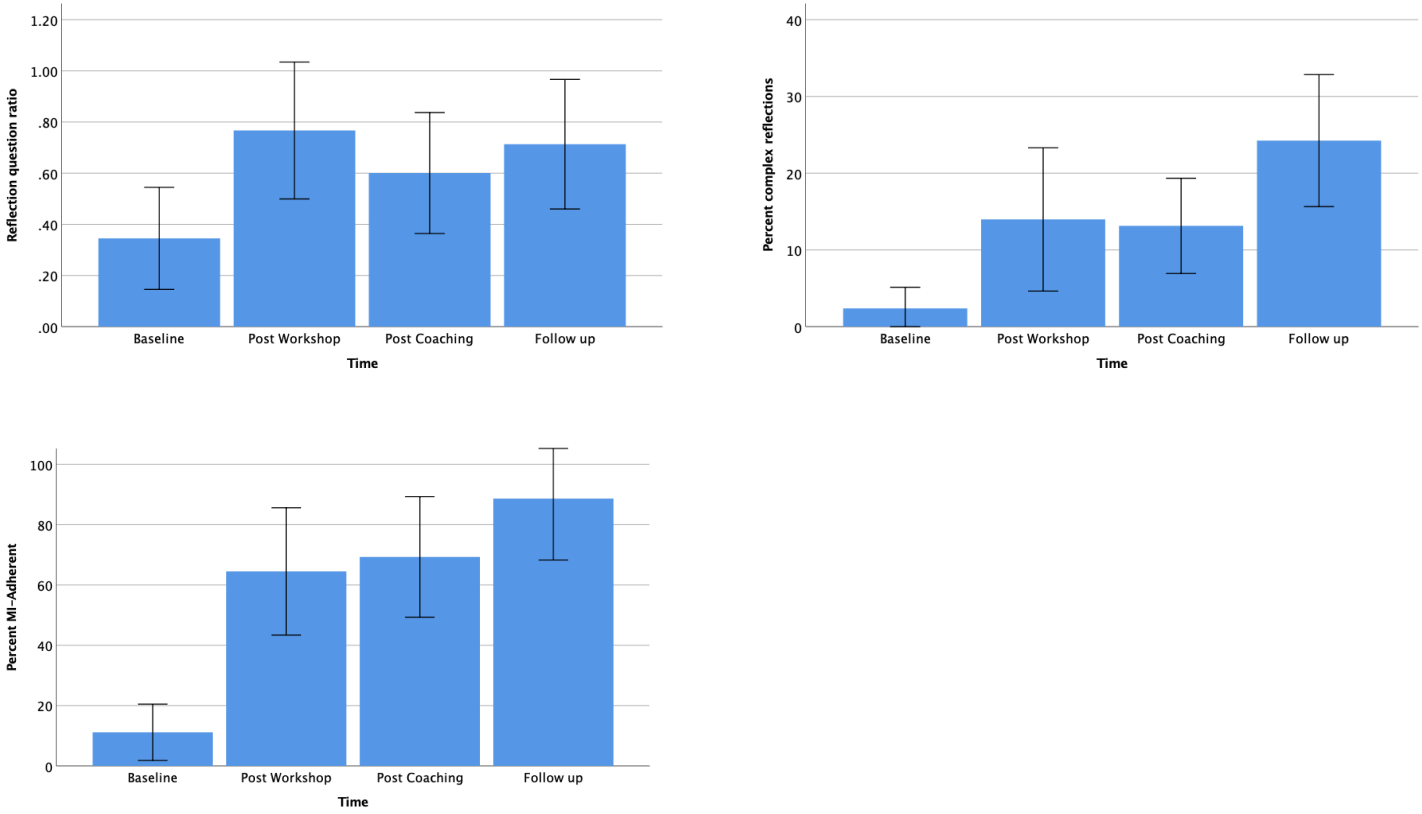


Figure 8-7. Mean motivational interviewing (MI) skill at baseline, post-workshop, post-coaching and 4-month follow-up.
Note. Error bars = 95% confidence intervals.

Outcomes for evocation, collaboration, autonomy support, direction, empathy, MI spirit, mean global rating and percent open question conformed to the assumption of the fixed effect linear mixed model analysis, which is that the distribution of scores and the model residuals is symmetrical with most in the middle. The estimates of fixed effects for each of these variables (controlling for the baseline value and possible differences in the covariates: time registered as a health professional and duration involved in delivering PR) are presented in Table 8-4 (page216). Profession type was included in the original analysis as a covariate (excluding the exercise specialist and physiotherapy technician as there were too few of these) but this was not predictive of outcome, so the analyses were rerun without it. Adjusted means for each timepoint together with pairwise comparisons are presented in Appendix M (page 425). The comparisons were first performed using the baseline value as the reference point and show whether post-workshop, post-coaching, and 4-month follow-up values differ from those obtained pre-training. The analysis was re-run using the 4-month follow-up as the reference point to determine whether these values differed from post-workshop and post-coaching skill levels.

The results indicate that the mean rating for evocation at post-workshop, post-coaching and the 4-month follow-up are all higher than the mean at baseline (by 1.02, 1.58 and 1.89 respectively; all $p < .05$). The variables collaboration, empathy, MI spirit, the mean of the global ratings and percent open-ended questions show a similar pattern of improvement in that scores obtained at the post-workshop, post coaching and 4-month follow-ups were all higher than the baseline value. The graphs in Figure 8-7 (page 214) suggest incremental improvements in these variables, though pairwise comparisons indicate that the numerical differences were not significant.

Outcomes for autonomy support and direction deviate from this pattern. The post-workshop value for autonomy support was significantly greater than that obtained at baseline (by 0.57, $p < .01$), but mean values obtained at the other time-points did not differ. For the direction variable, only the post coaching value exceeded that at baseline (by 0.66, $p = .03$).

Table 8-4 *Study 2 Results of Fixed Effects from Linear Mixed Model Analysis for Motivational Interviewing Treatment Integrity (MITI) Assessed Outcomes*

			95% CI	
Parameter	**Estimate**	**Sig (*p*)**	**Lower bound**	**Upper bound**
Estimates of fixed effects for evocation rating				
Intercept	1.90	< .001	1.52	2.28
4-month follow-up	1.89	< .001	1.22	2.56
Post coaching	1.58	< .001	1.00	2.16
Post workshop	1.02	< .001	0.58	1.45
Baseline	0[a]			
Time as a registered HCP	-0.03	< .01	-0.04	-0.01
Time delivering PR	0.01	.65	-0.05	0.08
Estimates of fixed effects for collaboration rating				
Intercept	2.33	< .001	1.92	2.75
4-month follow-up	1.35	< .001	0.84	1.86
Post coaching	0.99	< .001	0.49	1.49
Post workshop	0.89	< .001	0.57	1.22
Baseline	0[a]			
Time as a registered HCP	-0.03	< .01	-0.05	-0.01
Time delivering PR	0.05	.15	-0.02	0.11
Estimates of fixed effects for autonomy support rating				
Intercept	2.82	< .001	2.40	3.25
4-month follow-up	0.27	.34	-0.31	0.86
Post coaching	0.47	.07	-0.04	0.98
Post workshop	0.57	< .01	0.16	0.98
Baseline	0[a]			
Time as a registered HCP	-0.02	.02	-0.04	0.00
Time delivering PR	0.09	< .01	0.02	0.15
Estimates of fixed effects for direction rating				
Intercept	3.61	< .001	3.07	4.15
4-month follow-up	-0.16	.65	-0.91	0.58
Post coaching	0.66	.03	0.09	1.24
Post workshop	-0.45	.21	-1.15	0.26
Baseline	0[a]			
Time as a registered HCP	-0.02	.06	-0.03	0.00
Time delivering PR	0.08	.02	0.01	0.15

			95% CI	
Parameter	**Estimate**	**Sig**	**Lower bound**	**Upper bound**
Estimates of fixed effects for empathy rating				
Intercept	2.37	< .001	1.89	2.84
4-month follow-up	1.68	< .001	1.10	2.25
Post coaching	1.04	< .001	0.50	1.58
Post workshop	1.07	< .01	0.48	1.65
Baseline	0[a]			
Time as a registered HCP	-0.03	< .01	-0.05	-0.01
Time delivering PR	0.06	.09	-0.01	0.13
Estimates of fixed effects for MI spirit rating				
Intercept	2.35	< .001	2.03	2.66
4-month follow-up	1.20	< .001	0.71	1.69
Post coaching	1.00	< .001	0.60	1.41
Post workshop	0.81	< .001	0.53	1.09
Baseline	0[a]			
Time as a registered HCP	-0.02	< .01	-0.04	-0.01
Time delivering PR	0.03	.19	-0.02	0.08
Estimates of fixed effects for the mean of the global ratings				
Intercept	2.54	< .001	2.24	2.84
4-month follow-up	1.04	< .01	0.54	1.54
Post coaching	0.95	< .001	0.61	1.29
Post workshop	0.64	< .001	0.35	0.94
Baseline	0[a]			
Time as a registered HCP	-0.02	< .001	-0.04	-0.01
Time delivering PR	0.07	< .01	0.03	0.12
Estimates of fixed effects for percent open-ended questions				
Intercept	15.54	< .01	6.79	24.29
4-month follow-up	29.13	< .001	15.83	42.43
Post coaching	20.37	< .001	10.34	30.40
Post workshop	12.95	.01	3.24	22.66
Baseline	0[a]			
Time as a registered HCP	-0.27	.17	-0.65	0.12
Time delivering PR	1.51	.04	0.11	2.91

Note. CI = confidence interval; HCP = health care professional; PR = pulmonary rehabilitation; sig = significance. Linear mixed model analysis was performed on MITI variables where the model residuals are normally distributed. [a]This parameter is set to zero because it is redundant.

The variables reflection question ratio, percent complex reflections and percent MI-adherent were analysed using a Negative Binomial Regression with multilevel because the distribution of scores were positively skewed and produced model residuals that were also positively skewed. The results of these analyses are reported in Table 8-5.

Results for the reflection question ratio indicate that values obtained at the post-workshop, post-coaching and the 4-month follow-ups were 2.1, 1.9 and 2.2 times the size of the baseline value respectively (all *p*s< .05). Results for percent complex reflections and percent MI-adherent behaviours show a similar pattern with all post training values higher than those obtained at baseline (all *p*s< .05).

Table 8-5 *Study 2 Results of Negative Binomial Regression with Multilevel Analysis for Motivational Interviewing Treatment Integrity (MITI) Assessed Outcomes*

				95% CI for Exp (Coefficient)	
Model term	**Coefficient**	**Sig (*p*)**	**Exp (Coefficient)**	**Lower bound**	**Upper bound**
Fixed Coefficients for the reflection question ratio (x100)					
Intercept	3.46	< .001	31.67	18.52	54.16
4-month follow-up	0.79	.03	2.20	1.07	4.56
Post coaching	0.66	< .05	1.94	1.01	3.73
Post workshop	0.73	.02	2.08	1.12	3.86
Baseline	0[a]				
Time as a registered HCP	-0.01	.67	1.00	0.97	1.02
Time delivering PR	0.06	.20	1.06	0.97	1.15
Negative Binomial	0.74				
Fixed Coefficients for percent complex reflections					
Intercept	0.53	0.33	1.70	0.58	4.95
4-month follow-up	2.48	< .001	11.91	3.17	44.72
Post coaching	1.90	.01	6.70	2.01	22.36
Post workshop	1.85	< .01	6.34	2.11	19.07
Baseline	0[a]				
Time as a registered HCP	0.02	.31	1.02	0.98	1.07
Time delivering PR	-0.01	.92	0.99	0.84	1.17
Negative Binomial	3.08				

Model term	Coefficient	Sig	Exp (Coefficient)	95% CI for Exp (Coefficient) Lower bound	Upper bound
Fixed Coefficients for Percent MI-adherent Behaviours					
Intercept	2.65	< .001	14.09	6.59	30.12
4-month follow-up	1.86	< .001	6.41	2.40	17.17
Post coaching	1.76	< .001	5.82	2.34	14.47
Post workshop	1.66	< .01	5.26	2.08	13.28
Baseline	0[a]				
Time as a registered HCP	-0.03	.03	0.97	0.94	1.00
Time delivering PR	0.07	.19	1.08	0.96	1.20
Negative Binomial	2.44				

Note. CI = confidence intervals; Exp = exponential; HCP = health care professional; Sig = significance. Probability distribution is Negative binomial, link function is Log. The Negative Binomial Regression analysis relies on values that are non-negative integers. Therefore, actual values for the reflection question ratio were transformed in SPSS by multiplying by 100.
[a]This coefficient is set to zero because it is redundant.

8.4.5 Completer analysis

MITI scores derived from the baseline and 4-month follow-up practice samples for the 12 study completers are presented in Table 8-6 (page 222). All completers submitted a recording of an intake consultation for the baseline sample. For the 4-month follow-up 11 (92%) recorded an intake consultation and 1 (8%) recorded a follow-up consultation with a patient who had recently completed PR (involving the 'Relapse prevention session'). The amount of time spent discussing issues relating to programme engagement and motivation to increase physical activity increased from 13'17" ±5'32" at baseline (range 7'15" – 25'15") to 15'18" ± 6'10" at the 4-month follow-up (range 8'30" – 26'23").

All MITI scores improved following training with the exception of the global rating for direction. Based on Cohen's classification (Cohen 1992) large effect sizes (≥ 0.8) were observed for measures of evocation, collaboration, empathy, MI spirit, mean global rating, percent open questions, percent complex reflections, MI-adherent count and percent MI-adherent. A medium effect (≥ 0.5 to < 0.8) was detected for MI-non adherent counts and small effects (≥ 0.2 to < 0.5) were found for autonomy support and the reflection question ratio.

The remainder of this section draws on descriptions from the MITI coding manual (Moyers et al. 2010) to explain the changes that occurred in completers' practice following training.

Improvements in the score for collaboration reflect participants' efforts to maximise patient involvement, with their ideas and perspectives influencing the discussion to a greater degree than at baseline. By the 4-month follow-up, participants were more likely to express interest in the patient's perspective on the referral, their thoughts and feelings about PR and how the benefits may align with their health and/or life goals. They were less likely to educate or advise when patients expressed uncertainty or reticence about PR, relying instead on reflective listening to acknowledge understanding and acceptance. An absence of efforts to significantly expand the patient's feelings of control and choice explains the small effect size for autonomy support.

Changes in the relative frequency of MI-adherent and MI-non adherent behaviours also provide evidence of increased attempts to engage patients and reduced clinician dominance. Participants were more likely to ask permission prior to providing information, a skill that shows respect and attracts a MI-adherent code. They were also more likely to provide information in a neutral way rather than as an imperative that the patient must follow. Whilst the number of affirmations increased, there remained a tendency to rely on praise, betraying a capacity for judgment.

Training led to improvements in the use of questions and reflective listening. The relative balance of open-ended questions to closed questions increased, with more evocative questions and fewer fact finding, closed questions evident. The use of reflective listening also increased, which accounted for the increase in the reflection question ratio, though a tendency to respond to what the patient said with further questions rather than empathic reflective listening remained at follow up.

The use of complex reflections (those focused on the underlying meaning of what was said rather than the explicit content) increased relative to baseline. The absolute number of these remained low, however and participants missed many opportunities to deepen the conversation. The changes in reflection question ratio and percent complex reflections contributed to the increased empathy rating.

The global rating for evocation increased following training as participants were more likely to enquire about patients' own motivations to engage with PR rather than provide education and advice. There was clear evidence of participants initiating strategies designed to evoke change talk by using language suggested within the PREAMP manual, however they were less skilled at responding thereafter. A common finding was that opportunities to develop and reinforce

preparatory change talk when it emerged were missed. Furthermore, when patients expressed weak commitment language about joining the programme (for example *"I'll give it a go"*) it was seldom strengthened.

8.4.5.1 Clinical significance analysis

Mean scores achieved by study completers for each MITI component were compared with thresholds for basic competency to determine the clinical significance of the training package. The number reaching each basic competency target was also determined (see Table 8-6, page 222).

Mean scores for empathy, MI spirit, and the average score for global rating surpassed basic competency indicating adherence to the overall style of MI. Eight of the 12 (75%) participants achieved all three targets concurrently. Mean values for the summary scores based on behaviour counts all fell short of basic competency. Most notably, participants struggled to achieve targets for the relative frequency and depth of reflective listening.

Table 8-6 *Motivational Interviewing Treatment Integrity (MITI) Scores at Baseline and 4-month Follow-Up for Study Completers (n=12)*

MITI Variable	Baseline			4-month follow up			Effect size[a]	Basic competency[b]	No. at basic competency
	(mean ± sd)	Min	Max	mean ± sd	Min	Max			
Global ratings (1-5 Likert scale)									
Evocation	1.67 ±0.65	1	3	3.58 ±0.90	2	5	1.55		
Collaboration	1.92 ±0.79	1	3	3.58 ±0.67	2	4	1.69		
Autonomy support	3.00 ±0.74	2	4	3.25±0.62	2	4	0.26		
Direction	3.42 ±1.24	1	5	3.58 ±0.79	2	5	0.12		
Empathy	2.33 ±0.99	1	4	3.83 ±0.72	2	5	1.14	≥ 3.5[c]	10/12
MI spirit[d]	2.20 ±0.55	1.67	3.33	3.50 ±0.61	2.33	4.33	1.60	≥ 3.5	8/12
Mean global rating[e]	2.47 ±0.64	1.60	3.60	3.57 ±0.63	2.22	4.60	1.20	≥ 3.5	8/12
Summary scores based on behaviour counts									
Percent open questions	14.33 ±12.75	0	36.00	46.33 ±15.29	20	71	2.34	≥ 50	6/12
Reflection: Question ratio	0.49 ±0.61	0	2.25	0.71 ±0.40	.28	1.73	0.33	≥ 1	2/12
Percent complex reflections	2.33 ±4.40	0	11	24.25 ±13.54	0	40	1.28	≥ 40	3/12
MI-adherent	0.33 ±0.65	0	2	1.50 ±1.09	0	3	0.83		
MI-non adherent	1.50 ±1.17	0	3	0.33 ±0.89	0	3	0.71		
Percent MI-adherent[f]	13.89 ±22.05	0	50	88.64 ±30.34	0	100	1.37	≥ 90	9/11

Note. sd = standard deviation; MI = motivational interviewing. Study completers completed all training and assessment tasks.
[a]Effect size is Cohen's d. [b]Basic competency refers to the level of MI skill considered sufficient to impact patient outcomes. [c]The MITI 3.1.1 coding system does not specify a threshold for empathy, the basic competency value is based on the same scale from the MITI 4.2 version that combines empathy with partnership global ratings.
[d]Average of evocation, collaboration and autonomy support global ratings. [e]Average of the global ratings for evocation, collaboration and autonomy support, direction and empathy. [f]There were no instances of MI-adherent or MI-non adherent behaviours in one follow-up recording, therefore the denominator for this variable is 11.

8.5 Discussion

8.5.1 Summary of findings

The main aim of the study was to explore the feasibility of MI for clinicians involved in PR. This involved documenting participants' progression through a package of MI training and measuring the impact of training on their MI skills in clinical practice. Overall, the results lend some support to the feasibility of MI for PR clinicians. Training led to improvements in MI skill; by the 4-month follow-up after all the training had been received, study completers achieved basic competency on the average of the global ratings, MI spirit and empathy.

Several issues were highlighted that warrant further exploration. Participant attrition occurred throughout the study and it took longer than anticipated to complete each training component and to submit practice samples. Whilst mean values for the relative frequency and depth of reflective listening improved, they did not reach their respective competency targets. The results indicate a need to determine how best to promote engagement with training, pre-empt attrition and improve skill acquisition.

8.5.2 Progression through training and attrition

It took longer than expected to complete the training package, with the submission of practice samples for assessment and feedback purposes causing the longest delays. Participants gave several reasons for this in response to reminder emails and telephone calls. Most commonly they described difficulties integrating sufficient MI within existing consultations. Whilst service leads agreed that team members could participate, there was no formal agreement to extend consultation duration. One participating organisation was undergoing extensive restructuring at the time of the study. As part of the transition to a revised service, there was a significant decrease in referrals, which reduced the opportunities to practice skills and record consultations. Performance anxiety and concerns about having their skills evaluated were also given as reasons for submission delays. Participants disclosed they would only provide recordings of their best MI practice which implies the MITI scores observed in this study reflect a best-case scenario of the impact of training.

Delays like these are common in MI training studies. For example, Bohman et al. (2013) reported that training (consisting of workshop and follow-up supervision) took nearly twice as long as anticipated (actual time 8.2-months; prescribed time 4.3-months).

That 50% of the sample withdrew prior to completing all study components was surprising given participants were self-selected and had initially expressed enthusiasm about learning MI. In one meta-analysis of MI training studies, Schwalbe et al. (2014) reported that attrition ranged between 0-86% across the 12 studies for which a value could be calculated.[34] Using the same calculation, attrition in the present study equalled the median value in the review (29%). Of note, Schwalbe reported that attrition had a moderating impact on post-workshop MI skills, such that studies with attrition below the median value reported increases in MI skills over a 6-month follow-up (n=7, d = 0.12; 95% CI: = 0.06, 0.18), whereas studies with attrition above the median observed a decay in skills (n=4, d = -0.10; 95% CI: not reported).

In the present study, work related issues and changes in personal circumstances were cited by participants as reasons for their withdrawal, rather than MI not being relevant or helpful to their work. It is recognised that these may constitute socially acceptable responses given to the author to avoid upsetting him and to minimise personal embarrassment (since he also delivered the MI training). One possibility is that those who struggled may have been the least motivated participants who did not share the author's enthusiasm for MI and/or experienced most difficulty acquiring and implementing the skills.

To illustrate, those who withdrew had practiced as a health professional for twice as long as study completers and were more likely to occupy a senior position within their organisation. Results of multilevel modelling indicated that time registered as a health professional was a predictor of outcome for several MITI variables, such that longer period since registration was significantly associated with a lower score at each assessment point (although the size of effect was small). Of note, more senior participants' baseline practice showed greater evidence of behaviours that are inconsistent with the spirit and principles of MI (higher MI-non adherent behaviours and lower empathy combined with higher direction). It may have been that these participants struggled to acquire MI skills because the underlying style of working did not align with the approach they were used to and felt comfortable with and that this undermined their engagement with the training programme. This idea is consistent with findings from other studies that show trainee's skills prior to training predicts how well they fare when learning MI (Baer et al. 2004; Carpenter et al. 2012; Smith et al. 2012b; Moyers and Miller 2013) and the idea that the difficulty of acquiring MI skills may increase with years of experience with methods that are conceptually opposed to MI (Resnicow et al. 2002b; Dunn et al. 2015).

[34] Calculated as the total possible number of post-workshop training inputs divided by the actual number received and subtracting this quantity from one (p. 1292).

Given the importance of full and timely completion of training, it was deemed necessary to gain a more comprehensive understanding of participants' training experiences and needs and to do so in a way that was less vulnerable to social desirability bias. To that end, study 3 (trainee experiences) employed a researcher who was independent of the training in study 2 to explore these issues using semi-structured interviews. The results of the analysis of these interviews are reported in section 9.4 (page 248) and the issue of engagement with training discussed in section 9.5.3.2 (page 291).

8.5.3 Motivational interviewing skill development

Using MI represented a substantial change for these clinicians in terms of the focus, skills used and the philosophy underlying practice. Prior to training, PR consultations had a medical emphasis,[35] with readiness to engage with the programme often assumed based on patients' attendance for the intake appointment. Where ambivalence was met, it was typically countered with education and advice about the benefits of the programme rather than being explored fully in an autonomy respecting, empathic atmosphere. Moreover, patients were seldom given the opportunity to clarify how the benefits of the programme align with their values, goals and current health concerns. These findings are consistent with the ideas presented within logic model of the problem of sub-optimal engagement with PR presented in Figure 7-2 (page 175).

The training package led to improvements in most MITI outcomes, which were well maintained at follow-up. A surprising finding was that coaching and feedback did not result in additional skill gains beyond those observed immediately after workshop training. It was anticipated that significant differences would be observed between the post-workshop and post-coaching samples after participants had received feedback on their post-workshop sample and completed three coaching sessions. Although the estimates of fixed effects showed numerical increases beyond the post-workshop assessment, attrition meant that fewer participants contributed to later follow-ups (post-workshop n=19; post coaching n=15, 4-month follow-up n=12) and this may have explained why there was no significant additive effect.

The only MITI components that did not show an overall improvement between baseline and 4-month follow-up were autonomy support and direction. Baseline values for these two variables were the highest of the global ratings, however (adjusted mean autonomy support 2.85, 95% CI: 2.51, 3.18; direction 3.66, 95% CI: 3.19, 4.14), leaving less room for improvement relative to other elements of practice. The lack of change in autonomy support may reflect difficulties balancing

[35] This was evident in those audio-recordings that captured the entire consultation. Some participants recorded only those elements relating to PR engagement and motivation, therefore it was not possible to determine the relative balance of activities from those practice samples.

this with the ethical principle of beneficence. As others have reported, clinicians used to providing expert advice and education sometimes have difficulty allowing patients greater freedom to decide for themselves what is best (Pill et al. 1999; Mudge et al. 2015). Fears over patients choosing a course of action that is not in their best health interests can challenge fundamental attitudes and beliefs regarding the extent of a clinician's professional responsibility. This implies that it may take more time and training to promote the cognitive shift required to alter this element of practice.

One possible explanation for the temporary decrease in ratings of direction observed immediately following workshop training relates to participants' attempts to become more patient-centred. This was particularly apparent in practice samples when the conversation digressed or there was an excessive focus on the patient's symptoms and activity limitations. In their attempt to show empathy and avoid dominance, participants often missed opportunities to direct the conversation toward behaviour change.

8.5.4 **Clinical significance**

By the 4-month follow-up participants had completed all training components and therefore this assessment point was used to evaluate the clinical significance of the training package. It is recognised that this analysis is biased in that study completers are likely to represent the most motivated subset of participants who encountered the fewest problems learning MI and integrating the skills in practice. The results may therefore represent a best-case scenario with regard to the impact of training.

The achievement of basic competency in the elements of practice that relate to the overall style of MI was encouraging. As Miller and Moyers (2007) argue, embracing the underlying spirit is an important starting point in learning MI and is a good predictor of the extent to which clinicians will develop proficiency in the method overall. The beneficial effects of the training is also reflected in the broad achievement of three objectives for the proposed MI engagement session (see Table 7-1, page 180) specifically: for the patient to feel listened to and understood; to communicate an understanding of the patient's perspective regarding their health situation; and to help the patient see how the potential benefits of PR align with their values, goals and current health concerns.

Given MI's complexity and the brevity of the training package, it was unsurprising that participants struggled in some areas. The most notable shortcomings in MITI assessed skills were the relative frequency and depth of reflective listening. Whilst both elements increased, baseline values were low, and the magnitude of change was insufficient to raise levels to basic competency. None of the 12 samples provided by study completers achieved basic competency

in each of the five key elements of MI practice that have most consistently been linked to patient outcomes: MI spirit, empathy, percent MI-adherent behaviours, ratio of reflective listening statements to questions and percent complex reflections.

The clinical significance analysis involved comparisons with arbitrary targets based on expert opinion and as such the results should be viewed with caution. The nature of the relationship between MI skill and behaviour change outcomes in COPD has not been established (assuming one exists) and it is not known whether there are particular skills that are more important than others and what minimal skill level is required. Moreover, the majority of research focused on mechanisms of action (upon which opinions about competency targets are largely based) has evaluated the use of MI as a standalone intervention. Much less is known about how it works when used in combination with other treatments such as PR.

In the absence of empirically derived competency thresholds, it has been recommended that MITI scores are considered together with other outcomes such as patient language to support judgments about the adequacy of clinician skill (Moyers et al. 2010; Moyers et al. 2016b). It was beyond the scope of this research to formally evaluate patient language, but the author's impressions formed whilst analysing recorded sessions with the MITI are relevant and are discussed below.

The technical hypothesis of MI suggests that MI may work through the differential reinforcement of client change talk and the softening of sustain talk (see section 3.9.1, page 47). Follow-up samples showed evidence of preparatory change talk (verbalised desire, ability, reason and need for change) as patients were encouraged to think about how the benefits of PR align with their own health and treatment aspirations. For example, they predicted that improved exercise tolerance would enable them to engage in more social activities and make everyday tasks easier. Opportunities to develop and reinforce the change talk were missed though, which meant it remained poorly elaborated and did not show the pattern that is predictive of change in MI.

Difficulties achieving the required depth of conversation meant that practice typically fell short of meeting two key objectives for the MI engagement session: to facilitate exploration and resolution of ambivalence about joining the programme; and to problem-solve practical and psychological barriers to engagement. The relatively weak commitment language that emerged towards the end of follow-up consultations (for example *"I'll give it a go"*) implies that ambivalence about starting PR had not been adequately resolved. This idea is supported by the observation that the trajectory of sustain talk did not seem to change over the course of the

conversation. For example, when discussing a typical day,[36] several patients disclosed that their breathlessness (and fear of it) limited their daily activities and prevented them from exercising. Yet there was little evidence of this being discussed subsequently in the context of joining PR and no sign of a shift in attitudes and beliefs about their breathing that would indicate increased readiness to become more active.

This shortfall raises questions about the extent to which patients' agreement to join the programme was driven by a wish to conform to what they thought was expected of them, rather than a product of having considered their situation in depth and their ambivalence having been resolved (that is in keeping with the conflict resolution hypothesis described in section 3.9.3, page 51). It can be challenging to achieve this depth of conversation as patients often feel uncomfortable raising concerns about changing behaviour over fears of negative judgment and concerns about being controlled by the clinician. Moreover, some patients actively avoid discussions that involve confronting fears of breathlessness to protect themselves from unpleasant emotions. It may require skill levels beyond those demonstrated by participants to create the conditions of support that encourage patients to reveal their true thoughts and feelings, work through their ambivalence about joining the programme and develop stronger, more self-determined reasons to become more active. Results of the MITI analysis indicate that conveying acceptance of the patient as they are through non-judgmental reflective listening and working to expand patients' sense of autonomy and control are important development needs that would be helpful in this regard.

8.5.5 Comparison of motivational interviewing skill development with the existing literature

The improvement in MI skill, particularly amongst study completers was encouraging. Improvements in both MI spirit and empathy in the present study were large according to Cohen's classification (Cohen 1992) (effect sizes 1.60 and 1.14 respectively), which parallel the combined effect sizes reported by de Roten et al. (2013) in the meta-analyses of MI training across problem domains (MI spirit 1.05; 95% CI: 0.65, 1.44; empathy 1.02; 95% CI: 0.76, 1.28).

Comparison of the level of MI skill achieved with other studies involving health professionals reveals a mixed picture. The results here are more favourable than those observed in studies

[36] The typical day strategy is used early in an MI session with the primary aim of building rapport. It provides an opportunity for the patient to discuss their current physical activity (including any activity avoidance) within a non-pathological framework. Key skills involve taking an active interest in the patient's perspective about their current situation and demonstrating acceptance, by responding with non-judgmental reflective listening and reinforcing the patient's autonomy and choice, thereby fostering engagement.

involving a lower volume of follow-up supervision. For example Broekhuizen et al. (2012) used a 3-day workshop to train a lifestyle coach and a nurse to use MI to target physical activity, diet and smoking in a trial involving people with familial hypercholesterolemia. Mean MITI global ratings of trial sessions were lower than the post training values observed here (empathy 2.9; MI spirit 2.7; direction 3.3) as were the percent open questions (21%) and percent MI-adherent values (83%). Only the reflection question ratio (1.03) and percent complex reflections (39%) were higher. Similarly, Jelsma et al. (2017) trained lifestyle coaches from various backgrounds to deliver a gestational diabetes prevention intervention focused on healthy eating and found little evidence of basic competency in MI during trial sessions. A key difference was that clinicians in the present study received individualised coaching and feedback following the initial training, whereas those in received a follow-up group workshop. The amount of supervision received has consistently been linked to better outcomes in MI training (Miller et al. 2004; Barwick et al. 2012; de Roten et al. 2013; Schwalbe et al. 2014).

Several authors have reported post-training MITI scores that were higher than those observed here (Forsberg et al. 2010; El-Mallakh et al. 2012; Smith et al. 2012a; Benzo et al. 2013; Wilson et al. 2018). These studies typically involved a higher volume of MI training than in the present study, up to 84-hours supervision in one (Forsberg et al. 2010). They also differ on the extent to which MI was the focus of the consultation. For example Smith et al. (2012a) reported superior treatment integrity scores within a trial involving patients with multiple sclerosis who received three, 30-60 minute MI sessions dedicated to encouraging adherence to a structured exercise programme. Percent MI-adherent speech (95%), percent complex reflections (40%) and percent open questions (57%) all surpassed basic competency and values for MI spirit (4.3) and ratio of reflections to questions (2.6) achieved the higher proficiency (expert) target. By contrast, for assessment purposes at least, most participants in the present study attempted to deliver MI within the intake appointment that patients attend following referral for PR.[37] Within this

[37] Participants were taught to use MI within several types of consultation that occurred before, during and after PR (see Table 7-1) and could choose which type to record and submit for evaluation. Two of these appointments were designed to be short sessions that were dedicated to MI and were particularly suited to delivery as a standalone session. There were several reasons why the majority of participants elected to record the intake consultation for assessment purposes despite it being a more challenging context to apply MI skills. Firstly, much of the workshop training focused on this application. Secondly, in some Trusts there were limited opportunities beyond the initial appointment to discuss programme engagement and adherence issues on a one-to-one basis. Within those Trusts where an additional support consultation was feasible, for practical reasons (given one of its aims was to address poor attendance) this session was most commonly delivered by telephone, which without appropriate equipment was not possible to record. An unanswered question is whether MITI scores would differ as a function of the type of appointment in which MI was used. If the purity of MI is important, then it would be expected that integrity would be higher in the dedicated MI consultations. Of note, many of the coaching sessions delivered as part of the training focused on 'Strengthening motivation', 'Support' and 'Post PR relapse prevention' sessions and so perceptions of acceptability and feasibility of all sessions are based on insights gathered about all types of session within the process flow.

appointment clinicians typically gather medical information, perform assessments of exercise tolerance and lung function, observe inhaler technique and provide education. This is a particularly demanding context to use MI since these tasks have a different focus, emphasise different skills and importantly place the clinician in an authoritarian role. Several participants described having difficulties relinquishing the expert role and transitioning to MI's collaborative, evocative style, particularly in time limited appointments. This may explain why some of the key elements of MI practice such as the frequency and depth of reflective listening remained below basic competency.

The difficulty of transitioning between MI and tasks involving a different communication style has been observed in other studies within health contexts where similar consultation designs have been employed (Bohman et al. 2013; Channon et al. 2016; Magill et al. 2018b). That it has also been reported in studies involving highly trained therapists with counselling backgrounds who are well disposed to delivering psychologically informed interventions (Simpson et al. 2010; Moyers and Houck 2011) reinforces how challenging it is to integrate MI with other approaches. It underscores the need to carefully consider the context in which MI is implemented. Offering a separate appointment following referral that is dedicated to addressing programme engagement would potentially reduce the demand for clinician skill, though the cost-effectiveness of this would require investigation. It also implies the need to teach clinicians when and how to transition between different elements within a consultation and to include that information in any manual that is used to guide implementation efforts.

8.5.6 **The challenge of using motivational interviewing in practice**

MITI scores reflect both MI skill and a clinician's ability to adhere to the spirit and principles in practice. The assumption that participants would have sufficient time to integrate MI within their routine practice turned out to be an oversight. Although service leads were supportive of team members' involvement, participants were having to integrate MI into existing programme structures without agreement to extend contact time. This made it difficult to achieve the depth of conversation required particularly at the early stage of learning whilst skills were inefficient. Working in a time limited environment also interfered with clinicians' ability to listen deeply to their patients and might explain why some chose the audio-record the last consultation of a clinic for assessment purposes (or an appointment when there was no immediate consequence of running over) to give them the best chance of evidencing their MI skills. This finding is consistent with the work of (Lundell et al. 2017) who reported that the design of healthcare services can undermine the delivery of effective care for patients with COPD.

Another challenge encountered by participants was encouraging patients to take an active role in conversations. Patients' recall of their referral for PR typically involved being told or advised to attend without their views having been solicited. These types of interaction shape patients' expectations for their role in future encounters as being passive recipients of information and advice (Eliassen 2016). MI invites patients to think hard about their situation, share their own ideas about change and assume more control in decision making than they expect or are used to. Evidence from recorded consultations, together with participant feedback during supervision indicate that some patients found this difficult or were reluctant to assume this 'new' responsibility.

8.5.7 Strengths and limitations

8.5.7.1 Sample

A strength of the study relates to the diverse nature of the sample. Participants were recruited from five NHS organisations with hospital and community-based programmes and different PR structures (rolling and cohort) represented. The external validity was further supported through involvement of participants from each professional group that is traditionally involved in PR delivery with differing levels of experience and seniority. It is recognised that participating clinicians were self-selected and apparently well motivated to learn MI. Moreover, they were working within an organisation whose service lead had been sufficiently interested in the potential of MI to agree to being involved and to support willing team members. In this sense it is unclear to what extent these results would translate to all PR clinicians.

Due to the small number of participants within four of the cohorts, it was necessary to involve other clinicians in the group workshop (some of whom did not have a PR background) to make this element of the training package viable. Whilst it is possible that their attendance detracted from the learning experiences of study participants, this seems unlikely. A large proportion of the workshop was experiential and drew on the use of real-plays (see Table 7-2, page 184) and skill building exercises with no requirement for PR specific knowledge. Whilst study participants practiced the application of MI principles and skills in the context of PR (that is within the proposed 'Engagement', 'Strengthening motivation', 'Support' and 'Relapse prevention' sessions), the non-PR clinicians used the time to talk with each other about potential applications to their own clinical contexts, which did not detract from the support provided to study participants by the facilitator. Moreover, the workshop was only one element of the training package. Other important components involved ongoing individualised feedback and coaching, which only study participants received.

As a small scale, unfunded study, all MI training was delivered by the author. Utilising only one trainer undermines the generalisability of the findings since the effectiveness of training may differ across providers on the basis of their facilitation skills. Trainer-trainee interaction effects might also influence skill acquisition. In ideal circumstances, this task would have been fulfilled by several trainers to increase external validity.

8.5.7.2 Measurement of motivational interviewing skill

The author completed both the MI training and the coding of practice samples for the assessment of outcome, which raises the potential for measurement bias. One possibility is that in the service of showing the effects of training in a positive light, the results of the MITI analysis could have been inflated. Ideally, these tasks would have been completed independently. In studies employing the MITI coding instrument it is normal practice to have an independent coder who is blind to the study design, double-code a random sample of recordings (most often 10-20%) from each assessment point to prevent drift in the integrity of coding and to document inter-rater reliability (Bellg et al. 2004; Miller and Rollnick 2014). Most commonly, intraclass correlations (Shrout and Fleiss 1979) are used to calculate coder reliability, with Cicchetti (1994) standards of agreement used for comparison purposes. Were this to have been undertaken in the current study, a higher proportion would be required given the smaller sample size. This was not feasible, however, as the study was unfunded.

Several limitations exist in the use of the MITI as a measure of MI skill. Moyers et al. (2005) have acknowledged that the MITI does not capture all the elements of MI practice that are known to influence patient outcomes, in part because coding is restricted to overt clinician behaviour. Although these 'basic' skills can account for as much as 70% of the variance in client engagement (Moyers et al. 2005b), much of what characterises advanced practice relates to a clinician's underlying strategy, for example arranging the conversation in a way that encourages the exploration of ambivalence. These elements are not captured by the MITI because this would involve making inferences about the clinician's intent which could undermine reliability. It has been argued that this means the MITI is best suited for measuring basic competency in MI (Moyers et al. 2005a).

Since study 2 was conceived, an updated version of the MITI (4.2.1) has been developed which reflects advances in understanding of the mechanisms of action of MI (Moyers et al. 2015; Moyers et al. 2016b). For example, two additional global ratings capturing clinicians' efforts to shape the trajectory of client change talk and sustain talk have been introduced. To some degree this addresses the aforementioned limitations of the MITI 3.1.1. regarding clinician strategy. The MITI 4.2.1 also measures the skill of information sharing in a more nuanced way,

which is particularly relevant to healthcare encounters where providing expert advice forms a large element of practice.

Many of the practice samples submitted for evaluation involved consultations in which participants were attempting to integrate MI alongside other clinical tasks. Analysis of these sessions necessitated the development of decision rules regarding which elements of the consultation to code, since a random portion may include inappropriate aspects such as an exercise test. Whilst this approach to analysis is consistent with recommendations by the developers of the MITI (Moyers and Houck 2014; Moyers et al. 2016b), it is acknowledged that deriving a gestalt impression for global ratings from non-continuous elements of a recording is challenging, and may have made the scores less reliable. It is also acknowledged that the decision rules may have artificially inflated MITI global ratings of direction. Instances where the participant failed to direct the conversation back to the target behaviour when the conversation wandered would ordinarily lower the direction rating. In light of the decision rules to code only elements relating to programme engagement and physical activity, such digressions would not have influenced the rating.

In most circumstances, the MI portion of each practice sample contained less than 20-minutes of MI (all of which was coded). The majority contained at least 10-minutes of MI, which is consistent with the validation studies (see Appendix K.3, page 396) and requirements stated in MITI guidance. Ten baseline and one follow-up sample contained less than 10-minutes, which Moyers et al. (2015) have highlighted can make global ratings more challenging. None of these contained less than 5-minutes though, which is the duration below which Moyers et al. (2015) recommend only coding with behaviour counts.

8.5.7.3 Collection of practice samples

The use of recordings of actual practice to derive measurements of MI skill was both a strength and a limitation. This approach yields a more ecologically valid measure of MI practice relative to simulated consultations and provided useful insights regarding the nature of ambivalence in COPD, which was helpful for optimising training (see section 7.2.3.2, page 181). However, securing practice samples involved considerable effort from the author and participants alike, and delays undermined progression through the training package. Were MI to be adopted in routine practice, clinician training might usefully involve standardised patients to provide the basis of feedback as part of ongoing supervision, given this approach pre-empts the practical issues that influenced submission rates.

Another limitation relates to participants' awareness of the study demand characteristics. At baseline, they were asked to record a consultation that captures the way they normally talk to

patients about PR. They were, however, aware of the study's focus on motivating patients to engage with PR, which may have prompted them to change their practice. If this were the case, it could have led to an underestimation of the effects of the MI training package.

It should also be noted that the MI integrity scores derived from practice samples are a product of clinician ability and adherence in practice. It is not clear therefore, whether the sub-optimal MITI scores observed were the result of skill deficits or difficulties integrating the skills within a challenging clinical environment (for example within consultations where multiple tasks compete for limited contact time). The use of simulated consultations for future training studies in which participants demonstrate their skills with actors who role-play standardised patients, without normal pressures of clinical practice, may have helped to elucidate where the difficulties lay.

For each follow-up sample, participants could select which patient session to submit for analysis. Some described having avoided recording consultations that they anticipated would be challenging, for example where the referral letter had indicated the patient had a complicated history or because the patient seemed reticent about joining PR. Two recordings were withheld by participants, which they considered did not reflect their true capability. This was regrettable given that the patients whose consultation had been recorded had completed the consent process. The author acknowledges the associated ethical issues. However, it is the clinicians who were the participants in this research and the author's primary ethical responsibility was to them. As such, participants were entitled to withdraw recordings at any point without penalty, despite having previously given their consent for them to be used. The author was obliged to respect the wishes of the clinician participant not to use the recordings. Participants' accounts of the specific element of the consultation that made it particularly challenging were discussed and worked through during coaching.

Given the choice afforded to participants with regard to the patient session they could submit for evaluation, MITI scores most likely reflect the best case-scenario regarding MI skill acquisition. As others have found, clinicians' use of MI skills following training varies across treatment sessions, with the clinician, client and clinician-client interaction effects potentially influencing MI skill and adherence (Imel et al. 2011; Imel et al. 2014; Dunn et al. 2016). In studies involving several MI providers, the within-provider variability has been found to be greater than the between-provider variability (Dunn et al. 2016) and in small scale studies it has been argued that multiple observations of MI practice at each time point are required to achieve reliable estimates of skill and adherence (Imel et al. 2011; Imel et al. 2014; Dunn et al. 2016). Moreover, it has been recommended that assessments of MI integrity within a clinical trial should involve the

recording of all intervention sessions with a random subset coded, so providers are unaware which sessions will be analysed (Miller and Rollnick 2014).

In study 2, the choice afforded to participants in the type of MI session they could submit for assessment purposes resulted in a sample biased toward the 'Engagement' session. This was not problematic in the context of study 2 research questions since the specific target of the consultation (programme engagement or adherence to unsupervised physical activity recommendations) is largely irrelevant to feasibility questions relating to the impact of training on MI skill development, which were the primary focus. As described above and discussed in section 10.4 (page 319), however, in the service of documenting and reporting treatment fidelity in a future trial, it would be necessary to assess adherence to MI principles and practice across all types of MI-session.

8.5.8 Implications for study 3: Trainee experiences and insights

Whilst overall, this study lends some support for the feasibility of training, it highlighted several personal, service and programme related issues that influenced the speed and extent to which participants completed training, their MI skill development and adherence to the spirit and principles of MI in clinical practice. A follow-up study employing a qualitative design (study 3: trainee experiences) was conceived to explore participants' perspective on these issues. Studies 2 and 3 therefore combined to form a mixed-methods project with an explanatory sequential design (see section 5.4.2.2, page 134).

The author's insights in his capacity as a researcher and as the person responsible for the delivery of training in study 2 (learning MI) are summarised in Table 8-7 (page 236). These were integrated with participants' views from study 3 (trainee experiences) and expanded upon within the discussion section of that study (section 9.5, page 286).

Table 8-7 *Study 2: Issues Identified with the Development of Motivational Interviewing (MI) Skill*

Issue warranting exploration in study 3	Key insights from study 2[a]
Difficulty achieving appropriate frequency and depth of reflective listening	Clinicians struggled to consider what patient is saying and meaning and construct a reflective listening statement in the moment. Clinician's attentional resource is focused on the strategy and their own behaviour rather than what the patient is saying, meaning and feeling. Time limitations and other distractions undermined attempts to listen deeply.
Difficulty achieving appropriate depth of exploration of the patient's ambivalence	Clinicians struggled to conceptualise the patient's ambivalence efficiently; organise the conversation in a way that leads to exploration of ambivalence; respond contingently to what the patient said and differentially reinforcing change talk. Mechanistic application of strategies outlined in PREAMP manual. MI not yet guided by underpinning principles. Attitudes, beliefs and assumptions (particularly about patients raising and exploring emotive subjects) undermined the depth of discussion.
Difficulty applying MI within existing consultation structures	Clinicians required additional consultation time to use, MI particularly whilst skills are novel and inefficient. Integrating MI within consultations involving multiple clinical tasks was particularly challenging.
Delays in completion of training activities	Rate limiting factor seems to be securing/submitting practice samples for evaluation and training feedback purposes. Momentum in learning is undermined by higher than expected latency between supervision meetings. Additional protected time is needed to complete supervision sessions and additional learning (preparation for MI-based consultations, reflecting on practice). Performance anxiety and concerns about submitting practice samples for analysis caused delays (need to get the 'right' patient).
Higher than expected participant withdrawal	Clinicians who had been registered as a Health Care Professional for longer and those whose baseline practice was most out of keeping with the spirit of MI were most likely to withdraw prior to completing all training/assessment activities.

Note. PREAMP = 'Promoting exercise adherence using motivational interviewing blended with pulmonary rehabilitation' intervention manual developed for the study.
[a]Insights gained through reviewing/coding practice samples and conversations with participants during supervision.

8.6 Conclusion

The findings of study 2 provide overall support for the feasibility of MI as an adjunct to PR to enhance engagement and adherence to physical activity recommendations. The training package was well received and resulted in sustained improvements in most dimensions of MI skill. Training did not alter the relative frequency and depth of reflective listening sufficiently though, which may explain in part why patient language did not show the pattern which is predictive of change in MI. Moreover, service-related issues detracted from participants' abilities to complete training activities and integrate MI into clinical practice. Restricted opportunities to integrate MI into existing consultations also limited the amount of feedback needed for the refinement and optimisation of the MI intervention. A summary of the answers to the research questions that were addressed by study 2 (learning MI) is provided in Table 8-8 (page 238). These results indicate a need to determine how best to support clinicians to progress through MI training and extend its beneficial effects.

Table 8-8 *Study 2: Summary of Research Questions and Answers*

Research question	Answer	Supporting evidence location
Participation		
1) What proportion of NHS organisations approached participated in the research?	5 of 7 (71%)	See section 8.3.2.3 (page 190)
2) What proportion of eligible PR staff employed within participating organisations participated?	24 of 27 (89%)	See section 8.3.2.3 (page 190)
Training completion		
3) What proportion of participants completed each element of the training package?	Workshop – 23/24 (96%) All coaching – 16/24 (67%) All feedback – 14/24 (58%) Submitted 4-month practice sample - 12/24 (50%)	See section 8.4.2 (page 203)
4) What was the latency between training components?	Various Time taken to complete all training components - 20.55 weeks (±9.78).	See section 8.4.2.2 (page 208)
5) What reasons did participants provide for withdrawing?	Work related issues and changes in personal circumstances.	See section 8.4.2 (page 203)
6) What was the relationship between participant baseline characteristics and progression through training?	Non-completers had been registered as a health professional for longer and had more MI-non adherent behaviours in their baseline practice samples relative to completers.	See section 8.4.2.1 (page 206)
Motivational interviewing skill development		
7) What was the impact of the training package on MI skill?	Improvements at follow-up in evocation, collaboration, empathy, MI spirit, mean global rating, percent open-questions, reflection question ratio, percent complex reflections, and percent MI-adherent. No change in autonomy support, or direction.	See section 8.4.4 (page 211)
8) Did the training package lead to basic competency in MI?	Yes, for evocation, collaboration, direction, empathy, MI spirit and mean global ratings but not summary scores based on behaviour counts.	See section 8.4.5.1 (page 221)

Note. MI = motivational interviewing; NHS = National Health Service.

In this chapter the second study in this programme of research was presented. In the next chapter the final study (study 3), designed to explore study 2 participants' training experiences and insights, is presented.

Chapter 9: Study 3 Trainee experiences and insights

9.1 Introduction

The third and final study in the programme of research is presented within this chapter. Participants involved in study 2 encountered several personal, service and programme related issues that influenced the speed and extent to which training activities were completed, skill acquisition and the integration of motivational interviewing (MI) into clinical practice (see summary in Table 8-7, page 236). As the existing package of training and support did not appear to enable all participants to achieve an acceptable level of skill and/or adherence, understanding what may have prevented this was considered important for optimising MI training and integration efforts. Study 3 (trainee experiences) therefore formed the second part of the explanatory sequential mixed methods project described in section 5.4.2.2 (page 134).

9.2 Research aim and questions

The aim of study 3 (trainee experiences) was to explore participant accounts of their MI training experiences to help make sense of study 2 (learning MI) outcomes. Specifically, the research questions were:

1) What were participants' experiences of learning MI and integrating the skills in clinical practice?
2) What areas of training/support were perceived to facilitate and/or hinder MI skill acquisition and adherence in practice?
3) How did personal, service and PR programme issues influence the integration of MI in clinical practice?
4) What factors influenced the rate and extent to which participants progressed through the training package?

9.3 Method

9.3.1 **Design**

A qualitative design involving semi-structured interviews and framework analysis was employed.

A semi-structured interview approach was adopted as it achieves a balance between providing sufficient structure to enable consideration of the issues that arose through study 2 (learning MI) with the flexibility to explore issues raised by participants that were unexpected and different ways of understanding the subject matter. Individual interviews were considered more appropriate than focus groups in part because the study aim was to understand each participant's experience. They were also preferred over focus groups given the potential sensitive nature of material being discussed. It was envisaged that some would be reluctant to reveal difficulties with learning and applying MI particularly in front of other health professionals, some of whom would be colleagues. Moreover, arranging focus groups would have been challenging logistically; participants within each cohort completed training and assessment activities at different times and the three cohorts were geographically disparate.

Framework analysis is a member of a broad family of thematic analysis methods (Gale et al. 2013; Ritchie et al. 2014). It enables important patterns (themes) within the data to be systematically identified and analysed, and in so doing can support the formulation of both "descriptive and/or explanatory conclusions" (Gale et al. 2013 p. 2).

This form of analysis was chosen for several reasons. Firstly, it is a flexible approach with theoretical freedom that is capable of providing answers to the research questions. Specifically, the analytical process serves to generate themes that describe and explain the issues that participants experienced whilst learning and implementing MI through study 2. Secondly, as Gale et al. (2013) note, the framework method allows for in-depth analysis of key constructs across the entire data set, without losing the context within which each participant's view was offered. Finally, the clearly defined processes, with clear linkage between each stage of data analysis serves to maximises the transparency of the process. The processes are recursive, allowing the researcher to move back and forth across the data set to ensure consistency between the themes, data and research objectives (Smith and Firth 2011).

9.3.2 **Procedure**

9.3.2.1 Participants and recruitment

Participants comprising the fourth, fifth and sixth cohorts of study 2 (learning MI) were eligible to participate in study 3 (trainee experiences).[38] Those from cohorts five and six provided

[38] Since between one and 3-years had elapsed since the first three cohorts of participants had completed study 2, the author was concerned that these individuals may have difficulty recalling their experiences and reactions accurately and in sufficient detail to warrant their inclusion in study 3 (trainee experiences). Research and development approvals were therefore not sought from these participants' employing organisations for study 3 and they were not invited to participate.

consent to participate in the study 3 interview at the same time as they consented to join study 2 (the information sheet and consent form related to both studies: see Appendix E.2, page 353). Since the research governance approvals necessary for study 3 were secured after the fourth cohort had commenced study 2 (learning MI), it was necessary to approach the three participants from this cohort to gain consent for the follow-up interview whilst they were undergoing MI training. With prior permission, this was undertaken by the member of the research team responsible for facilitating study 3 interviews - an experienced qualitative researcher who was known to participants via her attendance for the 2-day workshop at this site.

Table 9-1 *Background Information on Eligible Clinicians Who Did Not Participate in Study 3 (n=4)*

	Study 2			
Speciality	**Cohort number**	**Training completed**	**Practice samples submitted**	**Reason for non-participation in study 3**
Physiotherapy	4	Workshop, post workshop feedback, 1-coaching session	Baseline and post workshop	Rotated out of the service before training completed. Unavailable for interview
Physiotherapy	5	None	Baseline	Illness prevented study 2 participation. No training experience to reflect on
Nursing	6	Workshop	Baseline	Change of role prevented further participation. Unavailable for interview
Nursing	6	Workshop, post workshop feedback, 1-coaching session	Baseline and post workshop	Retired following major change to service. Unavailable for interview

Note. Eligible clinicians were those who participated in study 2 within cohorts 4, 5 or 6 (total n=13).

All 13 of the eligible participants consented to the follow-up interview for study 3, although only nine actually completed this element of the research. Table 9-1 contains information about the four clinicians who consented to join study 3 but did not attend for an interview. This includes details of their profession, progression through study 2 (learning MI) and reasons for non-participation.

Table 9-2 (page 244) contains background information on the nine participants who completed study 3 (trainee experiences). Since there was only one physiotherapy technical instructor

involved, to protect anonymity, the detail of each participant's professional background is limited to their specialism rather than the specific role they fulfil.

Table 9-2 *Study 3 Participants' Backgrounds: Profession and Progression Through Training in Study 2 (n=9)*

Study 3 participant number	Speciality	Study 2		
		Cohort number	Training completed[a]	Practice samples submitted[b]
1	Physiotherapy	4	All	All
2	Physiotherapy	4	All	All
3	Physiotherapy	5	All	All
4	Physiotherapy	5	All	All
5	Physiotherapy	6	Workshop	Baseline
6	Nursing	6	All	Baseline, post workshop and post coaching
7	Physiotherapy	6	Workshop, post workshop feedback, 3-coaching sessions	Baseline and post workshop
8	Physiotherapy	6	All	All
9	Physiotherapy	6	All	Baseline, post workshop, post coaching

Note. None of the clinicians who participated in study 3 had participated in study 1.
[a]All refers to attendance for all training including: 2-day workshop, 3x coaching sessions, and feedback on post-workshop and post-coaching practice samples. [b]All refers to submission of practice samples at each assessment point: baseline, post workshop, post coaching and 4-month follow-up.

9.3.2.2 Ethics and research and development approvals

A successful application was made via the National Health Service Integrated Research Application System (REC Reference Number: 11/SW/0358) for a substantial amendment to the protocol for study 2 (learning MI) to include an additional semi-structured interview that provided the data for study 3 (trainee experiences). Appropriate research and development approvals were also obtained.

9.3.2.3 Data collection

Since the author facilitated all MI training activities, a concern was that participants' responses would have been subject to social desirability bias had he also interviewed them. To minimise this possibility a member of the author's PhD advisory team (a Lecturer in respiratory physiotherapy who is an experienced qualitative researcher – Rachael Summers) conducted the semi-structured interviews. Although this person observed one of the 2-day workshops to increase her understanding of MI, she did not participate in it and was otherwise independent.

Interviews were carried out in a private room at each participant's workplace normally within one month of their last study 2 training or assessment activity.[39] A semi-structured schedule was used to guide each interview (see Appendix O, page 439). This was designed to address the study 3 research questions specified in section 9.2 (page 241) and provide specific information to explain the variable skill acquisition and engagement with the training package that was evident during the training study that preceded it (see summary in Table 8-7 on page 236).

Each interview recording was transcribed verbatim by the author following the appointment. Where appropriate, elements of the interview schedule were discussed with the interviewer and modified (for example to explore specific issues during subsequent interviews in more depth or to identify whether unexpected findings were reflective of more general issues).

9.3.3 Data analysis

9.3.3.1 Process

The systematic approach to framework analysis described by Ritchie et al. (2014) and Ritchie and Spencer (2002) was adopted for use in the present study. It is summarised in Table 9-3 (page 247). NVivo version 11 was used to support data management and analysis.

9.3.3.2 Analytical focus

The research questions were driven by the development and feasibility issues that arose during study 2 (learning MI). The initial intention was to develop a coding framework deductively

[39] There was variability in the latency between completion of training and the interview date. Scheduling issues meant that three participants were interviewed after training but prior to submission of their final practice sample. One participant was interviewed 6-months after her involvement in study 2 had ended. This physiotherapist had overall responsibility for several PR programmes within one of the participating organisations and whilst she was unable to complete the MI training beyond the initial workshop, she was well placed to give feedback on the feasibility of MI from an organisational, service design standpoint. As the manager of six of the participants, she was also able to provide valuable insights about how her team received the training and the utility of MI. As such the author was keen to gather her retrospective views.

based on the findings from study 2 that required deeper understanding and explanation. During transcription and the familiarisation process (see Table 9-3, page 247) it became apparent that the data set contained unexpected aspects of participant's experience that were relevant to the research questions, but did not fit neatly with the themes that had been anticipated. It was therefore necessary to combine deductive and inductive coding, whereby issues identified *a priori* were explored deductively, whilst open (unrestricted) coding was used to allow for unexpected elements of participants' experience.

Some elements of the analysis were identified based on the explicit content of the data set. For example, two sub-themes: i) views of training and support and ii) implementing motivational interviewing, were based largely on what participants said. It was also necessary to examine latent themes within the data set. For example, the theme 'Cultural context' was developed after listening to participant accounts of how things worked, what was valued organisationally, and the impact of this context on both PR and MI provision. In this case the cultural issue was implied rather than explicitly referenced.

Table 9-3 *Phases of Framework Analysis Used in Study 3*

Phase	Description of process
1. Transcription	Audio-recordings of interviews were transcribed verbatim (RS).
2. Familiarisation	Transcripts were read and re-read with initial ideas noted (RS). Audio-recorded post-interview notes listened to (RS). Initial notes on transcripts and post-interview notes discussed with RSum to ensure ideas are underpinned and supported by the interview data.
3. Initial coding	Systematic coding of each transcript on a line-by-line basis by paraphrasing or adding a label (a code) to words, sentences or paragraphs that are considered important (RS). Codes to text within first four transcripts discussed with member of the research team and revised where necessary (RS and RSum). Remaining five transcripts coded (RS). New codes and impressions discussed and revised where necessary (RS and RSum).
4. Developing a working analytical framework	Set of agreed codes with brief description forming the initial analytical framework that would be used to code all transcripts (RS). Codes that appeared to be conceptually related were grouped (RS).
5. Applying the analytical framework (indexing)	All transcripts indexed using the categories and codes within the analytical framework (RS).
6. Charting data into framework matrix	Interview data summarised by 'charting' (identifying key elements that are illustrative of each code) into the 'framework matrix' (RS). Re-read transcripts following charting to ensure balance between summarising data and retaining the original meaning (RS).
7. Interpreting the data	Themes that capture the range of participant's views and experiences were developed from interview data by reviewing framework matrix, guided by the research objectives. Thematic map developed with explanatory notes and discussed/refined with member of the research team (RS and RSum). Checking to make sure that each theme captured something important in relation to the overall research aims.
8. Producing the report	Appropriate examples of extracts that best represent each theme/sub-theme were selected (RS). The analysis was linked to the research objectives and literature and a final written report was produced (RS).

Note. RS = Robert Shannon (author of thesis); RSum = Rachael Summers (participant interviewer and member of PhD advisory team).
Adapted from "*Qualitative research practice: A guide for social science students and researchers*" by J Ritchie, J Lewis, C McNaughton-Nicholls and R Ormston (2014) (2nd Edition). Thousand Oaks, CA: Sage Publications.

9.3.3.3 Trustworthiness

Within section 6.3.4.3 (page 147) there is a description of the steps taken to maximise trustworthiness in study 1 (clinician views). The same measures were employed within study 3. An audit trail detailing the procedures involved in data collection and analysis and the step-by-step decisions that were made is provided in Appendix P (page 441).

9.3.3.4 Aspects of presentation

In accordance with guidance from the American Psychological Association (2010), the following edits were used within participant quotations as part of the results section:

(. . .) means part of verbatim material within a sentence that was not immediately relevant to the point being made was omitted.

(. . . .) indicates omission of verbatim material between two or more sentences.

[word] square brackets around author's word(s) to replace a name to protect anonymity, or to add word(s) where meaning would have otherwise been ambiguous.

9.4 Results

Three main themes were identified and are represented in Figure 9-1 (page 249). The first theme (cultural context) describes the culture within which PR clinicians work, focusing in particular on the service and professional drivers that sit in tension with MI. This context helps to explain some of the difficulties that participants experienced whilst learning MI and integrating the skills in clinical practice. The challenge of MI is described within the second theme. Participants referred to the cognitive and emotional difficulties they experienced prior to and during MI-based consultations and described the process of developing and refining skills. As participants progressed through training they reflected on their experiences. Some thought about what they had learnt in the context of previous latent attitudes and ambivalence regarding traditional practice; their insights are also captured within the second theme. A third theme focused on the lessons learnt for the future. This includes insights about the design and delivery of the MI training package as well as the service-related issues that influence MI learning, adoption and implementation.

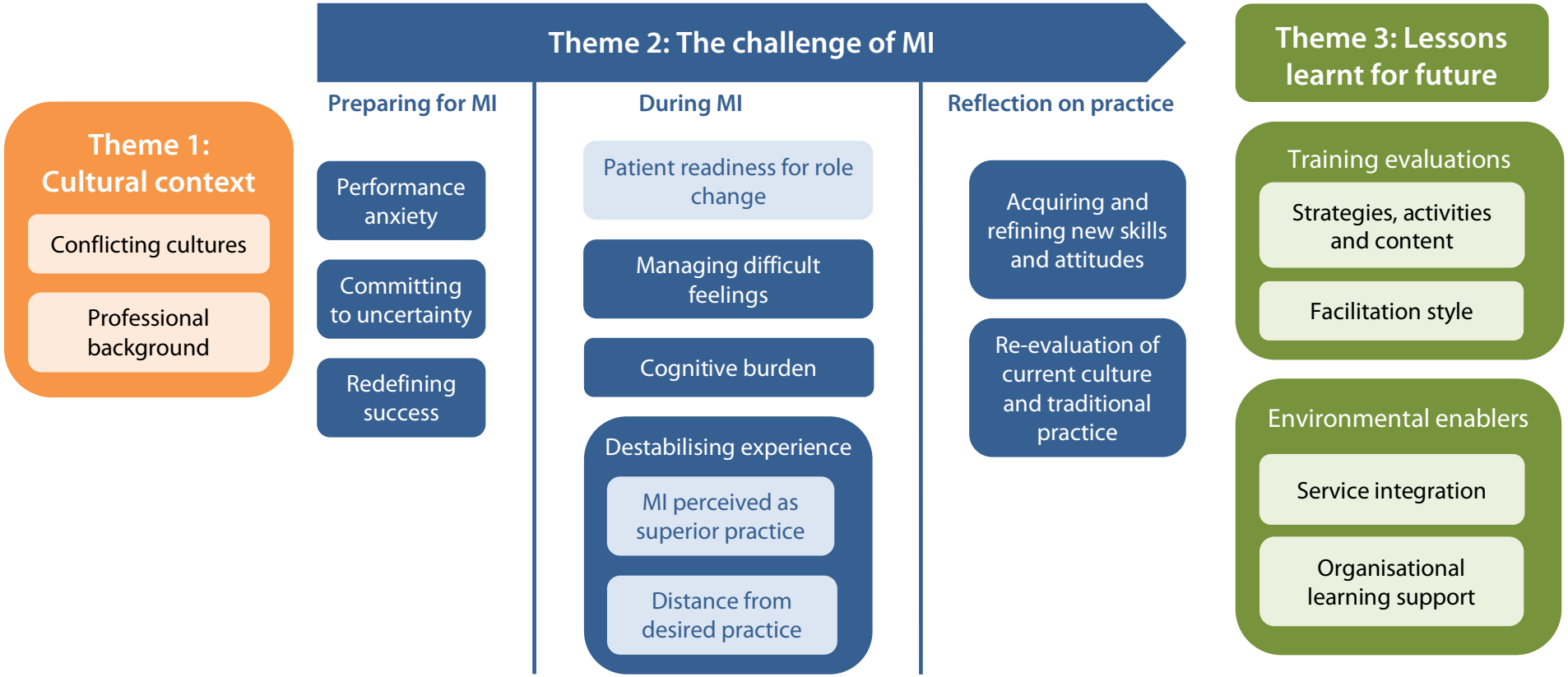


Figure 9-1. Study 3 themes and associated sub-themes: pulmonary rehabilitation clinicians' motivational interviewing (MI) training experiences and insights.

9.4.1 Theme 1: Cultural context



The first theme describes how the culture within which clinicians operate, together with their professional backgrounds shapes their normal way of working. This context helps to make sense of the challenges they faced in learning, implementing and adjusting to MI.

9.4.1.1 Conflicting cultures

Without exception, participants regarded their working environment as a pressurised one. The pressure was particularly evident within PR consultations in which participants described having to undertake several tasks with patients within limited contact time:

> *The assessments are really time pressured, so we probably have about half an hour to do a battery of tests and um quite a lot of – err questionnaires and get the history . . .*
>
> *(Participant 5 - non-completer, physiotherapy; lines 203-205)*

They explained that alongside numerous clinical tasks, another important function they serve is encouraging patients to adopt an active lifestyle during PR and maintain it after the programme has ended. Achieving patient behaviour change within the confines of a short programme was considered to require a high degree of effort and focus on the part of the clinician, which is captured in the following quote:

> *. . . what we're trying to encourage them to do is to have a whole lifestyle change. Um, within a relatively small period of time, whether it be six or eight weeks. Um and I think that demands quite a lot from someone to try and get them on board and encourage them and motivate them to completely change their lifestyle.*
>
> *(Participant 8 - completer, physiotherapy; lines 21-25)*

Having to continuously attend to performance in key areas such patient throughput, attendance and completion rates was considered to contribute to work pressure within the PR service:

Um, yeah it makes it more challenging because, because of what I say about you know you've got to, you do have to consider your target, your completion rates and stuff, because services are um benchmarked against each other . . .

(Participant 3 - completer, physiotherapy; lines 116-118)

Those participants with management responsibilities explained that the design of PR is influenced to a large degree by the interests of Clinical Commissioning Groups that purchase services to meet the needs of their local patient population. Beyond delivering safe care, services are held accountable for providing cost-effective programmes as one service lead described:

It's around funding and you know, having um – we are funded per session, or we are funded per - per hundreds of patients you know, and we have to provide so many hundred - hundreds of patients through the year . . .

(Participant 5 - non-completer, physiotherapy; lines 368-370)

She also explained that having to operate PR within budget constrains results in increased pressure for the service as there is insufficient staff resource available to complete all tasks optimally. For example, organising enough appointments of sufficient duration to enable her clinicians to discuss sustained behaviour change with patients means that she would have to cut costs from other elements of the respiratory service:

So it's all around the assessment process . . . . Yeah, so it's not a case of – people say 'oh, we just need more time', well that's fine because they're not the people having to justify the figures and the budget and the staffing and actually we don't have more time so that is the time we have, that's the time we're given and – yeah we - I can reorganise it but I am only – if I put more time into pulmonary rehab I'm taking time way from something else.

(Participant 5 - non-completer, physiotherapy; lines 365-387)

Participants explained that in light of the financial limitations imposed by service commissioners, they have to prioritise what they do. Whilst many valued encouraging sustained behaviour change in principle, giving time to such interventions was felt to be difficult to justify in services where measures of short-term impact were perceived to be privileged by commissioners. By contrast, interventions lacking tangible short-term effects were seen as less powerful, as participant 1 described:

> *But I do think in the long run, if you can get someone focused and motivated, we know that exercise is a really important part of keeping people well and keeping people well means there's hopefully less um attendance of their GP, hopefully less attendance to hospital. So actually that will have the wider impact, but it's not quite as immediate necessarily. Um and, I suppose it doesn't have as much power.*
>
> *(Participant 1 - completer, physiotherapy; lines 290-295)*

Consequently, clinicians struggled to prioritise endeavours which focused on sustained behaviour change, since the benefits of any time invested would not be reflected in the short-term outcomes perceived to be of interest to commissioners:

> *. . . we've got 3 or 4 different clinical tests we have to do including a 6-minute walk which takes 10-minutes by the time we get there you know um and a few other bits to do . . . . it's not necessarily obviously the top priority . . .*
>
> *(Participant 7 - non-completer, physiotherapy; lines 36-44)*

Another service lead explained that in the absence of having sufficient staff resource to motivate patients and consolidate their commitment ahead of PR, in the service of maximising attendance and programme completion, her team will only accept motivated patients who they consider to have good adherence prospects:

> *. . . if you see someone that you start with who's not sounding very motivated right from the start, and you're just basically thinking, well one of the criteria is they must be motivated. So, you think 'well they don't fit the criteria so let's wrap this up quickly' and then 'cos you know you're in a rush.*
>
> *(Participant 3 - completer, physiotherapy; lines 17-20)*

Whilst restricting access was described by only one participant, she explained that it is commonplace within the PR network she belongs to as services strive to reflect their programme in a positive way to commissioners:

> *. . . and when you go to the pulmonary rehab networks in our region they are so like everyone is so cut-throat, it's all about withdrawal rates and completion rates and all that and they really push you as a group, they really push sort of you know if they've got this wrong – then don't accept them, if they've got that wrong – then don't accept them. If they don't want to do it – don't accept them, and then funnily enough your service looks brilliant because you've got you know 90% completion.*
>
> *(Participant 3 - completer, physiotherapy; lines 92-98)*

Her justification suggested the immediate working environment and broader PR networks have normalised and made the practice acceptable:

> *So, it's not so much that you're doing the patient a disservice you're just following guidelines really that they're not motivated and they're not appropriate, they don't want to do it, let's not waste anybody's time . . .*
>
> *(Participant 3 - completer, physiotherapy; lines 20-23)*

In a similar vein, a physiotherapist from a different organisation explained that a standard procedure is to discharge patients who fail to achieve attendance thresholds:

> *. . . if people miss five rehab sessions then you have to discharge them.*
>
> *(Participant 9, physiotherapy; lines 451-452)*

The privilege afforded to short-term service requirements over the individual needs of patients was frustrating for participants. This frustration is evident in the following quote from a physiotherapist who explained that restricted time prevented her from talking to patients about the things she considered to really matter:

> *But the physiotherapy managers, well they, they just want you to see people as efficiently as you can . . . . But they're only going to know* [how to self-manage] *and feel confident like I say, if they feel confident that you've listened and understood them. So, you get best returns. It's like everything, good quality it's really going to get you a better overall - it's what the NHS don't understand.*
>
> *(Participant 7 - non-completer, physiotherapy; lines 541-550)*

9.4.1.2 Professional background

Beyond service demands, participants considered that their professional background influenced how they normally talk with patients. They described much of their work as demanding a clinician-centred, directive style of communication, for example asking fact finding questions for diagnostic purposes, giving advice to initiate antibiotic medication when there are signs of a chest infection and providing instruction on inhaler technique. There was consensus that this style of working is also relied upon to motivate patients and encourage their engagement with PR. This is illustrated in the following quote from a physiotherapist who described her practice prior to her involvement in the study:

> *Definitely, I think um, before I would have been much more probably prescriptive in what I say and probably talk a lot about all of the evidence and all of what's out there and why people should do it and um - you know all of that do all that big blurb.*
>
> *(Participant 8 - completer, physiotherapy; lines 95-97).*

It was normal for participants to attribute patients' low motivation to deficiencies in knowledge, skill or the 'right' attitude. Helping patients to confront reality through education and advice were described as natural responses to this way of viewing patients. In the following quote a physiotherapist described the approach taken by her and her colleagues:

> *And we tend of kind of think that actually if we tell somebody enough about the benefits and talk to them enough about the whys and the wherefores and – that you'll just – you'll change their mind, as opposed to getting them to do the work.*
>
> *(Participant 5 - non-completer, physiotherapy; lines 106-109)*

Another physiotherapist suggested that some of her team members may be reluctant to use MI or invest the effort required to adjust to its style, reasoning that the approach does not align with their natural or preferred orientation:

> *. . . I do have a feeling that there are some people who probably don't like that kind of um, I want to say softer approach, but it's not soft . . . . not quite direct I suppose.*
>
> *(Participant 1 - completer, physiotherapy; lines 303-306)*

Moreover, the use of direct approaches might be reinforced within time-pressured environments where efficiency is prized:

> *. . . for me it's easier just to do the questions because I can get the answers and we can move onto each stage and you can get the next person in - which is what we have to do at the moment.*
>
> *(Participant 4, physiotherapy; lines 106-108)*

One participant explained that the ease of learning different elements of MI might be influenced by a clinician's profession. She argued that physiotherapists are primarily schooled in goal setting and planning for change around exercise and so this element may come more naturally to them relative to their nursing colleagues:

. . . physio training is generally around goal setting and what you're actually trying to achieve and creating a plan of action to get you there. I don't think the nurse - nursing training isn't in quite the same – it's problem solving but it's less goal setting related I think. So that doesn't come quite as easily to them.

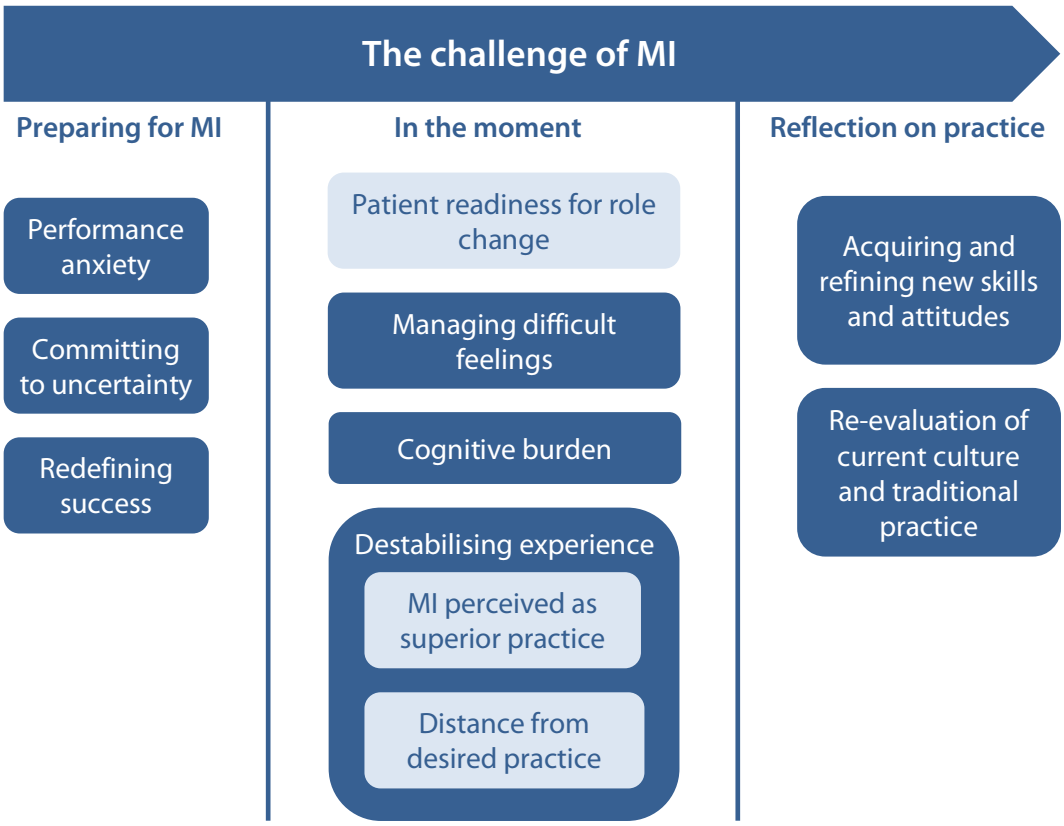
(Participant 5 - non-completer, physiotherapy; lines 46-50)

By contrast, she considered listening to patients to be more familiar terrain for nurses, which she believed may put them at an advantage for learning MI:

. . . perhaps as physios we are worse at it than nurses are, because of what we do is a lot of education, we tend to do a lot of talking and not a lot of listening.

(Participant 5 - non-completer, physiotherapy; lines 105-106)

9.4.2 Theme 2: The challenge of motivational interviewing



The second theme is focused on the challenging nature of MI and comprises nine sub-themes that are conceptualised on a time continuum. Participants explained that MI differs fundamentally from the methods they traditionally employ to encourage behaviour change and as such, they experienced cognitive and emotional challenges whilst learning and applying the

skills. Some of the challenges occurred prior to MI sessions and are described in the section 'Preparing for motivational interviewing' (9.4.2.1, page 256). Others arose as participants tried out their skills and are captured within the section 'During motivational interviewing' (9.4.2.2, page 261). Participants noted that MI can be challenging for patients as well, explaining how it encourages them to take a more active role in consultations than they are used to or necessarily feel comfortable with. These issues are also described within the section titled 'During motivational interviewing'. Finally, learning about the underpinning theory and principles of MI provoked some to challenge and re-evaluate practices such as selective recruitment of patients, which prompted new reflections on their desirability. The insights gained, together with participants' perceptions of the progress that they made in acquiring MI skills and adjusting to this new style of working are captured in the section titled 'Reflection on practice' (9.4.2.3, page 267).

9.4.2.1 Preparing for motivational interviewing

9.4.2.1.1 Performance anxiety

Participant accounts highlighted several points in the training where they experienced performance anxiety. Some became anxious during the initial workshop as they envisioned using MI with patients and wondered whether they would be sufficiently skilled. This is captured in the following quote from a nurse who reflected on the demonstrations of practice from the workshop trainer:

> *I kind of sat there thinking, 'oh, he's* [MI trainer] *just always got the right thing to say'. Um, because it is perfect, you know that just the right thing and you know I thought, 'Oh you know, how many years has he been doing psychology for - to almost have those sayings that just seem to come naturally?' Um, and so it was a bit of 'Oh I don't know if I can ever do this'.*
>
> *(Participant 6 - non-completer, nursing; lines 372-377)*

Recording practice samples for evaluation and feedback purposes was also described as anxiety provoking. Underlying the feelings of anxiety were concerns about exposing skill deficits and the potential for negative judgment. Some participants implied that this was symptomatic of an inherent achievement motivation and fear of letting ones-self down:

> *. . . that's when I started putting the undue pressure on myself that I had to get it right and I had to say all the phrases and bits and pieces. Um just 'cos of the way I am, it wasn't put upon me that was just how I felt so I was getting a bit stressed about it.*
>
> *(Participant 4 - completer, physiotherapy; lines 178-181).*

Concern was also expressed about the potential for patients losing confidence in them if they appeared unskilled:

> *But they don't like to see you floundering, do they? They, they want to have confidence that you know where you're going and what you're doing.*
>
> *(Participant 7 - non-completer, physiotherapy; lines 615-617)*

Participants described several consequences of their performance anxiety. One common experience was that it interfered with their MI skills. For example, it undermined their ability to recall key elements of MI practice during clinical consultations:

> *I was like, so worried I wasn't going to say what I needed to say that um, yeah, I think I was getting a little bit like blinkered. Like I knew I kind of remembered the one or two things that were stuck in my mind.*
>
> *(Participant 2 - completer, physiotherapy; lines 37-39)*

Concerns about negative judgment also meant that participants tended to only submit recordings of practice for assessment and training purposes in which they had been able to integrate sufficient MI that they believed was of an acceptable quality:

> *If I'm doing a recording then I want to make sure that I've got - I can do it well so that I can actually - Rob can assess- I'd rather him to be able to assess a good one than a bad one.*
>
> *(Participant 1 - completer, physiotherapy; lines 458-460)*

Although participants described the experience of performance anxiety as uncomfortable, the majority viewed it as a normal and manageable precursor to learning a new clinical skill. These individuals framed skill deficits as temporary and consequently embraced opportunities to develop their skills:

> *I always try and put my hand up to participate in those sorts of things because I get more out of it if, than when I'm just sitting there watching. I mean I don't like standing up in front of people, it makes me very uncomfortable, but I, I know that sometimes that's the best way to learn things.*
>
> *(Participant 4 - completer, physiotherapy; lines 300-303)*

In a similar vein, another participant found that by focusing on the benefits that improved skill would bring for her patients, she was able to stay engaged with the training when she experienced difficulties:

> *I think just knowing that it was only Rob listening and you know – and um and also that it's for my own benefit but also a patient's benefit as well. If they are going to be more motivated to do something, then they are going to get better health at the end of it so um it's just kind of getting on with it.*
>
> *(Participant 8 - completer, physiotherapy; lines 267-270)*

By contrast, a minority were more consumed by their feelings and found the learning process somewhat threatening. One participant in particular found the group context unsafe and expressed stronger feelings about being exposed, albeit she completed the training. This participant described herself as having low levels of confidence more generally and explained that her feelings were driven in part by negative self-evaluation of her competence and confidence relative to her colleagues:

> *. . . I felt uncomfortable doing like, cos, you know sitting chatting to people and all that I didn't really – any of that I didn't like to be fair but that is just me. Other people, it doesn't bother them at all . . . . I don't like speaking out and like if someone asks a question and you have to answer out loud in front of people, I've never liked doing that.*
>
> *(Participant 2 - completer, physiotherapy; lines 478-485)*

This participant also expressed concerns about individual supervision. Whilst she had an intellectual insight that sessions would be supportive and encouraging, she still experienced them as threatening on an emotional level:

> *I know that like Rob isn't judging me, I know that. He's only trying to help and teach me, but um, I just found it a little bit scary . . .*
>
> *(Participant 2 - completer, physiotherapy; lines 464-465)*

9.4.2.1.2 **Committing to uncertainty**

Another challenging aspect of MI arose from the increased control that the method affords patients in the direction and content of consultations. In contrast to traditional, highly-structured question-answer medical type interviews in which the clinician keeps tight control of the conversation to gather specific pieces of information, delivering MI transfers more of the power to the patient. Patients have more freedom to explore issues that are important to them and are encouraged to think about and express their thoughts and feelings in more depth than they normally would. Whilst this was deemed helpful for patients and considered to provide insights that would not have otherwise surfaced, participants expressed concern that it introduces the potential for more protracted discussions that may stray into unforeseen areas and necessitated additional time being devoted to their consultations:

> *. . . one of the struggles for me is the, um – the timing element in that you have to commit yourself to a certain amount of time.*
>
> *(Participant 8 - completer, physiotherapy; lines 182-183)*

The potential for more protracted conversations was considered to be greatest in the early stages of learning MI because unrefined focusing skills often meant that patients would drift off topic and give excessive detail. For many participants this was unsettling:

> *. . . the fear of them talking forever and opening such a broad can of worms. Because you have to direct people at the best of times and then just the thought of so 'tell me about your breathing' and you think 'ah'.*
>
> *(Participant 9 - completer, physiotherapy; lines 272-274)*

The notion of uncertainty extended beyond consultation duration. Since MI seeks to increase the patient's involvement, such that patient's ideas and interests influence its focus and trajectory, clinicians do not know in advance *how* conversations will unfold and what, if any, decisions will be made. Participants varied in their ability to tolerate such ambiguity. Some found it anxiety provoking and explained that their own agenda detracted from their ability to remain open-minded about what the patient brought to the discussion:

> *. . . with everything that you've got going on in your head . . . . there's a much higher feeling of vulnerability I think for me as a clinician because I don't know where they are going. It's like a train I can't control.*
>
> *(Participant 7 - non-completer, physiotherapy, lines 11-16)*

By contrast, a small number of participants were less threatened by these uncertainties. They appeared to be more comfortable with the prospect of allowing patients to work through their ambivalence at their own pace and were less inclined to resort to telling the patient what to do as a way of coping. The idea that the motivational process cannot be rushed is captured by participant 5:

> *It's not a process that you can* [rush] *. . . but also the point of motivational interviewing is you're not telling them, you are making them work it out for themselves and so, you know, that takes longer. It's that temptation* [not] *to push the interview along.*
>
> *(Participant 5 - non-completer, physiotherapy; lines 321-325)*

That this participant did not seem overly concerned may be the result of having sufficient autonomy as service lead to be flexible with appointment duration.

9.4.2.1.3 **Redefining success**

Participants explained that another challenging element of using MI was having to modify their attitudes and beliefs about what constitutes a successful outcome of a behaviour change conversation. In this sense, success is not defined by a patient making what the clinician thinks is the 'right' choice, it is about facilitating the patient to identify their own 'right' choice. A nurse explained that supporting autonomy when patients make decisions that are at odds with medical wisdom can be particularly difficult:

> *. . . I suppose also accepting that something that I personally so strongly believe in when somebody makes a choice that they're not going to do it it's kind of accepting those things. So MI, there's a lot more to it than just the consultations it's actually to do with changing beliefs and giving people options and people have got choices when you kind of think 'oh, those choices are just so rubbish' . . . . I find I get quite exasperated.*
>
> *(Participant 6 - non-completer, nursing; lines 461-466)*

The challenge of respecting autonomy when patients make what clinicians consider to be poor choices was reiterated by participant 9. She explained that a natural inclination, particularly prior to training was to make internal attributions for patients' decisions. Consequently, when patients did not follow her advice, she would view that as a personal failing which would undermine her professional identity:

> *. . . you get upset because you're giving them all your advice and they're not listening, and you think 'If they don't do it then I've failed as a practitioner'.*
>
> *(Participant 9 - completer, physiotherapy; lines 46-47)*

9.4.2.2 During motivational interviewing

Participants described several issues relating to both the patient and the clinician that make MI difficult to use.

9.4.2.2.1 Patient readiness for role change

The first issue relates to patients' willingness to take more of an active role in consultations than they are used to. Participants described how patients' expectations for their role and responsibilities are informed to a large degree by their prior interactions in the medical context. They explained that the majority of patients they encounter are used to being told what to do and do not expect or understand the rationale for a revised role:

> *. . . it's just been a role reversal in a way, that I think patients find quite challenging as well because they are used to coming in and listening to a clinician telling them what to do and going away again . . . . they're still going – 'Yeah but you can tell me the answers'.*
>
> *(Participant 7 - non-completer, physiotherapy; lines 18-24).*

Participants indicated that some patients are hesitant to engage in discussions about increasing their exercise and offered two possible reasons. At a basic level, the quality of referral for PR can be variable and as such, some patients are unaware that they have been referred for an exercise-based programme:

> *A lot of the time they get sent to us and they don't know what they have been sent for, they really don't know the details.*
>
> *(Participant 1 - completer, physiotherapy; lines 125-127)*

One participant surmised that patients may avoid considering their situation in depth as a means of protecting themselves from what they predict will be unpleasant emotions:

> *. . . through MI you're getting them to think about something that they've never thought about before whether that's because they've automatically not wanted to go there or because they just generally haven't thought about it.*
>
> *(Participant 8 - completer, physiotherapy; lines 228-231)*

These thoughts were echoed by another participant who noted that sensitivity is required when raising and exploring what she considered to be challenging subject matter. Here she describes how complex reflective listening statements can help to reveal patients' true thoughts and feelings, which they may have been reluctant to share:

Um, and trying to get those complex reflections which I think are the enabling bit to finding out what is, what is their emotion. Because a lot of people don't like to show it and won't give it over easily um, which is, you know, understandable.

(Participant 1 - completer, physiotherapy; lines 201-204)

9.4.2.2.2 **Managing difficult feelings**

Whilst emotive issues such as poor quality of life, activity limitation and mortality surface during traditional consultations, using MI was believed to increase the probability that patients will share their thoughts and feelings about them. Participants varied in the extent to which they felt confident in handling such issues. Some expressed concern that listening to patients emoting about their situation would trigger emotions of their own that would interfere with their ability to help:

But I just sometimes they do open up to me and tell me things which sometimes might surprise me or like make me feel a bit sad . . . . I start feeling quite sympathetic . . . maybe too sympathetic and may be a bit showing too much understanding isn't helpful in some ways.

(Participant 2 - completer, physiotherapy; lines 137-150)

Others described being able to tune into patients without over-identifying with the issues they present or being consumed by their own feelings:

I've had experiences when the patients become upset and been tearful but not in any anger tearful or upset but more um, yeah identifying what they're feeling. And you know I'm not worried about if somebody's you know I don't feel uncomfortable if somebody's crying in front of me. Um I just want to help them so they don't feel uncomfortable.

(Participant 1 - completer, physiotherapy; lines 232-236)

Some participants expressed concern that certain aspects of MI may *cause* patients distress, for example the principle of developing discrepancy. This involves exploring a patient's values and aspirations and encouraging them to think about how their current behaviour and/or health situation influences their ability to lead the life that they want. The aim is to develop an internal conflict, which serves as a motivational force that triggers change. Although this is facilitated in an empathic atmosphere, without coercion, some participants described feeling uncomfortable whilst they witnessed patients recognise painful realities:

And actually I found that [developing discrepancy] *quite a potentially – not threatening, but quite a – um - a, you know Rob has this lovely way of saying things that you kind of think 'oh that's really nice'. . . . It's not kind of like 'and if you don't do this, this is going to happen to you' . . . there's nothing aggressive about it, it's all about whether they – it's right for them or not. It's all about their decision for their own reasons. Um, so you're not putting something onto them, but then you kind of hit them with you know – ' how do* [you think] *you'll be in 6-months' . . . it doesn't – sit very comfortably with any of us.*

(Participant 5 - non-completer, physiotherapy; lines 121-135)

This participant attributed the difficulty of this aspect of MI to beliefs about her role in protecting patients from uncomfortable feelings and concerns that facilitating a discussion in which patients confront their choices may be detrimental to their relationship:

You always want to say things that are going to make them feel better . . . . that's why we all do the job - we always want to make everything better and . . . improve your relationship with the patient.

(Participant 5 - non-completer, physiotherapy; lines 117-121)

Another participant referred to what she had been taught during the MI training about the benefits of achieving depth in the conversation, but expressed uncertainty about how to employ the strategy in practice:

But I do know that Rob talks about you know it's good to let them sit in that uncomfortable-ness for a while to be able to really think. Um, so yeah, it's a bit of a challenge, but how far do you push, how far do you go?

(Participant 1 - completer, physiotherapy; lines 236-239)

9.4.2.2.3 **Cognitive burden**

Whilst on initial exposure MI appeared deceptively simple to participants, its complexity became apparent as they progressed through training and attempted to use the skills with patients. Many described being overwhelmed by the volume of knowledge that underpins practice and the challenge of using novel skills in the clinical context. The difficulty of using MI was contrasted with traditional practice, which for experienced clinicians involves well-rehearsed skills and routines. An example is provided by a physiotherapist who described having automated many of the key elements of her normal practice and contrasted this with MI where the in-session demand to remember each element was considerable:

> *It is quite hard, it makes, for me an assessment is fairly easy, I have to think obviously but I don't have to, it doesn't tax me very much, but this is like - okay I have to think about not every word, but you know the tone that you're doing it, are you asking a question are you making a statement?*
>
> *(Participant 1 - completer, physiotherapy; lines 205-209)*

In the hope of alleviating some of the cognitive burden, it was common for participants to make notes about when to and how to initiate particular strategies and skills for use during consultations:

> *I did spend ages like reading though it and making myself like little notes and I even pinned them up on the wall behind where the patient was sitting to prompt me*.
>
> *(Participant 2 - completer, physiotherapy; lines 25-27)*

This was not always helpful, though and a small number expressed concern about how it might be perceived by the patient:

> *But then I thought I can't keep staring over their shoulders. I was like waiting for them to look away and quickly glancing up.*
>
> *(Participant 2 - completer, physiotherapy; lines 576-577).*

Beyond being able to initiate different MI strategies, skilful practice involves responding flexibly thereafter based on what the patient says. Without exception, participants regarded developing the conversation and responding to patients in the moment particularly challenging. Participant 1 referred to this difficulty in the context of evoking patients' deeply held motivations, which are not always immediately apparent:

> *I had fairly good understanding of it and could do a basic version of it. And I think focusing that a little bit more and getting better has been a little bit of a challenge to actually to go deeper . . . . I still don't find it easy to get that, that emotional bit, but I know that's my that is, the back of my head is my focus to try and get that from them.*
>
> *(Participant 1 - completer, physiotherapy; lines 187-195).*

The difficulty that participants had recalling key pieces of information during MI meant that they tended to focus their attention internally (on what they should say next) at the expense of listening carefully to the patient. This common experience is captured in the following quote from participant 4:

I probably wasn't giving listening one hundred percent at the time because I was too busy worrying about what the next thing I had to say was.

(Participant 4 - completer, physiotherapy; lines 380-381)

Participants remarked that given its complexity, using MI involves a significant investment of effort and concentration, particularly at the novice stage of learning. They described having to be disciplined in order to develop the conversation appropriately and because of this they would sometimes stop short of what they were capable of:

. . . they might say 'Well I'll give it a go' . . . whereas . . . if you put a bit more time into really building that up and maybe finding out a bit more well what is your real motivation for this? And what's going to keep you going at times when it gets difficult? You know those extra things. You might be able to make it um, a bit of a stronger, stronger 'YES!'

(Participant 3 - completer, physiotherapy; lines 289-294)

9.4.2.2.4 **Destabilising experience**

The early stages of learning and implementing MI was described as unsettling. Participant accounts suggest that this 'destabilising' experience was created when they perceived MI to be superior to their normal way of working but simultaneously recognised their MI practice was not as strong as they would like. As novices, their MI skills felt awkward and mechanistic when they began to transfer what they had learnt to the clinical environment and many described floundering during consultations.

Motivational interviewing perceived as superior practice

Following MI training, participants reflected on the effectiveness of the methods they traditionally employ to encourage behaviour change in the context of what they had just learnt. The majority appraised their practice negatively, which was disconcerting for them given the central role that motivating patients has in their work:

. . . it's like you're learning a whole new skill and it's something that you assume that you're good at - listening and motivating and doing all those things so you're – it's a bit of a – 'Oh right okay I'm not actually doing – I'm not actually doing that'.

(Participant 8 - completer, physiotherapy; lines 332-335)

Most participants felt that a particularly challenging aspect of their role is encouraging patients to commit to regular exercise. As one explained, in the early phase of rehabilitation patients need to invest a significant amount of effort for a sustained period before they begin to notice

any benefit, and in the absence of reinforcement they are at an increased risk of relapse. She believed that relative to traditional practice, MI leads to deeper, more meaningful conversations that carry potential to consolidate patient's commitment from the outset and thus pre-empt this risk:

> *Yeah, I think it's a really powerful . . . because I think a lot of people don't think about the consequences of any of the stuff we do . . . . we're all about the here and now aren't we? I need to commit to doing it for three months* [PR] *before I know it's going to make a difference, am I prepared to do that? And we just don't - and I don't think we are – aggressive isn't the right word – but I don't think we are very good in healthcare about – about having those conversations.*
>
> *(Participant 5 - non-completer, physiotherapy; lines 159-173)*

Distance from desired practice

Whilst MI was perceived by participants as being superior to their normal way of motivating patients, using the skills in clinical practice was unnerving as it involved substituting a familiar approach with something that felt unnatural and uncomfortable. One participant described the experience as 'stilting'; MI felt contrived and mechanistic as she struggled to personalise the language and style:

> *I think it's just that kind of 'aah – where do I go now?' Oh – partly that – where do I go now? and stilted is partly just that- that sort of – I call it psychological speak that you know I'm kind of not used to – and I don't quite know what that means but it's almost saying exactly the right thing at the right time.*
>
> *(Participant 6 - non-completer, nursing; lines 203-206)*

Other participants described clinical scenarios in which their current skills were not sufficient to address the patient issue they encountered. For example, participant 3 described feeling 'thrown' when patients did not perceive exercise to be a helpful component of their disease management:

> *We've got a good understanding of their problems; they've got their trust in me I think but . . . they aren't convinced it will work basically. . . . Apart from just explaining to them that what we find about exercise being helpful, I think just sometimes they look at me like 'yeah right'. So, you know, that is usually when I am a bit thrown.*
>
> *(Participant 3, completer, physiotherapy; lines 214-219)*

Whilst reflecting on less productive MI consultations, this participant questioned whether her attempts were any more effective for motivating her patients than her normal approach:

> *Because I'm so new to it, they'll say something and I'm a bit, not thrown, but I feel like I don't, don't end up doing any better job than I did before you know so it's not, although my overall feeling's very positive I do feel that sometimes I get a bit thrown . . .*
>
> *(Participant 3 - completer, physiotherapy; lines 188- 191)*

Although all participants found implementing MI destabilising, there was variation within the sample regarding how unsettling this was. One service lead argued that this could be explained by clinicians' level of experience with methods that are conceptually opposed to MI. She argued that more senior colleagues may experience greater difficulty adjusting to MI given the need to modify entrenched attitudes, beliefs and assumptions about behaviour change and relinquish well-rehearsed ways of responding:

> *And I think that the more senior, older staff found it more threatening, more difficult than the younger because . . . having that consultation that you're so used to you could do it in your sleep and actually having somebody come and say actually no, I know that's how you would normally do it, but I want you to try doing it this way, is more difficult. It's like you know – its teaching an old dog to do a new trick . . . . I think the newer staff found that more easy because they're less – they're still not that comfortable with other ways of doing it.*
>
> *(Participant 5 - non-completer, physiotherapy; lines 483-495)*

Feedback from an experienced physiotherapist who struggled to modify her normal practice lends support to this idea:

> *I'm so used to doing my assessment how I've been doing it, that to then change it around and not be filling in boxes and doing things and giving them the chance to talk about their day, was a bit of a struggle to – to change because once you've been doing something for a while you get into a bit of a patter . . .*
>
> *(Participant 9 - completer, physiotherapy; lines 72-76)*

9.4.2.3 Reflection on practice

As participants progressed through the study, they reflected on the pattern of their skill development and also how their attitudes, beliefs and assumptions had changed over time.

9.4.2.3.1 **Acquiring and refining new skills and attitudes**

Without exception, participants' confidence in their ability to use MI increased through training. For example, a nurse, who in the early stages of training had expressed concern about MI feeling contrived and mechanistic, described how she had developed more fluency and comfort with some of the skills through practice:

> *I mean I certainly feel much more comfortable about that usual day, um and just keeping people focused on 'Was yesterday a normal day for you?' and just bringing them back to where we're going and what we are doing, 'Was that yesterday, was that –? ' um and, and that feels completely natural.*
>
> *(Participant 6 - non-completer, nursing; lines 216-220)*

Beyond improvements in specific skills, participants reported changes in their thoughts about patients and their own role in the behaviour change process. Their accounts suggest that their revised attitudes and beliefs enabled them to approach consultations differently. For example, one participant described an enhanced ability to demonstrate acceptance when patients are not ready to change. Her narrative suggests she now feels less internally driven pressure to push patients into committing to PR and instead places more value on a collaborative relationship and respecting patient choice:

> *I feel more comfortable now when patients are not wanting to say participate or not willing to have that conversation because instead of kind of trying to force the point again, I'm more aware of actually thinking about them and what they're thinking and what they might be feeling about the process and probably being a bit more empathetic and um yeah, probably allowing a bit more of a two-way conversation rather than my just giving them the blurb and then hoping they will sign up after it.*
>
> *(Participant 8 - completer, physiotherapy; lines 108-114)*

Further evidence of the emergence of facilitative attitudes came from participant 9. She described how she is less likely to personalise the fact that patients do not always share her enthusiasm for change:

> *I feel less - you know, less negative about if they don't want to do something and it's - you know, 'Well it's your choice, so you can choose' . . . . and I think that's helped because it's not personal, it's just that they're not in the right place and time to do what you want them to do or what would benefit them. They have to decide.*
>
> *(Participant 9 - completer, physiotherapy; lines 440-445)*

Accounts from other participants reveal a perception that they had become more open to the humanistic perspective on what promotes change, but they had yet to fully embrace the spirit of MI. For example, participant 6 discussed how demonstrating acceptance entails a significant cognitive shift and implied that, for her, this way of being is a work in progress:

> *And it's accepting that those tensions exist . . . . so it's trying to accept people for what they are or their beliefs and what choices they make but being non-judgmental and it's very difficult to do that.*
>
> *(Participant 6 - non-completer, nursing; lines 472-475)*

Whilst participants described a positive trend of skill development, they perceived that the pattern of change was not linear. This was evident even during the initial workshop where some described having a fleeting grasp of the skills. Despite being warned to expect fluctuations in confidence, some expressed frustration about not feeling entirely in control:

> *Um, you kind of came away at the end of each day - it was, it was very up and down because I get annoyed at myself when I don't understand things or get it, but he said, he fully explained at the beginning that that's how you'd be, you'd kind of get it and then you wouldn't get it . . .*
>
> *(Participant 4 - completer, physiotherapy; lines 170-173)*

Participant's perception of their skill development was informed largely by the results of their attempts to use MI in practice. Whilst positive outcomes generally enhanced their feelings of competence, their accounts also suggest that challenging consultations could leave them feeling deskilled and undermined their confidence. Feedback provided during supervision sessions sometimes had a similar effect by highlighting discrepancies between actual and desired performance and led to an increased awareness of the complexity of MI. Whilst this was deemed important to focus attention, it provided a reminder of the requirement for further development as the following quote from participant 7 highlights:

> *Because I never quite – you can't finish MI – you know what I mean, it's like an on-going expansion of your knowledge and the way that you practice. You know, you can do aspects of it well but you can always perfect it. Um, so you never come out of a coaching session going 'Right then - you know - I was perfect, off I go!'*
>
> *(Participant 7 - non-completer, physiotherapy; lines 407-411)*

In general, participants believed that on-going practice was important for on-going skill development, with most being optimistic about future gains:

> *. . . I've had the three or four coaching sessions and it's still a new concept . . . . But yeah, I mean if, if for example you were to say from today onwards that's all we could use I'm sure in six-month's time it would be as fluent as what I used to know and there wouldn't be much difference . . .*
>
> *(Participant 4 - completer, physiotherapy; lines 33-41)*

Not all participants were so positive though. Participant 2 who, found learning MI particularly challenging expressed less confidence about what she was ultimately capable of:

> *But I don't think I am ever going to be fantastic at it anyway.*
>
> *(Participant 2 - completer, physiotherapy; lines 122-123)*

9.4.2.3.2 **Re-evaluation of current culture and traditional practice**

Whilst two participants described and gave a rationale for practices such as selective recruitment of patients and early discharge for sub-optimal attendance (see sub-theme: Conflicting cultures), these participants' exposure to MI training prompted new reflections on the desirability of these things and an awareness of competing values that had largely been unrecognised up to that point. In both cases, the participants felt such practices were counterproductive. For example, participant 3 reappraised selective recruitment of patients on ethical grounds and from the patient perspective. She concluded that despite the pervasive cultural pressure to maximise key performance indicators, it felt morally and ethically right to focus on each patient's individual interests and welfare, rather than taking the decision about joining away from them:

> *And actually, I'm sitting there now thinking you know the complete opposite really, you know, yeah. Some of those people you've been turfing out may well have done really well, or they may have completed three quarters of the course and got something out of it you know so it's going very target driven and all that so that doesn't sit well. But I hadn't really thought of it much before because I guess I didn't have the other voice, I just had the network and the more err service targets and particularly because I am a manager of the service.*
>
> *(Participant 3 - completer, physiotherapy; lines 98-104)*

This participant went on to describe her intention to raise her concerns amongst her managerial network, though she reserved judgement as to whether her colleagues would change their views:

But um, I think the, although there is that pressure, I feel that I'd kind of, for now, I feel like I'd just argue my case really um, I feel quite strongly about it. So, although service pressures are a little bit more one side, I think you, I think the arguments for patient care and stuff are a lot stronger. Whether people agree with me or not, but I'd go to these networks and push forward that case and try and get them to come my way more than the other.

(Participant 3 - completer, physiotherapy; lines 131-136)

The MI training prompted another physiotherapist to reflect on the practice of discharging patients who fail to achieve attendance thresholds required by the service:

Well before it was just – you know, this is what we have to do - if you don't come then you know we have to discharge you. But now you think 'well you're doing something' . . . . so you're less adamant about getting it right and more looking at the person and how they're benefitting from it.

(Participant 9 - completer, physiotherapy; lines 473-476)

9.4.3 Theme 3: Lessons learnt for the future



The third theme captured participants' reflections on the MI training they received and insights about how it may be improved for future trainees. A consistent theme was that if MI were to be adopted as part of routine care, then changes would need to be made at the organisational level to support its integration. These include the provision of adequate support for trainees to acquire and refine MI skills, and changes to PR programme and consultation structures.

9.4.3.1 Training evaluations

The training evaluation sub-theme captures participants' experiences of the training they received through study 2 both in terms of the focus, content and delivery style of the training package. It also highlights changes to PR services that would be needed to facilitate its integration should it be adopted.

9.4.3.1.1 **Strategies, activities and content**

Participants' perception of the value and practicality of the MI training and supervision they were offered is captured within this sub-theme.

Workshop training

Overall, the workshop element of training was well received, but considered demanding. Three of the training cohorts involved in study 2 (learning MI) received workshop training on two consecutive days. For logistical reasons it was necessary to deliver the 2-days for the remaining three cohorts on the same day of the week with 1-week separation. Although the author was concerned that splitting the days might undermine learning momentum, the general feeling amongst participants was that the intensity of the workshop made this a better proposition. This view was expressed independent of the type of workshop format actually attended:

> *I think that was good and having it separated a bit to think about, for me was great . . .*
>
> *(Participant 1 – completer, physiotherapy; lines 324-325)*

All participants attended workshop training alongside colleagues from their clinical team. Whilst team training was viewed positively in bringing staff together, three participants occupying junior positions were unsettled by having to train alongside more senior colleagues over concerns about negative judgment:

> *So, worrying, firstly worrying about saying the wrong thing or not knowing what to say, you know like when* [workshop colleague] *was looking at me, that kind of put a bit more pressure again, so maybe had he/she have not been there might have felt different.*
>
> *(Participant 2 – completer, physiotherapy; lines 726-729)*

One of the practical elements of the workshop that participants commented on was the use of role-play in which they took it in turns to play the part of a patient, whilst their partner rehearsed their MI skills. They explained that this felt contrived because the patient role required them to guess how a patient would respond, which they found difficult. This in turn meant that the clinician did not get an authentic response to their counselling efforts:

> *I found it difficult to do the role-plays . . . . it's nothing like being with a patient . . . and no matter how good an actor you are . . . . it didn't feel quite right.*
>
> *(Participant 8 – completer, physiotherapy; lines 358-364)*

The preferred approach was 'real play', in which the 'speaker' discusses something that is real to them, rather than pretending to be a patient. One physiotherapist described how her partner's

use of MI during a real play prompted her to think differently about a behaviour she was considering changing. The positive outcome also increased her perception of the value of MI for her patients, which boosted her motivation for learning more:

> *. . . it did really make me think um differently about it, and I'm someone that, because I know the facts, I know what I should and shouldn't do, so I wouldn't have thought that there would be much extra that people could say that would make me more motivated. It did a little bit, so then you get interested don't you because you can see it working from your own perspective so I think that, that was a really good way of um increasing your understanding of the technique, but also increasing my sort of motivation to want to learn more about it and try and use it with patients.*
>
> *(Participant 3 – completer, physiotherapy; lines 426-433)*

Another participant shared this positive perception. She explained that being in the speaker's role during real plays prompted her to reflect on those elements of her partner's practice that were most helpful to her. This deepened her understanding of the process of MI and prompted her to think about the implications for her own consultations:

> *I think it's good to know what that feels like so when you're doing that with patients you know what's happening. And the way that asking a question or the way you're asking a question or reflecting back impacts you so I think that was good.*
>
> *(Participant 1 – completer, physiotherapy; lines 405-408*

Whilst in general, real plays were considered to be superior to role-plays for learning MI, participants saw value in using a balance of the two. As participant 8 implied, the issues that respiratory patients present with are different to those raised by colleagues. Therefore, role plays were considered a useful adjunct that enabled clinicians to practice the specific way that MI strategies may be applied in the clinical context:

> *I think it* [role-playing clinical scenarios] *was all important to firm up your understanding of how you might use it in real life.*
>
> *(Participant 8 – completer, physiotherapy; lines 377-378)*

Supervision

Following workshop training, participants were offered five individualised supervision sessions to consolidate and refine what they had learnt and to support the integration of MI into clinical practice. A consistent theme was that supervision was a vital component of training:

. . . what you understand from the 2-days is really important, it's kind of the kind of bare bones of it, um -but it needs – the coaching sessions would be the most important thing, I think.

(Participant 7 - non-completer, physiotherapy; lines 252-254)

All participants who attended for supervision described sessions as a good opportunity to work on the challenges they faced in using MI. For example, participant 9 focused on 'personalising' MI, and integrating the skills within normal practice:

So, we re-jigged it, so it was something specific to me and I think that was really useful because it was more about how I talk and how I do an assessment. And I could connect with it a lot easier than – this is generally the motivational interviewing thing, and can you put it into how you do an assessment. So, if it was more specific . . .

(Participant 9 – completer, physiotherapy; lines 201-205)

As part of supervision, participants received feedback about their practice based on MITI analysis of audio-recorded consultations. This was discussed face-to-face and supported by a written report. Whilst a minority of participants found this quite daunting, most indicated that they valued the feedback, with the numbers acting as a catalyst for thinking about how to develop their skills further:

. . . I think that having Rob's feedback was really helpful and the written feedback as well . . . the competitive side of me – I compared to what I should be or how I was last time, um, I don't know if I necessarily improved much over the time, um but for me it was more about my thought processes than actually scores although that was nice to see.

(Participant 1 – completer, physiotherapy; lines 390-396)

Commonly, participants found it helpful to listen back to recordings during feedback sessions. Since working memory was not burdened by the need to respond to the patient in the moment, this provided an opportunity to focus attention on the patient's behaviour and enabled participants to notice subtle features of the conversation that they had previously overlooked:

. . . during the last recording um that we did that stuck in my mind very strongly. Because listening to the recording, um, I could hear I was focused on something else, but actually I missed something that was really good.

(Participant 6 - non-completer, nursing; lines 35-37)

This also provided opportunities for coaching as participant 1 explained:

Listening to a recording was good to help me reflect on what I was saying, how I was saying it. I think Rob was helpful to encourage, when he said that you know, 'Yep that was good' and I think also to be able to then say 'How could you have said this differently?' Um 'How could you change this from a closed question to an open question?'

(Participant 1 – completer, physiotherapy; lines 381-385)

Beyond skill development, participants noted that having scheduled appointments served as motivational prompts, which focused their attention and helped to maintain momentum in their learning:

Um, but the coaching was brilliant, and it kind of re-focused me because you know after, when Rob goes you think about it for a while, but then life takes over and the coaching just kind of re-focused things and certainly personally made me think, 'Oh yeah now I really want to try more on this' and you know practise it and I suppose embed it into my practice.

(Participant 6 - non-completer, nursing; lines 417-421)

Securing recordings of practice

Although listening to recorded practice samples during supervision was valuable, securing the recordings was challenging. Some of the reasons were practical for example, participant 1 described not having enough time to gain informed consent from patients:

. . . giving them the consent form that does take only you know a little bit of time but when you've got pressure on you, you kind of think right okay I'm not going to worry about that . . . so it's more of the service pressures that mean that getting the recording is not so easy.

(Participant 1 – completer, physiotherapy; lines 466-470)

Another participant explained that part of the difficulty has to do with a perception that patients may be reticent about having their consultation recorded:

Because they weren't happy to be there and you're trying to motivate people to do rehab, they're not happy and you're giving them another thing that they have to do, that . . . made it awkward for me to ask them . . .

(Participant 9 – completer, physiotherapy; lines 124-127)

PREAMP manual

The training package that was used during study 2 (learning MI) was refined for successive cohorts. One modification was the introduction of a manual to support training and guide implementation efforts. In the first iteration this was a short summary of key points from the training printed on two sides of A4 sized paper. Following requests from participants this was developed into a more comprehensive manual with a description of each strategy together with sample dialogue (see PREAMP manual Appendix L, page 401). Overall, participants found it a useful adjunct to the training. Several described it as a useful revision tool:

> *Um that was useful because as I say you kind of come away feeling half confident that you've taken everything in, and of course by the time you've got home, two heavy days of learning, so that was good, that was very good to refer back to. I think that's almost invaluable yeah.*
>
> *(Participant 4 – completer, physiotherapy; lines 321-325)*

The sample dialogue was deemed to be particularly useful:

> *. . . there's really nice sentences and ways of saying things and um I found them really helpful.*
>
> *(Participant 8 – completer, physiotherapy; lines 385-386)*

The PREAMP manual did not entirely meet all participants' needs. For example, one physiotherapist who worked within a particularly time-pressured service, struggled to integrate all of the strategies described and felt the manual did not contain sufficient information to guide the adaptation to suit her own style and work context. She explained that it was only after it was adapted through discussion during a coaching session that she felt confident about it:

> *When you're trying to integrate it - it made it more forced than it did come naturally and at one – and until we did that one sheet that we, that I did with Rob - it was very long winded and not very personal to how I do an assessment. So, we re-jigged it so it was something specific to me and I think that was really useful because it was more about how I talk and how I do an assessment.*
>
> *(Participant 9 – completer, physiotherapy; lines 198-201)*

Another participant expressed a similar need to modify the manual. She described adapting the electronic version of the manual to create a briefer document to use as an aide-mémoire within consultations during the early phase of learning:

But it was very useful at the beginning and I used it as, to sort of create a um, oh what do you call it - like a proforma almost, sort of a prompt you know to remember what sort of things and so that was really useful to help, err devise a bit of a structure to how I wanted to approach it so that I didn't go blank with the patients and stuff, so yeah, it was good from that point of view . . .

(Participant 3 – completer, physiotherapy; lines 529-534)

9.4.3.1.2 **Facilitation style**

All training drew on MI as a parallel process, meaning that learning activities were facilitated using the same non-judgmental, collaborative framework that characterises MI. Several participants described valuing the flexibility and choice they were afforded in the focus and design of the skills building exercises used during workshop training. This is captured in the following quote from participant 5:

. . . and he listened to the group – the sort of feeling of the group I think as to whether, whether they wanted to work in pairs or, or do it as a whole or whatever. So, um, yeah, very unthreatening, very supportive in that respect and yes just mixing it up and listening to the group to see how – how they wanted to do it I think, how they wanted to practice it . . .

(Participant 5 - non-completer, physiotherapy; lines 471-475)

Being receptive and responsive to each participant's needs during supervision was also viewed as necessary, particularly in instances where struggles were encountered:

. . . the coaching sessions were definitely, definitely useful, and then when Rob knew I was struggling he broke it down even simpler and basically gave us just like three things to remember . . . he did accommodate that um and that was helpful.

(Participant 4 - completer, physiotherapy; lines 189-193)

The parallel process also involved modelling MI skills such that participants learn from experiencing MI on a personal level. Several commented on the value of this:

I think Rob's coaching style is, is in itself learning, because it's all MI isn't it? You know there's times I just sit there going 'You've just been reflecting [what I was saying/thinking] *. . . . But it's his natural way of doing it so that's even, even like a role play in some respects - you're already kind of listening to the responses you could give in different scenarios, so that's quite good.*

(Participant 7 - non-completer, physiotherapy; lines 361-366)

Whilst all participants described the training process as challenging, the majority felt 'safe' when experimenting with new skills. The provision of a supportive, non-judgmental atmosphere helped to maintain engagement when difficulties were encountered:

> *But I think Rob tries to do it in a way that it's, there's not a pressure on it you know it's not – if you don't feel happy doing it - he's not going to* [say] *'You will do this, keep going - keep going – keep going'. It's a case of okay, more of a 'Think about the way you, how would you ask that question?'*
>
> *(Participant 1 - completer, physiotherapy; lines 420-424)*

Participants' accounts also indicate that this supervisory style encouraged them to remain open and honest when discussing development needs:

> *Rob was very enthusiastic and very supportive through that process which, you know puts you, makes you feel more comfortable and you can be more honest as well.*
>
> *(Participant 8 - completer, physiotherapy; lines 420-422)*

An important element of the supervision was to provide balanced feedback. In addition to highlighting development needs, the goal was to strengthen participants' confidence by reinforcing the progress they were making. Participants seemed to value this particularly given their tendency towards being excessively self-critical:

> *Then he sort of broke it down and when you did actually listen to it you realised that you were trying to incorporate some of the components and it wasn't as bad as I thought, and then he just yeah encouraged all the time and just gave a few pointers which could make it improve for next time.*
>
> *(Participant 4 - completer, physiotherapy; lines 200-203)*

Whilst the efforts that were made to adjust the supervisory style meet each participant's needs were mostly successful, feedback from one participant suggests that was not achieved completely. She explained that whilst on the whole she valued an evocative style and could see the reasoning for it, she sensed that there were missed opportunities for direct feedback:

. . . obviously Rob was not wanting to put us off and keeping us motivated . . . . he was trying to get us to see it ourselves and a lot of the time we probably were doing, so maybe that's why he didn't have to say so much 'cos like we'd know ourselves 'Yeah that didn't go very well' and then we'd just say so what could we do differently next time. And that's great. But I think there's probably times as well that maybe we didn't pick up on it because we're so new to it, but perhaps Rob could say, um a little bit more.

(Participant 3 - completer, physiotherapy; lines 554-569)

9.4.3.2 Environmental enablers

Participants were attempting to integrate MI into clinical practice without any changes having been made to their PR service to facilitate this. As they progressed through training, it became clear that several service-related factors undermined their skill development and integration efforts. The 'Environmental enablers' sub-theme captures the insights provided by participants about the changes to PR services that would be needed to facilitate its integration should it be adopted as part of routine care. It also contains participants' views about the support that clinicians would likely need to maximise their learning and prevent decay in skills over time.

9.4.3.2.1 Service integration

Consultation duration

Independent of the amount of training they had received, participants regarded themselves as 'MI novices' and described their skills as unrefined and inefficient. This was problematic given that there had been no increase in appointment duration to facilitate the integration of MI. When circumstances allowed, some participants would let consultations run over time to enable them to complete a full MI session:

I think if I've done it properly and I have not worried about time, I probably say, it's probably taken me about an hour and half to do all of our assessment including MI, instead of the hour we get.

(Participant 1 - completer, physiotherapy; lines 266-268)

When service restrictions did not permit such flexibility, participants explained that their unrefined skills meant that they would often have to curtail MI before they perceived the full benefit had been realised. One participant described overlooking the evoking process, particularly in those MI-based consultations she was not recording for evaluation purposes. She described adopting its person-centred, collaborative spirit, but not the directive elements aimed at exploring and resolving ambivalence:

> *. . . at times when I'm busy . . . I don't do so much probably the stuff like the scales and you know how motivated are they nought to10, how confident are they nought to 10 . . . . I just sort of like stop it there and get onto the more objective things. Whereas I'm sure I might be able to delve a little bit more if I just carried it on . . .*
>
> *(Participant 3 - completer, physiotherapy; lines 265-270)*

A consensus was that if MI were adopted then independent of the efficiency of their skills, it would be necessary to extend the duration of consultations to support its full and proper integration. Several participants suggested that an ideal scenario would be to offer a dedicated MI session following referral for PR. It was argued that this would provide the protected time to build patient motivation without being distracted by the assessment related tasks that are prioritised in clinical practice and take time away from MI:

> *. . . ideally, I think that you would have a - an appointment at the very beginning with the patient as a one-to-one in which you could use the MI um process of really looking at um how someone's feeling and whether they're they feel ready to commit to the programme and all the rest of it, and allowing you the time to do that. Um and then having the usual pre-assessment bit once they're kind of committed . . .*
>
> *(Participant 8 - completer, physiotherapy; lines 292-297)*

Modifying programme structures

Involvement in the study prompted several participants, particularly those with management responsibilities, to reflect on how programme design and associated consultation structures might be modified to support the integration of MI. Following involvement in the study, one service lead instigated a pilot of a cohort programme. She believed this would provide greater flexibility in the time available for consultations relative to the rolling programmes that normally operate within her service. This participant also noted that at any given time, patients enrolled on cohort programmes will be at the same stage or rehabilitation. She felt this would be advantageous since, relative to rolling programmes, there are more opportunities to follow-up individualised MI delivered prior to rehabilitation with group-based motivational work as the programme unfolds:

> *. . . when you start, you know your first few sessions you can really concentrate, you can do a lot of group about goal setting and um and really sort of key, key that up - keep it going as well.*
>
> *(Participant 5 - non-completer, physiotherapy; lines 406-408)*

Another issue raised was that the amount of MI needed to strengthen motivation and consolidate commitment to PR may vary across patients, which indicates a need for flexibility within appointments. This idea is evidenced in the following quote from a participant who often struggled to integrate sufficient MI within the limited time she had available with patients. She recounted a conversation with her manager who was in a position to make decisions to prioritise MI when it was required and either shorten, delay or reschedule other consultation tasks to accommodate this. This implies that to support integration efforts, it would be helpful if all clinicians delivering MI were afforded the authority to make similar decisions:

> *I mean I was speaking to* [colleague's name removed] *today about my recordings and she did say 'Well, your situation when you're doing your recordings is different to mine because I have a whole hour with somebody and you know I set myself a bit more time to make sure that I have enough time to do it'.*
>
> *(Participant 2 - completer, physiotherapy; lines 110-113)*

Another participant explained that her service conducts group assessments for patients prior to PR, which makes it difficult to have in-depth conversations whilst others are in earshot. It also makes being flexible with timings difficult when patients need more work. Together this implies the need to offer one-to-one appointments:

> *So in a one-to-one consultation you can get there, because it's more private and you're – it's just you two. Whereas if there's other people around, even though they're not in the consultation with you, they're doing other things, I think that it would be more difficult to get that depth of information.*
>
> *(Participant 8 - completer, physiotherapy; lines 232-236)*

The importance of the timing of initial consultations was also raised by several participants. One noted that patients have to wait as much as six weeks to start PR after having had their initial consultation. She explained that this can be problematic since patient's motivation can drop in the intervening period (often because of respiratory infections and increased symptoms). This has implications for the latency between initial assessment and programme start - or points to the need for further contact if there is a delay in starting:

> *'Cos there is a waiting list you see, so how they might feel in their assessment when they actually start the group six weeks later something might have changed in that time.*
>
> *(Participant 2 - completer, physiotherapy; lines 235-237)*

She also explained that frequent contact can be beneficial for patients whilst they are waiting to start the programme or if they have begun, but their attendance has declined:

> *. . . obviously there are people that come in that are super-motivated already um, but then sometimes even those people like drift off . . . . it is hard for them . . . . I think it's just, finding like that connection with them . . . . and just try to keep in touch with people that maybe have dropped off . . .*
>
> *(Participant 2 - completer, physiotherapy; lines 797-813)*

The continuity of care was also deemed important and another suggestion was to organise for the same clinician to facilitate each patient's pre and post PR consultations:

> *. . . we've always said that it's better if we can be the pre-assessors, the ones that run and the post assessors because it's that relationship that really makes* [more of a] *difference really than what you say.*
>
> *(Participant 7 - non-completer, physiotherapy; lines 481-482)*

Addressing the full care pathway

Several participants explained that the successful integration of MI into PR depends in part on the referral process. As participant 1 pointed out, there is often room for improvement with the existing provision. Some patients are reticent about having been referred, but do not feel as if they have any choice about attending for rehabilitation. Others do not know what they have been sent for:

> *. . . they've just been sent by the respiratory nurse or the consultant that this is something they have to do, or they recommend and they haven't really got an idea.*
>
> *(Participant 1 - completer, physiotherapy; lines 127-129)*

Having the referring clinician discuss the demands of the programme at the time of the referral, within an atmosphere of autonomy and choice would likely pre-empt PR clinicians having to devote scarce consultation time with patients who have little or no interest in joining the programme.

Participants also explained that patients are rarely prepared for MI-style conversations. This idea was raised in the sub-theme 'Patient readiness for role change' and implies that it might be easier for PR clinicians to achieve an appropriate depth of conversation if referrers clarify exactly what the intake consultation involves and encourage patients to start thinking about their ambivalence about exercise ahead of their appointment:

Because as well a lot of our patients come in expecting a 5-minute appointment because that's your normal hospital appointment isn't it – we have an hour. They're like . . . . 'How have you got one hour for me?'

(Participant 7 - non-completer, physiotherapy; lines 182-186)

Normalising motivational interviewing

Several organisational and clinician level changes would be required to embed MI into the service and to ensure it becomes a feature of normal practice. In the first theme presented in this chapter (Theme 1: Cultural context) there was a description of the values and priorities that shape the current service provision and provide a challenging environment in which to introduce MI. Participant 3 described how the training she received prompted revised reflections on how care is best delivered. She explained the importance of services eschewing practices such as selective recruitment of patients (see sub-theme: 'Re-evaluation of current culture and traditional practice') and rather, using MI to support patients to make fully informed decisions about whether the programme is right for them:

I think people would have to be more positive and actually see that this is a good thing that we are trying to get more people on board rather than like I talked about in the beginning, [discounting those with motivation issues] *to get the real good ones in.*

(Participant 3 - completer, physiotherapy; lines 364-368)

On a practical level, normalising MI would also necessitate having clear procedures and guidelines that enable it to be integrated with other clinical tasks as part of routine PR consultations:

So, it was important to try and put both assessment and the motivational interviewing assessment together. And I struggled with that for a bit and then Rob and I went through it and made a plan . . . and it was less of a barrier I think to be able to progress with it, I think.

(Participant 9 - completer, physiotherapy; lines 78-83)

A key implementation consideration was ensuring a consistency of approach across team members. Each service lead referred to the importance of training all PR clinicians to facilitate this and there was discussion about the requirement for careful planning, particularly around the training of junior staff. These individuals typically work within a service for a relatively short period (usually 6-months) before rotating to a different service within the organisation as part of their preceptorship. Given the large case-loads junior staff typically carry, the training would need to be arranged as they commence the PR rotation:

I think it is a skill that needs to be learnt um and we have a lot of rotation staff and I think that, that would make it difficult.

(Participant 1 - completer, physiotherapy; lines 174-175)

9.4.3.2.2 **Organisational support for learning**

Protected time

Participants accounts reflected strong feelings about the need for organisations to provide protected time for clinicians to work on their MI skills. One requirement was for appropriately timed supervision meetings. Participants explained that it was important to have enough of a gap between meetings to practice new skills, but they warned that if meetings were not formally scheduled ahead of time, then other responsibilities tended to take over and cause delays. As participant 6 pointed out, this carries potential to undermine the momentum in learning:

Actually I just think if you are going to commit to it, do the training and do the follow-up as soon as you can afterwards because I think if I'd had a big gap, the further it goes away, the less you can recall it and the less, what was said and the role plays um have a sort of impact on helping you change your practice.

(Participant 6 - non-completer, nursing; lines 321-324)

Having protected time outside of formal training activities was also considered important. As participant 2 implied, being able to prepare for supervision and MI-based consultations was valuable:

I mean, during work time I haven't had any time to look through the manual and try to read through and a lot, it would have been good I suppose if I had more time to read up my little notes and things and have my little prompts and that beforehand just to remind me.

(Participant 2 - completer, physiotherapy; lines 364-367)

Similarly, it was considered helpful to have time after supervision to reflect on and consolidate what had been learnt, before trying things out with patients:

So, I think if quite soon after that if there had been a period of recalling it and reflecting on what had been said how it's affected you and how you would change, that would be good . . . . so maybe an hour after each of those one-to-one's with Rob.

(Participant 6 - non-completer, nursing; lines 305-312)

Several participants discussed the importance of having regular opportunities to practise their MI skills between supervision sessions. Some explained that their learning had been interrupted through reduced clinical contact:

> *But I don't know 'cos like I haven't had as much chance as I'd like to have done to practice it anyway because you know my role's been different in the last few months I've been covering a lot of groups and haven't been doing as many assessments.*
>
> *(Participant 2 - completer, physiotherapy; 155-158)*

This was problematic as participant 4 explained, since delays in trying out skills with patients led to forgetting:

> *And it all made perfect sense but it's like everything isn't it you can walk away and think you've got it and you don't practice immediately or all the time and you forget . . .*
>
> *(Participant 4 - completer, physiotherapy; lines 174-175)*

Having sufficient opportunities to practice skills may be particularly challenging for senior clinicians who by virtue of their management responsibilities tend not to see as many patients as other team members. This issue was highlighted by participant 5:

> *So, I don't do very much clinical work which is why I haven't been able to do – and I tend to cover whatever is missing rather than a specific- I don't have a specific clinical input now. Um, I tend to sort of crisis manage around absence really.*
>
> *(Participant 5 - non-completer, physiotherapy; lines 70-73)*

Availability of training expertise

Another consideration is having access to and funding for experts to train team members. Whilst a cascade approach may work for training in other aspects of PR (whereby a small number who attend for formal training go on to deliver similar input for colleagues), two participants explained that this was inappropriate for MI given its complexity. Referring to a colleague who was unable to join the study, one participant said:

> *So there's one thing sort of learning it, but to try and almost then teach a colleague effectively um - in the end we were just like mucking this up really . . . . I think that really every person that's in a pulmonary rehab setting should - would probably need training like we had with a professional, you know with an expert and some regular coaching and stuff . . . . you'd have to have to have a lot of training opportunities.*
>
> *(Participant 3 - completer, physiotherapy; lines 676-685)*

9.5 Discussion

9.5.1 Summary of findings

The overall aim of study 3 was to explore participants' experiences of learning MI and implementing the skills into clinical practice. MI was viewed positively and deemed appropriate and relevant for promoting engagement with PR and encouraging adherence to physical activity recommendations. In general, participants perceived improvements in their skills through training and noticed the positive impact of MI for patients. Learning and applying skills in practice was particularly challenging though, and their perception of progress was not linear. Part of the challenge had to do with the complexity of the method itself, though a lack of time was also considered to undermine full engagement with the training programme and made it difficult to integrate MI into routine care.

9.5.2 A challenging context in which to introduce motivational interviewing

Participant accounts indicated that the PR environment is a particularly challenging context in which to introduce MI. The combination of imposed performance indicators (focused on short-term measures of success) and strict financial control measures make it difficult to justify the time necessary to have in-depth conversations about programme engagement and sustained behaviour change. Moreover, some participants indicated that these conditions have led to inappropriate screening of patients and premature discharge following sub-optimal programme attendance.

Whilst such practices may help to reflect services in a positive light to commissioners on short-term measures of performance, they risk alienating groups of patients who would likely benefit from additional support to encourage programme engagement. Rejecting patients based on low baseline motivation conflicts with the American Thoracic Society/European Respiratory Society statement on PR which states "Importantly, motivation is not a prerequisite to enrolling in pulmonary rehabilitation; rather it is one of its major goals. Increasing motivation and changing cognitions occur simultaneously when individuals experience positive benefits from new adaptive behaviors in an interactive manner" (Spruit et al. 2013b p. e29).

One of the participants who raised this indicated that the differential treatment of patients is normalised and justified on the basis of supporting patient autonomy (avoiding forcing patients perceived to be lacking in motivation to join or continue with the programme against their wishes). Whilst endorsing self-determination and choice are central to autonomy, MI theory would suggest that such decisions should be made on the basis of an appreciation of the

potential benefits of joining (or continuing), in addition to the potential downside. To make informed autonomous decisions following referral, it would appear helpful if patients had the opportunity to discuss their concerns within an empathic, non-judgmental atmosphere. Moreover, it seems that there is value in patients understanding what the treatment involves and the provision of opportunities to discuss how the potential benefits align with their broader health and treatment goals. Exploring how practical and psychological barriers to programme engagement could be addressed should they enrol might also contribute to informed decision making.

In the absence of such a collaborative conversation, denying a patient the right to make their own decisions about their involvement in PR could be experienced as abandonment. It risks triggering a dysfunctional relationship with health services whereby patients only access help when their condition has deteriorated significantly and urgent care is required, rather than as a proactive measure to optimise treatment and protect health. The potential effects are poor symptom management, poor quality of life, worsening condition and increased utilisation of acute healthcare, which come at a high cost to the National Health Service (NHS).

To support implementation efforts should MI be adopted in clinical practice, it would appear advantageous to address the drivers of the current service provision and for this to be paired with increased funding of PR services to enable additional appointment time. This is discussed within the final chapter of this thesis (section 10.4, page 319).

9.5.3 Explanation of study 2 findings

The results of study 2 (learning MI) lend some support to the feasibility of MI and the training package in general, but raised issues relating to sub-optimal skill acquisition and timely completion of the training package. The purpose of the explanatory sequential mixed methods project described in section 5.4.2.2 (page 134) was to use insights derived from participants' accounts of their training experiences to make sense of these key issues and to inform further development of the intervention and associated training ahead of more formal testing.

9.5.3.1 Sub-optimal skill development

Practice samples obtained after all the MI training had been received showed two key shortfalls (see section 8.4.5, page 219). Whilst participants could evoke change talk by asking the 'opening' questions suggested within the PREAMP manual, they found responding contingently and developing the conversation beyond that challenging. This likely explains why change talk often remained underdeveloped and practice samples showed insufficient evidence of

ambivalence having been resolved. The second, related issue, was a failure to achieve basic competency in the relative frequency and depth of reflective listening.

Participants' accounts suggest that some of the challenge had to do with difficulties embracing the humanistic perspective that underpins MI. As described in section 3.6.1 (page 34), MI practice is guided by the assumption that humans have tremendous wisdom about themselves and tend to move in the direction of positive change when provided with an empathic, non-judgmental therapeutic atmosphere (Rogers 1959, 1980). This 'competence worldview' is at odds with the deficit philosophy underlying these clinicians' normal practice, which typically involves assessing, educating and advising (see sub-theme 'Professional background').

Practicing MI effectively, therefore, involved a cognitive shift in how patients are viewed and about the type of support that will be most helpful for encouraging change. The sub-theme 'Acquiring and refining new skills and attitudes' highlighted that participants perceived some movement in this regard, which gave rise to an enhanced interest in the patient's perspective about change. There was a tendency to resort to clinician-centred practices, however, which undermined the depth of conversation and suggested that participants were not yet fully invested in the competence worldview. The likelihood of this increased when patients were particularly ambivalent about change and expressed reservations about joining PR. These circumstances gave rise to uncertainty about how conversations would unfold and whether patients would commit to the programme (see sub-theme 'Committing to uncertainty'). Such ambiguity was problematic because it undermined the feeling of control these clinicians normally experience when talking with patients (see sub-theme 'Destabilising experience'). Relatedly, since participants had yet to relinquish the idea that the responsibility for change rests with them, they experienced patients' uncertainty about PR as a personal failing, perceiving that they had not done a good enough job convincing them about its merits (see sub-theme 'Redefining success').

Becoming anxious about the prospect of ambiguity can be quite disabling from an MI skill perspective. This is because effective practice involves being open-minded about what the patient brings to the discussion and an ability to focus on their experience without being distracted by one's own thoughts and needs (Miller and Rollnick 2013). Those who experience ambiguity as more threatening will be less inclined to use reflective listening to demonstrate understanding and acceptance of the patient's perspective, which in turn, will likely undermine the exploration and resolution of ambivalence. Instead they may rush toward finding a resolution that triggers change as a way of coping, especially if they believe they know what is best for the patient and time is limited. Another possible explanation is that participants

resorted to 'clinician-centred' practices when they experienced anxiety about where to take the conversation when patients felt immobilised by their ambivalence.

The strength of participants' convictions regarding the humanistic perspective were similarly tested when they encountered patients who appeared reluctant to assume an active role in the relationship and expected to be told what to do (see sub-theme 'Patient readiness for role change'). An appropriate MI response would be to remain curious about the patient's thoughts and feelings and if necessary, discuss the rationale for placing their ideas at the centre of the conversation. Yet, it seemed that participant's own unresolved ambivalence regarding patients' capacity for change resulted in their reverting to a familiar expert-stance.

Another part of the barrier to deepening the conversation related to concerns about patients raising emotive issues. This potential was raised in study 1 (clinician views), in which it was suggested that in normal (non-MI) practice, clinicians use closed questions to keep control over the direction of the conversation, thus preventing it from straying into the less familiar and possibly less comfortable psychosocial domain, which they felt ill-equipped to handle. That clinicians without psychology backgrounds feel unprepared for dealing with COPD patients' emotion reactions when discussing issues relating to self-management has been reported by others (Blackmore et al. 2017). It has also been raised that some health professionals are concerned about overstepping professional boundaries if they continue to listen when patients disclose sensitive information or express strong emotions (Graves et al. 2016).

The declarative-procedural-reflective (DPR) model implies that many of the difficulties associated with developing MI conversations derive from the self-schema. Bennett-Levy and Thwaites' (2007 p. 268) conceptualisation of interpersonal difficulties was applied to the current situation. The sub-theme 'Managing difficult feelings' revealed how several participants found it upsetting to witness patients emote as they confronted the reality of their situation and their choices (self-schema - emotion activation). Concern was also expressed about potential damaging effects if they prolonged patients' exposure to negative emotions through MI principles such as developing discrepancy (therapist belief/assumption derived from self-schema). These concerns were reinforced by beliefs about their role in protecting patients from uncomfortable feelings and doing no harm (self-schema-rule translated into therapist attitudes/belief). Consequently, some participants avoided potentially emotive subjects or would curtail conversations as soon as negative emotions surfaced.

Resolving ambivalence, however, often requires patients to explore deeply held values, work through internal conflicts and confront "painful realities" (Arkowitz et al. 2015 p. 371). Therefore, avoiding potentially emotive topics or withdrawing prematurely when patients become distressed can be problematic if it deprives them of the opportunity to work through issues that

undermine change. As Bennett-Levy and Thwaites (2007, p268) argue, this implies the need for specific help during supervision to explore the origins of these feelings and to develop and test out more adaptive rules.

Participant accounts suggest that difficulties with the depth of conversation and reflective listening might also be traced to limitations of working memory (see sub-theme 'Cognitive burden'). As novices, much of the challenge of MI resulted from having to divide finite attentional resource between the different elements of practice. Achieving an appropriate depth of conversation involves attuning to the patient and assessing on a moment-to-moment basis what they are meaning and experiencing (interpersonal perceptual skills). There is a need to respond in a way that demonstrates understanding and acceptance of their perspective about change (interpersonal relational skills), whilst subtly directing the conversation to facilitate the exploration and resolution of ambivalence (technical skills). At the same time, there is a requirement to reflect on the overall trajectory of the conversation (conceptual skills), to know what to listen for (when-then, rules, plans procedures and skills) and to be mindful of how personal attitudes, beliefs and assumptions might influence the interaction (therapist attitudes). Supressing habits that are incompatible with MI and preventing one's own agenda and preconceptions from interfering are also necessary tasks that demand attentional resource.

In contrast to 'experts' who have automated many of the skills and can use different elements of the procedural system in parallel (Bennett-Levy 2006), participants were forced to select which element to focus on, as the in-session demand to use them all simultaneously overwhelmed their working memory. As participants themselves admitted, there was a tendency to focus attention internally (on what they should say next to progress through the steps outlined in the PREAMP manual). This was at the cost of the other elements such as using interpersonal perceptual skills to attend to the patient's experience and giving sufficient attention to their motivations, which would have led to deeper, more meaningful conversations. In this sense, the explanations and sample dialogue contained within the PREAMP manual may have been excessively detailed and contributed to the problem. Participants may have been better served had the manual focused more on the spirit of MI and its underlying principles to support the integration of key skills in practice and adaption based on the patient's response. The varied feedback about the manual suggests that for some at least, this would have been helpful (see sub-theme 'Strategies, activities and content').

The introduction of training exercises designed to deconstruct the skill of reflective listening into its constituent parts to reduce the cognitive demand (see Table 7-2, page 184) helped participants to develop their skills progressively outside of clinical consultations. This provides support for the idea that some of the difficulty experienced in this domain was the result of

working memory overload. It may take more time to develop fluency with basic MI skills such they become automatic and enable clinicians to concentrate of different elements of practice simultaneously.

Other insights provided by the DPR model relating to the maturity of the procedural system may help to explain the difficulty participants had achieving an appropriate depth of discussion. The ability to conceptualise a patient's ambivalence efficiently and arrange the conversation in a way that leads to its resolution are facets of more advanced practice that may be contingent on the presence of a sophisticated set of 'when-then-rules, plans, procedures and skills'. According to Bennett-Levy (2006), these are refined, integrated skills that evolve once basic techniques have been mastered as clinicians reflect on challenging consultations (through self-reflection or during supervision). Such reflections give rise to progressively "finer differentiations between different situations and circumstances in therapy" (Bennett-Levy 2006 p. 68).

When-then rules denote which skills, used in what particular way would be most effective to address the issue in hand. For example, *when* a patient referred for PR has low outcome expectations for exercise, *then* invite them to describe how their activity patterns have changed since diagnosis (avoiding impulse to assess how much they do), demonstrate understanding and acceptance, and then use neutral information exchange to sensitively reframe their day-to-day difficulties and declining function as a recognisable and understandable problem, which can be addressed by PR.[40] The DPR model also suggests that when-then rules guide the use of interpersonal perceptual skills. In this case a clinician would be sensitised to subtle features of the patient's reaction that imply a need for reflective listening or reinforcement of autonomy and choice to pre-empt defensiveness and discord.

If achieving the requisite depth of discussion rests on the clinician first having developed and refined a set of when-then rules, then this lends weight to the conclusion that more time and more supervision is required for skill development than was afforded in the training study.

9.5.3.2 Engagement with training

Participant feedback gathered during study 2 (learning MI) revealed the existence of both practical and psychological barriers to timely completion of the training programme. Progression was interrupted primarily by delays submitting practice samples for assessment and feedback purposes, which participants said resulted from having insufficient time within

[40] See issue described by participant 3 within section 9.4.2.2.4 'Destabilising experience/distance from desired practice'.

consultations to practice MI. When designing study 2 (learning MI), the author had assumed that it would be possible to integrate what had been taught into routine consultations without the need to extend appointment duration. This was not always realistic, however, as time-pressures and other priorities left little opportunity to discuss programme engagement and adherence issues (see sub-theme 'Conflicting cultures'). The difficulty of implementing MI into routine appointments was compounded by the inefficiency of these novices' skills and misconceptions about the need to follow the entire sequence of strategies highlighted in the PREAMP manual.

Service pressures also meant that participants had insufficient protected time to engage fully with learning activities beyond the initial 2-day workshop, hampering attempts to review and reflect on completed consultations and arrange timely supervision sessions. That service design and lack of resources limit training opportunities and can make it difficult to implement patient-centred interventions in COPD has been reported by Lundell et al. (2017). Stahl and Gustavsson (2018) also identified competing initiatives and high workload as key barriers to skill development and use of MI in a return to work context.

Concerns about having MI practice evaluated also contributed to the delays, with participants keen to only submit recordings that demonstrated their best performance (see sub-theme **'**Performance anxiety'). Some felt quite vulnerable about this element of training, especially as they considered motivating patients to be an essential element of their role (see sub-theme 'Destabilising experience'). Consequently, they would wait to record a consultation with a patient who they anticipated would be amenable to MI, rather than one with a complicated history or whose reservations about PR might make it more difficult to demonstrate their skills. Some withheld recorded consultations that they believed on reflection did not evidence what they knew they were capable of. Such reluctance to submit practice samples over fears of negative feedback has been raised by others (Channon et al. 2016). Johnston and Milne (2012) have reported that this sense of vulnerability and anxiety may be particularly high when those learning cognitive-behavioural therapy are at a developmental stage they termed 'uncomfortable recognition of relative incompetence' (which parallels the 'distance from desired practice' component of the 'Destabilising' sub-theme in the present study). The authors noted that this developmental context implies a need for careful supervision to maintain trust and engagement with training activities.

A higher than expected proportion of study 2 participants did not complete the training package (n=12; 50%). Whilst none of the reasons given at the time of withdrawal related to poor acceptability of MI, the justifications were vulnerable to social desirability bias, a point first raised in section 8.5.2 (page 223). It is possible that at least some of the reason had to do with

difficulties acquiring and implementing the skills (see potential pathway illustrated in Figure 9-2, page 293).

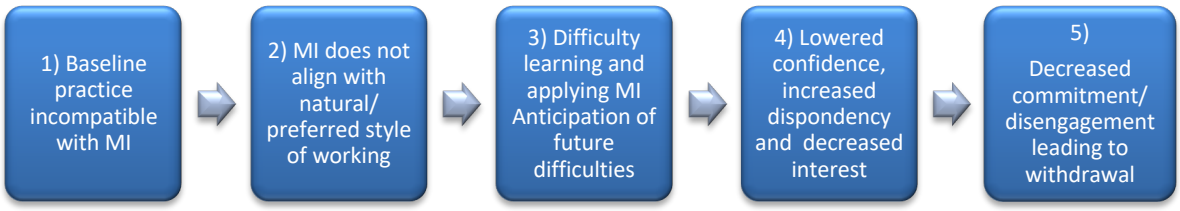


Figure 9-2. Theoretical pathway from experiencing difficulty learning and implementing motivational interviewing (MI) to disengagement from training and withdrawal. Informed by "Unintended effects of training on clinicians' interest, confidence, and commitment in using motivational interviewing" by SE Decker and S Martino (2013). *Drug and Alcohol Dependence* 132(3): 681-687.

As described in section 8.4.2.1 (page 206), most who withdrew were senior clinicians whose baseline practice was most out of keeping with the spirit of MI (higher MI-non adherent behaviours and a tendency toward lower empathy). Compared with study completers, MI represented more of a change to normal practice for these individuals. It is possible therefore, that they encountered more difficulties during training and when trying out skills with patients. Feedback provided by two service leads (captured within the sub-theme 'Professional background') lends support for the link between baseline skills and the ease of learning MI. One (who withdrew prematurely herself) reasoned that clinician's level of experience with using methods that are conceptually opposed to MI makes it harder to adjust to it. A second argued that some of her team may be reluctant to invest the effort required to learn MI because the style does not align with their natural or preferred orientation.

Bennett-Levy and Thwaites (2007) argue that developing interpersonal skills as part of training in psychological interventions (such as MI) is challenging for clinicians on a personal level. This is because the elements that underpin effective practice (perceptual and interpersonal relational skills together with facilitative attitudes, beliefs and assumptions) all draw heavily on the self-schema. They argue that this explains why difficulties associated with these skills tend to be "emotionally sensitive and personally felt" (p.264) and require careful supervision.

The difficulties experienced by those who withdrew could have led to a reduction in interest and commitment and increased the risk of withdrawal. This idea remains speculative, since this study relied on a convenience sample and most of those best placed to give insights about the

decision to withdraw from study 2 (learning MI) did not participate.[41] MI training research in other contexts, however, lends some support for this idea. In a training study involving substance use clinicians, Decker and Martino (2013) reported overall negative shifts in attitudes towards MI through training, but the extent of decline varied as a function of trainees' initial attitudes. Those who started out with low interest, confidence and commitment experienced sharp drops in each of these variables. By contrast, those with high initial interest maintained their interest and reported only small decreases in confidence and commitment over time.

Independent of any relationship between difficulties learning MI and risk of withdrawal, a consistent theme in participant feedback was that in the early stages of learning MI, practice felt awkward and resulted in their feeling less expert and in control then they were used to. This mirrors the experiences of other groups of health professionals whilst training in MI (for example Wallace 2011) and psychological interventions more broadly (Wilson et al. 2015a) and raises the question about how best to encourage learners to persist in the face of difficulties without resorting to old ways of working and disengaging from training.

One key insight gained from this research was the importance of a parallel process, whereby the style of MI was used to create a non-judgmental supportive environment in which difficulties were addressed (see sub-theme 'Facilitation style'). This may be essential for continued engagement, particularly where those challenges exist in the interpersonal domain.

9.5.4 **Reflection on the overall effects of training**

Given that the training package used in study 2 was developed with an appreciation of the challenges hypothesised by the DPR model and knowledge of the limitations highlighted by previous research (including study 1: clinician views), an important question is why it did not yield superior results? Several possibilities exist:

1) A ceiling effect exists, and clinicians realised their MI potential;

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[41] Eight of the nine participants interviewed as part of study 3 (trainee experiences) had completed most or all of the training package, which means only one participant to whom this idea relates was interviewed.

Ignoring the 6 participants whose withdrawal from study 2 (learning MI) was deemed unavoidable (rotating out of the PR service during the study, n=2; illness prior to the initial workshop, n=1; maternity leave; n=1; temporary suspension of PR service, n=1; retirement following a change in organisational structures, n=1) there were five participants who withdrew from study 2 who did not give in-depth feedback about their experiences. Four of these were not eligible to participate in study 3 having been trained in one of the early cohorts before the follow-up study had been conceived (see section 9.3.2.1). The other withdrew following a change in focus of her role to complex case reviews and oxygen service without submitting a post-workshop practice sample and elected not to participate in the follow-up interview.

2) The training package did not provide sufficient training or the right type of support to address PR clinicians' learning needs. This may be because the basic assumptions of DPR model that were used to guide training efforts are incorrect, are not relevant to MI training for PR clinicians, or that the training activities developed by the author were not effective in addressing the learning challenges predicted by the model;
3) The study duration was insufficient and a longer observation period (without additional training input necessarily) would have allowed participants to embed and refine their skills;
4) Participants were working within an environment that was not conducive to learning MI, with insufficient opportunity within appointments to experiment with skills and insufficient protected time to engage fully with the training programme.

It is not possible to conclude from this research but likely that it is some combination.

9.5.5 **Implications for future research**

In addition to providing explanations for key findings from the training study that preceded it, study 3 has provided important insights that will be helpful for further refinement of the MI intervention and associated training package ahead of further testing. These are summarised in Table 9-4 (page 296).

A key element of these recommendations is the selective recruitment of clinicians for MI training and delivery on the basis of their stated interest in MI and the presence of foundational skills that have been shown to predict response to MI training. Some study 3 participants deemed consistency of approach an important facet of service provision and advocated that all team members receive training in MI. This research has shown however, that PR clinicians vary in how well they take to the method and the speed and extent to which they develop skill. There are also indications that clinicians vary in how interested they are in learning MI. Service wide introduction would require mandated training, which is antithetical to the spirit of MI and as several authors have argued, may not represent a cost-effective efficient means of introducing the method into practice (Carroll 2016; Hall et al. 2016; Miller and Moyers 2016). A better proposition might be to invest training resource in those who express interest in learning MI and already have compatible skills such as accurate empathy. This approach was adopted by Miller et al. (2005) to maximise the efficiency of the training process ahead of a large multi-site randomised controlled trial (RCT) in which MI formed part of a combined behavioural intervention.

In light of the varied response to training, a sensible approach would be to adopt the stepwise training model used by Martino et al. (2011), whereby input is extended or curtailed for individuals based on their initial response to training and achievement of basic competency.

Table 9-4 *Insights from Study 3 for Motivational Interviewing (MI) Intervention Design, Training and Delivery*

Recommendation	Detail
Service level	
Revise consultation structures to be more permissive of MI	Provide additional time within intake appointment for MI, particularly at the early stages of learning while clinicians' skills are inefficient. Minimise time between initial appointment and programme start to pre-empt decay in patient motivation. Provide opportunities for telephone contact where this is not possible. Consider the use of dedicated MI engagement sessions to protect time for discussing engagement and adherence issues without the distraction of other clinical tasks. This may reduce the demand for clinician skill by removing the need to switch communication styles within a single appointment. Provide adequate time for subsequent appointments to enhance engagement and prevent withdrawal during PR and to prevent relapse after PR has ended.
Intervention design	
Address the full care pathway	Ensure referring clinicians i) accurately describe the content, demands and benefits of PR to patients, ii) express interest in the patient's perspective about being referred within an atmosphere of autonomy and choice, and iii) prepare patients to explore any ambivalence about PR by explaining the focus and spirit of the MI component of the intake appointment.
Interventionist selection	
Selectively recruit clinicians for MI training and delivery	Carefully consider suitable clinicians based on interest and MI compatible skills to maximise training completion and pre-empt overburdening already busy senior clinicians.
Interventionist training	
Adopt stepwise training model	Variable response to training implies need for stepped training model whereby training is expanded/curtailed based on initial response to the training package[a].

Recommendation	Detail
Make further refinements to training package to address the specific issues highlighted in study 3	DPR informed refinements made to training package (outlined in section 7.3.2, page183) were well received by learners from latter cohorts during study 2. Insights from study 3 provide support for the way in which learning challenges were conceptualised and the specific focus and nature of the refinements. Make further refinements to address issues highlighted in study 3 for example attitudes, beliefs and assumptions that derive from the self-schema, which undermine the exploration and resolution of ambivalence.
Provide sufficient protected time for training	To enable full engagement with training and timely completion. Carefully plan early training for junior rotational staff, particularly as they undertake a large portion of consultations.
Emphasise spirit and flexibility of approach	Modify PREAMP manual to place greater emphasis on spirit and overall aims to enable enhanced flexibility.

Notes. PREAMP = Promoting exercise adherence by blending motivational interviewing with pulmonary rehabilitation intervention manual developed for study 2.
[a] Idea based on "A criterion-based stepwise approach for training counselors in motivational interviewing" by S Martino, M Canning-Ball, KM Carroll and BJ Rounsaville (2011). *Journal of Substance Abuse Treatment* 40(4): 357-365.

9.5.6 Strengths and limitations of study 3

This study represented the qualitative follow-up within the explanatory sequential mixed methods project (see section 5.4.2.2, page 134). It has been recommended that initial quantitative findings in explanatory sequential designs are used to plan which participants should be involved in the qualitative follow-up (Creswell and Plano Clark 2018). In the context of this research, purposive sampling might have been used to ensure a range of views are captured based on differing response to training, professional background and level of seniority within the organisation. This was not feasible however, given that only 13 of the 24 participants from study 2 (learning MI) were eligible to participate in the follow-up interview (see section 9.3.2.1, page 242 for an explanation). It was therefore deemed necessary to invite all to participate. The convenience sample contained participants occupying different roles within organisation but was limited in that only one nurse of the six who participated in study 2 (learning MI) was interviewed. This may be significant given that a clinician's professional background may influence their perceptions of MI and skill acquisition. A further limitation is that those who withdrew from the study shortly after the initial workshop were not well represented. This was problematic given the importance of understanding these clinicians' perspectives on their experience and how best to promote ongoing engagement with training.

Participants were aware that the author who facilitated all the MI training would also be involved in the analysis of interview data. Those holding more negative perceptions may have been reluctant to participate for fear of causing offence or personal embarrassment. Similarly, those who did participate may have felt inclined to share only positive perceptions. Whilst an independent researcher was used to collect the interview data, this does not eliminate the risk of social desirability bias.

The author is mindful that his interpretations and analysis will likely have been influenced by his knowledge of the MI training literature and in particular the DPR model. It is also possible that his intrinsic involvement in the design and delivery of the training package and interest in the feasibility of MI may have biased his interpretations toward favourable opinions, and those which were complimentary of his input and which endorsed the approach. To mitigate this risk, the author engaged in on-going reflexive dialogue with a member of his PhD advisory team who also interviewed participants (Rachael Summers). This process helped to ensure adherence to analytical method and safeguard against biases in interpretation of the interview data. The provision of an audit trail (see Appendix P, page 441) which includes critical accounts of the author's interpretations and acknowledgment of the impact of any biases on the judgments that were made allows the reader to follow his analysis.

9.6 Conclusion

This study examined the MI learning and implementation experiences of a sample of participants who had received training as part of study 2. Overall, participants held positive perceptions of the training they received. They noticed improvements in MI skill over time, which increased their confidence and reinforced positive perceptions of the value of MI for addressing engagement and adherence issues within PR.

Participants reported that MI is difficult to implement as intended for two principle reasons. Firstly, the PR environment provides a challenging context in which to deliver MI. Financial limitations means that services have to prioritise what they do. The time available for negotiating sustained behaviour change with patients is compromised, as short-term measures of impact such as patient throughput that are perceived to be important to commissioners tend to be prioritised in practice. Secondly, there is a disconnect between the style of working and focus of MI and the approaches that PR clinicians are used to and feel comfortable with. Learning MI was perceived to be challenging and adjusting to this novel style of working involved shifts in attitudes, beliefs, assumptions in addition to acquiring new knowledge and skills. As participants noted, this takes time and careful training to achieve, and at the novice stage of learning can result in their feeling destabilised and frustrated.

These insights helped to make sense of the difficulties that participants experienced with reflective listening and achieving the depth of conversation advocated in the PREAMP intervention manual. They may also explain the slower than expected progression through training and why some participants withdrew before completing the training package. Some elements of the training package used within study 2 (leaning MI) were modified for successive cohorts based on participant feedback and the author's training observations (see Table 7-2, page 184). The DPR model was used to guide the refinements, which were well received by learners. Insights from study 3 provide support for the way in which learning challenges were conceptualised and the specific focus and nature of the changes. The need for further refinements, for example to better address attitudes, beliefs and assumptions that undermine the depth with which ambivalence is explored, was highlighted.

To support the future integration of MI into practice a stepwise training model is recommended whereby training continues until basic competency is achieved. This research also highlights the need for additional time within appointments to allow for the integration of MI.

A summary of the answers to the research questions that were addressed by study 3 (trainee experiences) is provided in Table 9-5.

Table 9-5 *Study 3: Summary of Research Questions and Answers*

Research question	Answer	Supporting evidence location
1) What were participants' experiences of learning MI and integrating the skills in clinical practice?	They considered it challenging to learn and apply the skills. Over time it became more comfortable and improvements were noticed.	See section 9.4.2 (page 255) and section 9.5.3.1 (page 287)
2) What areas of training/support were perceived to facilitate and/or hinder MI skill acquisition and adherence in practice?	Supervision deemed vital for learning and represented a cue to maintain effort. Use of MI as a supervisory style to model skills and create a safe learning environment was valued. Overall, PREAMP manual was useful, but some perceived a need for adaptation.	See section 9.4.3.1 (page 271)

Research question	Answer	Supporting evidence location
3) How did personal, service and PR programme issues influence the integration of MI in clinical practice?	Time pressured services that prioritise measures of short-term impact such as patient throughput offer little opportunity to discuss PR engagement and adherence issues. Integration of MI is reliant on additional consultation time and learning support. MI antithetical to normal style of working. Adjusting to MI involved shifts in attitudes, beliefs, assumptions and skills.	See section 9.4.1 (page 250) and section 9.4.3.2 (page279)
4) What factors influenced the rate and extent to which participants progressed through the training package?	Service pressures left insufficient time to prepare for and attend supervision sessions and practice MI with patients. Securing consent from an appropriate patient to record practice samples and concern about exposing practice for evaluation purposes delayed submission. Difficulty learning and applying MI and anticipation of future difficulties may have undermined progress and led to withdrawal.	See section 9.5.3.2 (page 291)

Note. MI = motivational interviewing; PREAMP = Promoting exercise adherence by blending motivational interviewing with pulmonary rehabilitation intervention manual developed for study 2.

In this chapter the third study in this programme of research was presented. This final study explored the training experiences and insights of participants involved in study 2 (learning MI). In the next chapter there is an overall summary of the research contained within this thesis in relation to the overarching aim and research questions. This is followed by a discussion of its impact and implications for future research.

Chapter 10: Overall summary and conclusions

10.1 Introduction

This chapter draws together the knowledge and insights gained throughout this thesis and puts the findings in context of current and future clinical practice. Initially there is a summary of the findings in relation to the overarching aim and research questions. This is followed by a consideration of the impact of the research, and a discussion of the implications for future studies.

10.2 Summary of findings in relation to the overarching research questions

The overarching aim of the programme of research contained within this thesis was to explore the feasibility of motivational interviewing (MI) used as an adjunct to pulmonary rehabilitation (PR) for promoting engagement and adherence to physical activity recommendations. The writing in this section summarises the findings in relation to each of the research questions that it sought to answer. The key points are represented in Table 10-1 (page 307).

1) Do respiratory clinicians believe that MI is feasible and an acceptable adjunct to PR to enhance engagement and adherence to physical activity recommendations?

There is clear evidence across the three studies reported within this thesis that clinicians perceived MI to be appropriate and relevant for addressing engagement and adherence issues as part of PR. In study 1 (clinician views) positive views were expressed following a brief introductory workshop about the potential of MI. Those who experimented with the skills when they returned to clinical practice were encouraged by the responsiveness of their patients and the overall impact of the approach: it made sense to them. Through more involved training as part of study 2 (learning MI), gradual improvements in skill reinforced positive perceptions of MI. This provided impetus for most participants to continue to invest effort in the face of challenging consultations and to find time for MI, even when the service environment made it difficult for them to do so. The issue of acceptability was raised again in study 3 (trainee experiences) where participants described MI as superior to their normal approach to motivating patients. It was because of this favourable comparison that participants felt destabilised when they perceived discrepancies between their actual and desired MI performance. This endorsement is captured in the feedback provided by a participant from

study 1 who expressed real concern that through tiredness she might cease to use her newfound skills and relapse back to her previous way of working.

The issue of whether it is feasible to use MI as an adjunct to PR is less clear. While a proportion of practice samples obtained through study 2 (learning MI) provide evidence of participants' ability to provide MI skilfully as part of PR, the research has highlighted several feasibility issues that need to be addressed prior to further research testing the effectiveness of MI combined with PR, and dissemination into practice.

Firstly, the focus and design of PR services provides a challenging context in which to introduce MI. The focus on patient throughput and short-term measures of performance leaves little time to prepare patients for the rigours of the programme and strengthen their motivation for sustained behaviour change. Time pressures created by appointments in which multiple clinical tasks compete for limited contact time were distracting. They undermined participants' attempts to listen deeply to patients and made it difficult to achieve the necessary depth of conversation to demonstrably increase their commitment to change.

This research has highlighted the existence of selective recruitment of patients and early discharge based on sub-optimal attendance within some organisations. These strategies represent one way to optimise attendance and completion rates in the face of limited patient contact time. Whilst this may serve to reflect services in a positive light to commissioners, it comes at the cost of undermining patient empowerment and choice, and conflicts at a fundamental level with MI's humanistic underpinnings.

Based on the findings of this research, several changes would be required to support the integration of MI into routine practice were it to be adopted. Chief amongst would be to reprioritise processes around the individual needs of patients. This would necessitate an increase in appointment time to talk with patients about engagement and adherence issues. This in turn would require increased investment from Clinical Commissioning Groups (CCGs) who purchase services. The need for research to test whether use of MI as an adjunct to PR is cost effective is discussed further within section 10.4 (page 319).

2) Is a tailored MI training package for PR clinicians feasible?

There was mixed evidence for the feasibility of the training package. Overall, it took longer than expected for participants to complete each training activity delivered as part of study 2 and several withdrew prematurely. Service issues rather than negative perceptions of MI and the training intervention itself were cited as reasons at the time, although as reported in section 8.4.2.1 (page 206), most who withdrew prior to completing the training package were senior clinicians whose baseline practice contained a higher frequency of MI-non adherent behaviour

and lower empathy relative to others in the sample. It was hypothesised in section 8.5.2 (page 223) that those who struggled may have been those who experienced the greatest difficulties adjusting to this approach and acquiring the constituent skills. Evidence from study 3 in which clinicians' training experiences were gathered lend some support for this idea (see section 9.5.3.2, page 291).

It is noteworthy that study 2 participants were working within time-pressured services with little or no protected time available to support their full engagement with training. To make the most of training input, participants were encouraged to arrange regular supervision meetings spaced appropriately to maximise momentum in learning and spend time preparing and reflecting on what they had learnt. This was excessively burdensome particularly for senior clinicians given the need to balance training with non-clinical management responsibilities.

Delays in training have important feasibility implications. Junior staff members are key to programme delivery, but many are employed on a rotational contract, working within a service for a short period before moving to gain experience in a different area of practice. Training therefore would need to be carefully planned for these individuals to ensure it is delivered in a timely way. Senior clinicians may require additional protected time given their experience with methods that are antithetical to MI. If MI were adopted by a service, these individuals would likely have a pivotal role in modelling good practice and encouraging sustained effort from team members, so it becomes normalised in practice. It seems important therefore that they receive the right type and amount of support such that they embrace MI.

It was beyond the scope of the study to complete a formal cost-effectiveness analysis of the training intervention. The time involved in the delivery of training (337-hours) and time invested by participants (393-hours) seems high considering the variable skill acquisition demonstrated across the sample (see breakdown of time shown in Appendix N, page 435). This low return for such a high investment underscores the importance of making organisational changes to maximise the benefit obtained.

3) Does the training package lead to basic competency in MI?

The training package led to incremental increases in most components of skill assessed by the Motivational Interviewing Treatment Integrity (MITI) coding system. By the 4-month follow-up, when participants had completed all elements of training package, mean scores for MI spirit and the average of the global ratings had surpassed thresholds for basic competency with eight of 12 study completers achieving each of these standards. Mean values for percent MI-adherent behaviour and the percent open-ended questions approached basic competency with nine of

11 and six of 12 participants achieving the respective thresholds. Participants found it more difficult to achieve the relative frequency and depth of reflective listening advocated by MI.

It is recognised that these results reflect the achievement of those participants who completed training, who may be the most motivated sub-set and who found learning MI to be straightforward. Whether other participants would have achieved such levels had they completed the training package is not known.

4) What are PR clinicians' experiences of learning MI and using it as an adjunct to PR?

The process of learning MI and applying the skills in clinical practice was considered challenging. Feedback gathered through study 3 indicated that the underlying style and skills involved are at odds with the approach participants are used to and feel comfortable with. Delivering MI effectively necessitated fundamental shifts in attitudes, beliefs and assumptions about patients and the clinician's role in supporting change. Participants noticed some changes in this respect, which in gave rise to an enhanced interest in patients' motivation for change. For the two participants who described and gave a rationale for the selective recruitment of patients for PR and early discharge following sub-optimal attendance, exposure to MI training provoked revised reflections on the desirability of such practices, and made salient previously latent attitudes about their dysfunctional nature.

Understandably, at this early stage in learning, participants had yet to embrace fully MI's humanistic spirit. Some experienced cognitive and emotional difficulties as they attempted to use the skills with patients. One such difficulty related to the prospect of handing more control to patients with regard to the direction and content of consultations. Relative to traditional consultations, MI encourages patients to explore issues that are important to them, and to consider their thoughts and feelings in more depth. Difficulties were particularly evident in consultations involving patients who were ambivalent about increasing physical activity, and had reservations about joining PR. Participants described feeling challenged by the uncertainty about how such conversations would unfold and what, if any, decisions would be made. Moreover, since they had yet to surrender the idea that responsibility for change rests with them, they experienced patients' reticence as a personal failing.

Participants' discomfort with uncertainty meant that they often struggled to place the patient's own ideas at the centre of the discussion and actively encourage their involvement in decision making. It sometimes detracted from their ability to demonstrate understanding and acceptance of the patient's perspective and enhance their perception of autonomy and control. On these occasions, participants resorted to familiar practices including educating and advising as a means of coping, especially when time was a concern and they were unsure about where to

take the conversation in an MI-consistent way. This pattern was also evident in circumstances where patients were expecting their clinician to tell them what to do and were not ready to take a more active role in decision making.

Another challenging aspect of MI related to concerns about patients raising emotive issues that participants felt ill equipped to handle. There was some evidence that this concern undermined attempts to deepen the conversation. For example, some expressed a reluctance to develop discrepancy over fears that confronting reality and their choices may be too uncomfortable for patients and may be harmful.

Beyond the underlying spirit, use of MI's constituent skills and strategies were considered challenging. This is because, as novices, they had yet to automate and refine these things. Always being mindful of the need to resist the righting reflex added to the cognitive burden. Since the in-session demand to use all aspects simultaneously overwhelmed their working memory, participants were forced to select which elements to use. A tendency was to focus on their own behaviour (what to say next) at the expense of tuning into the patient's experience, demonstrating empathy and monitoring the overall trajectory of the conversation.

This research has highlighted that the early stages of learning and implementing MI is characterised by feeling destabilised. This was a manifestation of perceiving MI to be superior to traditional practice whilst simultaneously recognising a gap between actual and desired skills. Participants' practice felt awkward and mechanistic initially and many described occasions where they felt lost, unaware of how to progress the conversation. This was considered particularly problematic in the context of a time-pressured work environment in which efficiency is prized. Performance anxiety was common, and participants expressed concerns about exposing skills deficits to patients and submitting samples of their practice for evaluation as part of the study.

Whilst the early phases of learning were considered particularly challenging, participants noted improvements in their skills and confidence over time, which reinforced positive perceptions of MI. These improvements are evidenced in the incremental improvements in MITI scores observed as participants progressed through training and are reinforced in the feedback provided to the author during supervision sessions and through study 3 (trainee experiences).

Perceptions of progress were not linear, however. Difficult consultations and supervision sessions often increased participants' awareness of the complexity of MI, which carried potential to undermine their sense of competence and confidence. For those whose natural or preferred style of working was most out of keeping with MI, difficulties learning and applying MI coupled

with the anticipation of future difficulties left them feeling despondent. This may have led to decreased commitment, disengagement and ultimately to their withdrawal from training.

Overall, the training package used in study 2 was well received. The feedback and coaching sessions were challenging, but considered a vital component for reinforcing progress, problem solving difficulties and refining skills. The scheduling of regular appointments provided a prompt to continue to invest effort despite the distractions of a busy service environment and to persist in the face of implementation difficulties.

Participants valued the use of MI as a parallel process to deliver aspects of training. This involved being receptive and responsive to each participant's needs during supervision and employing the same supportive, non-judgmental interpersonal style that underpins MI to support their learning. They noted that their learning was enhanced as they experienced MI on a personal level. The non-judgmental tone also encouraged participants to be open and honest about the difficulties they were experiencing and encouraged them to experiment with new skills. This was deemed particularly important given that difficulties in the areas upon which coaching typically focused (underlying attitudes and beliefs, interpersonal skills) tended to be emotionally imbued and personally felt.

Table 10-1 *Summary of Findings in Relation to the Overarching Research Questions*

Research question	Answer	Supporting evidence location
1) Do respiratory clinicians believe that MI is feasible and an acceptable adjunct to PR to enhance engagement and adherence to physical activity recommendations?	Participants deemed MI appropriate and relevant for addressing engagement and adherence issues as part of PR.	Initial perceptions see study 1 results (section 6.4.1) and discussion (section 6.5.1). Perceptions following more involved training see study 3 results (section 9.4.2.2.4) and discussion (section 9.5.1)
	Mixed evidence regarding feasibility:	
	Study 1 identified potential feasibility issues and highlighted a need for specific, extensive training and additional time to support delivery in practice.	See study 1 results (sections 6.4.3 and 6.4.4) and discussion (section 6.5.1)
	Study 3 revealed service/organisational issues result in prioritisation of short-term measures of impact, which compromise the time available for MI. Existence of practices that are antithetical to the spirit of MI, make the PR environment a challenging context to introduce the method.	See study 3 results (sections 9.4.1 and 9.4.3.2) and discussion (section 9.5)
	Practice samples obtained through study 2 provide some evidence of participants' ability to provide MI as part of PR.	See study 2 results (sections 8.4.4 and 8.4.5) and discussion (sections 8.5.3 and 8.5.4)
2) Is a tailored MI training package for PR clinicians feasible?	Mixed evidence. Some participants took longer than expected to complete each training activity and several withdrew prematurely. Service factors rather than negative perceptions of MI and the training intervention were cited as reasons.	See study 2 results (section 8.4.2) and discussion (section 8.5.2)
	Additional protected time and support required to enable clinicians to engage fully with training and complete each component in a timely manner	See study 3 results (section 9.4.3.2.2) and discussion (section 9.5.3.2)

Research question	Answer	Supporting evidence location
3) Does the training package lead to basic competency in MI?	Progressive development of skill evident at each stage of training, with mean values for MI spirit and overall global ratings reaching basic competency amongst study completers. Difficulties achieving the relative frequency and depth of reflective listening evident.	See study 2 results (sections 8.4.4 and 8.4.5) and discussion (sections 8.5.3 and 8.5.4)
4) What are PR clinicians' experiences of learning MI and using it as an adjunct to PR?	The training package was well received but considered demanding. On-going supervision was considered a vital component. The use of MI as a parallel process to deliver aspects of training deemed helpful for encouraging ongoing effort and modelling relevant skills.	See study 3 results (section 9.4.3.1) and discussion (section 9.5.1)
	Participants perceived MI to be fundamentally different from traditional practice and as such they experienced cognitive and emotional challenges whilst learning and applying skills.	See study 3 results (sections 9.4.1.2 and 9.4.2) and discussion (section 9.5.3)
	In general, participants noted improvements in their skills and confidence over time, which reinforced positive perceptions of MI. Training prompted some to re-evaluate the current PR culture and traditional practice.	See study 3 results (section 9.4.2.3) and discussion (section 9.5.1)
	For some, difficulties learning and applying MI coupled with the anticipation of future difficulties left them feeling despondent. This may have resulted in decreased commitment, disengagement and ultimately to their withdrawal from training.	

Note. MI = motivational interviewing; PR = pulmonary rehabilitation.

10.3 Contribution to knowledge base

The research contained within this thesis makes a significant contribution to applied research on MI in clinical practice within respiratory outpatient and community settings. It has provided unique insights into the reality of learning and applying MI as an adjunct to PR. Improvements in MI skills based on exposure to training will helpful for those planning and delivering training for research purposes as well as in clinical practice.

To the author's knowledge, this is the first programme of research to have explored the feasibility of MI as an adjunct to PR that has involving a relatively large number of clinicians from a range of different professional groups. Other studies reporting comprehensive feasibility and development work have involved a small number of MI providers and are all from the same research group (Benzo et al. 2013; Benzo et al. 2016; Benzo et al. 2018). In the UK, physiotherapists are often the primary point of contact for respiratory patients referred for PR and are therefore frequently key to encouraging any behaviour change. The external validity of this thesis research is strengthened by the fact that it has drawn on the experiences and insights from clinicians employed within several different organisations.

MI may be a useful adjunct to PR, but only if clinicians can acquire competency and they can deliver it in clinical practice. The research has tested this thoroughly with user input and feedback throughout and has revealed important insights in advance of a pilot trial of effectiveness. This is consistent with the goals of the Medical Research Council (MRC) complex intervention framework (Craig et al. 2008).

This work is novel in its focus on the feasibility of MI in its *pristine* rather than adapted form, which is common when MI is delivered to health contexts, including those involving patients with respiratory conditions. Using derivatives of MI may create time-efficiencies for providers and may reduce the need for intensive training, but creates the potential for Type III error; meaning that intervention 'failure' may be because the elements that relate to its efficacy of MI are missing, rather than a failure of MI (Miller and Rollnick 2014). It is clear from this research that developing competence in key areas of MI practice that have been linked to its efficacy such as the relative frequency and depth of reflective listening and shaping the trajectory of patient language (Amrhein et al. 2004; Miller and Rose 2009; Magill et al. 2018a) is particularly challenging for PR clinicians.

Other new insights provided by this research include elucidation of the factors underlying the difficulties that PR clinicians face when learning and integrating this novel approach (see section 9.5.3, page 287). The work has moved beyond description to provide an explanation for

the challenges by logically linking the findings with the declarative-procedural-reflective (DPR) model. Other researchers, for example Wallace (2011) have referred to the DPR model as a useful framework for explaining the process of learning MI, but have not used it to guide training content or make sense of training outcomes.

The training package used to teach PR clinicians how to use MI was progressively refined over the course of the research reported within this thesis. Initial insights regarding clinicians' training requirements were gathered through study 1 (clinician views) (see Table 6-2, page 165). The focus and content of the training package that was developed was subsequently updated during study 2 (learning MI) based on participant feedback and the author's observations whilst training (see Table 7-2, page 184).

Final recommendations for the training package incorporating the insights derived from all studies reported in this thesis are presented in Table 10-2 (page 311). This shows how workshop training and individualised supervision may be tailored to maximise its effectiveness and efficiency and provides a rationale for the inclusion of specific strategies. It emphasises the process of learning rather than what needs to be learnt. Whilst the recommendations stem from research involving clinicians who deliver PR, it is envisaged that they will be relevant to the training of health professionals more broadly.

This research has highlighted that successful delivery of the training package and integration of MI into practice would have resource implications for organisations offering PR. These are discussed in section 10.4 (page 319) in the context of the next stage of the research process.

Table 10-2 *Summary of Insights Provided by the Thesis Research for the Process of Training Pulmonary Rehabilitation Clinicians in Motivational Interviewing*

Strategy	Detail	Rationale
Training engagement		
1) Promote engagement as an early task	Teach how MI differs from usual practice sensitively. Describe MI as an alternative rather than superior approach.	Clinicians may vary in their interest in learning and applying MI. Need to minimise defensiveness.
	Evoke clinicians' experiences of strategies they may find helpful in motivating patients first, and then describe how MI may build on these.	Build motivation and confidence for learning.
	Explore issues relating to professional identity/role and the potential 'fit' of MI.	Pre-empt clinicians disengaging as a result of not seeing the relevance to their role or not believing they will be able to enact the skills.
2) Monitor and address fluctuations in engagement and interest over time	Provide opportunities to reflect on progress. See also point 3) below regarding value of using MI as a vehicle for training (parallel process) to encourage clinicians to talk about difficulties and challenges they are experiencing in an open and unguarded way.	Learning MI may be conceptualised as a form of behaviour change for clinicians, with the challenges mirroring those often encountered by patients who are attempting to change their behaviour. Additional, targeted support is required to maintain effort and commitment in the face of difficulties.
	Explore *attitudes, beliefs and assumptions* that may contribute to training and implementation difficulties (see point 6). Provide targeted support to address issues identified.	Those whose baseline practice is most out of keeping with the spirit of MI (for example preponderance of MI-non adherent behaviours, lower empathy) may be most vulnerable to decreases in confidence and interest and increased despondency/risk of withdrawal as they progress through training.

Strategy	Detail	Rationale
3) Use MI as a training style (parallel process)	Use the style of MI to facilitate training. For example: i) when clinician lacks confidence in their ability to implement MI, affirm effort in the face of difficulties, evoke their own ideas about ways to address issues encountered; ii) when sub-optimal engagement with training is evident, pre-empt defensiveness by acknowledging difficulties, explore issues influencing engagement in a non-judgmental framework, emphasise autonomy.	Clinicians learn through their experience of MI on a personal level as it is modelled to them. The implication of the insights gained for their own work with patients can be discussed during supervision. The encouraging, supportive style of MI may promote ongoing engagement with training. Particularly helpful when addressing learning challenges traced to *self-schema* (*therapist attitudes, interpersonal perceptual skills, interpersonal relational skills)* which tend to be emotionally imbued and personally felt. Avoidance of negative judgment helps clinician to remain open and honest with development needs and experiment with new skills without fear of repercussions.
Targeted training		
4) Deconstruct complex skills and pace training appropriately	For example, deconstruct reflective listening into its constituent parts to reduce the cognitive demand: Step 1: provide written patient statements (to reduce demand on short-term memory associated with spoken form), Step 2: clinician makes notes on what has been said and possible meanings (focus on *interpersonal perceptual skills*), Step 3: clinician constructs reflective listening statements embodying each hypothesis (focus on *interpersonal relational skills)*. Progress by using audio recorded patient statements and reducing time available to generate reflections. Then integrate skills within conversations.	Using several elements of the declarative and procedural systems concurrently creates excessive cognitive demands. Concerns about 'getting lost' results in decreased focus on patient's experience. Need to deconstruct key skills to avoid overloading working memory whilst skills are novel and have not been automated. Example provided supports the development of *interpersonal perceptual skills* (particularly the ability to tune in to and mentally represent the patient's experience) without being burdened by need to construct a reflective listening statement in the moment or being concerned about the next strategy.

Strategy	Detail	Rationale
5) Include mindfulness element to skills-based exercises to support development of *interpersonal perceptual skills*	Introduction of mindful practice to selected skill-based exercises in which clinician describes their internal state (for example the cognitive and emotional reactions to what speaker said) and their natural responding inclination (without acting on it). Where necessary, explore unhelpful *attitudes, beliefs and assumptions* which influence the clinician's internal state and make it more likely they will respond with MI-non adherent behaviour (see point 6).	Clinician's own internal state influences other components of *interpersonal perceptual skills* (what they attend to, how it is cognitively represented). For example, concerns about a consultation in which the patient elects not to change and viewing such decisions as a personal failing may trigger the righting reflex. The aim is to learn to recognise and acknowledge one's own internal state without acting on it or allowing it to detract from the use of MI-consistent skills.

Strategy	Detail	Rationale
6) Explore unhelpful *therapist attitudes, beliefs and assumptions*	Explore *attitudes, beliefs and assumptions* that may interfere with effective MI practice. Help clinician to identify more helpful and accurate alternatives. For example:	Some difficulties using MI effectively may be traced to specific *therapist attitudes, beliefs and assumptions*. These influence i) what aspects of patient speech is attended to and how it is interpreted *('interpersonal perceptual skills'*); and ii) the skills and strategies used to respond ('*interpersonal relational skills*' and *'when-then rules, plans, procedures and skills'*).
	i) Difficulties supressing righting reflex may result from deficit world view derived from professional training and other important aspects of role (assessing, diagnosing, directing).	Belief that patients' lack of motivation stems from a lack of knowledge skills or the right attitude prompts clinician to install what is perceived to be lacking. Decreases interest in and attempts to evoke patient's perspective.
	ii) Feeling uncomfortable when exploring emotive subjects with patients (for example when developing discrepancy) may stem from belief that patients are being harmed if they stay with unpleasant emotions, reinforced by belief that as a helper they should protect patients from uncomfortable feelings.	Resolving ambivalence often requires patients to explore deeply held values, work through internal conflicts and confront the reality of their situation and their choices (which tend to be emotionally imbued). Avoiding potentially emotive topics or withdrawing prematurely when patients become distressed can be problematic if it deprives them of the opportunity to work through issues that may undermine change.

Strategy	Detail	Rationale
7) Provide opportunities for on-going purposeful practice to develop and refine *When-then rules, plans, procedures and skills*	Provide opportunities for on-going purposeful practice and reassure clinicians that fluency will emerge over time. During workshop training, balance role-play exercises with real-plays whereby MI skills are practiced with a speaker who discusses a behaviour that they are actually ambivalent about changing, rather than role-playing a made-up scenario or acting like a patient they have previously treated.	Translating *declarative knowledge* into *procedural skills* involves repeated practice. Initially practice feels mechanistic and awkward as the *self-as-therapist system* develops. Personalised style develops over time as the *self-schema* re-emerges. Role-plays enables clinician to practice use of skills and strategies in a PR context. Real-plays may promote deeper learning. When clinician is in the 'speaker's chair' they experience the impact of MI on a personal level. The insights gained and implications for their own practice are reflected upon during a debrief. Whilst in the 'clinician chair', the clinician is encouraged to attend to the speaker's reactions and experience (which are authentic as they are not having to act). Therefore, the skills are mentally represented in two systems with two paths for retrieval – the *self-schema* (based on the personal experience) and the *self-as-therapist schema* (based on the clinician's observations when they enact the skills).

Strategy	Detail	Rationale
8) Use practice samples to support *reflection* during coaching	Review practice samples during coaching to address nuance of language and interpersonal dynamics evident in a session that may have been missed at the time.	As novice learners there is limited attentional resource to *reflect-in -action* (attention during session is typically focused on technical matters). *Interpersonal perceptual skills* may be insufficiently developed to attune to and mentally represent all elements of patient experience.
	Encourage clinician to prepare by reviewing each recording ahead of supervision to identify specific issues, make notes on their own conceptualisation of the problem and ways to improve.	Effectiveness of coaching may be undermined by clinicians' ability to recall specific details of patient consultations. Support is required to conceptualise challenging elements of an interaction.
9) Use flexible treatment manual	Use flexible treatment manual to guide implementation efforts (see PREAMP manual Appendix L, page 401).	Cognitive burden associated with high volume of *declarative knowledge* may be eased through use of a manual.
	Pre-empt mechanistic application of strategies by emphasising spirit of the approach. Encourage clinicians to be guided by the overall aim of each strategy rather than follow instructions in an overly rigid way.	Manual needs to be flexible to ensure the spirit and process of MI are appropriately represented. Technical information and practical steps about how to proceed need to be balanced with more abstract information that communicates the essence of the approach and underlying spirit.
10) Encourage 'personalisation' of MI	Encourage clinicians to develop their own phraseology/language to avoid skills feeling/appearing mechanistic.	Clinicians comment that the phraseology/ language in the PREAMP manual is helpful for 'getting going' at the novice stage of learning, but there is a need to personalise the language over time, so it feels natural.

Strategy	Detail	Rationale
11) Include switching communication style based on need in training	As part of training, discuss how to structure those appointments in which MI is introduced alongside other clinical tasks. Teach how to switch style based on need and, where relevant, explore how an MI style may be used to underpin other tasks.	Clinicians often need to integrate MI within appointments that involve other clinical tasks. Many of those tasks necessitate a different communication style (for example a clinician-centred directing style to address safety issues or acute medical problems). Some of the difficulties using MI skilfully relate to the challenge of switching communication style flexibly within a consultation.
On-going support		
12) Teach clinicians how to evaluate their own performance during MI	Encourage clinicians to refine their MI skills on an ongoing basis by sensitising them to the patient language cues (change talk, sustain talk and discord) that indicate good and no so good practice of MI.	Immediate reinforcement is provided through reflecting on patient response in the moment. Learning occurs independent of supervision meetings. Supports on-going development of skills.
13) Shape expectations regarding the potential for fluctuations in perceptions of competence and confidence to deliver MI effectively	Normalise fluctuating perceptions of competence and confidence. Provide reassurance that both will develop over time through purposeful practice and reflection. Prior to feedback sessions, negotiate how results of analyses will be used and if/when discrepancies between actual and competence thresholds should be highlighted. Help the clinician to identify a way of thinking that may help them cope with setbacks. Discuss experiences of challenging consultations during coaching to ensure they are appropriately represented at an emotion level.	Reduce the risk of clinicians becoming disheartened, particularly given *self-schema* involvement may mean this could interfere with MI practice and skill development. Maximise the likelihood that clinicians remain engaged with training despite the experience of setbacks.

Strategy	Detail	Rationale
14) Utilise a stepwise approach to training	Extend or curtailing training based on achievement of basic competency thresholds	Address variation in rate and extent of skill acquisition following fixed dose of training.

Note. MI = motivational interviewing; PR = pulmonary rehabilitation; PREAMP = Promoting exercise adherence by blending motivational interviewing with pulmonary rehabilitation intervention manual developed for study 2. Constructs from the DPR model have been italicised for emphasis.
Insights informed by: "Therapist skills: A cognitive model of their acquisition and refinement" by Bennett-Levy J (2006). *Behavioural and Cognitive Psychotherapy* 34(1): 57-78; "The ups and downs of cognitive therapy training: What happens to trainees' perception of their competence during a cognitive therapy training course?" by J Bennett-Levy and A Beedie (2007) *Behavioural and Cognitive Psychotherapy* 35(1): 61-75; "Self and self-reflection in the therapeutic relationship: A conceptual map and practical strategies for the training, supervision and self-supervision of interpersonal skills" by J Bennett-Levy and R Thwaites (2007) IN: P Gilbert and RL Leahy (eds) *The therapeutic relationship in the cognitive behavioral therapies*. London, UK: Routledge 255-281.

10.4 Implications for future research

This section contains a discussion of the implications of the thesis research for future work. Table 10-3 (page 320) provides a summary of the key tasks addressed by the thesis in relation to the MRC complex intervention framework. In light of the work completed to date, the next logical step in the research process would be to complete a pilot randomised controlled trial (RCT) of MI combined with PR versus PR alone. The aim would be to inform the development of a definitive RCT and determine the feasibility of proceeding to that stage. Informed by the knowledge and experience he gained during this PhD research, the author recommends that the main elements to be piloted should be:

i) The procedure for objective measurement of physical activity;

ii) A comparison condition to control for the additional attention provided by MI;

iii) Measures to enable cost-effectiveness in a definitive trial - the author considers that CCGs would only be willing to fund an MI plus PR model if a definitive trial had demonstrated cost-effectiveness;

iv) A strategy for gathering practice samples for the purpose of process evaluation (to document treatment integrity and measure potential mechanisms of action). As discussed in section 8.5.7.3 (page 233), relying on providers to select which patient sessions to record for treatment integrity purposes is likely to result in a best-case scenario with regard to MI skill. Given that treatment integrity may be influenced by the type of MI session ('Engagement', 'Strengthening motivation', 'Support' or 'Relapse Prevention'), it would be prudent to ensure all types of session are analysed. Best practice involves recording all trial sessions and randomly selecting a subset for analysis, so providers are unaware which sessions will be evaluated (Miller and Rollnick 2014).

A pilot RCT would also need to address the outstanding intervention development tasks. A point made in 7.2.3 (page 176) is that initial proposals for the duration and frequency of MI required to promote change represents a preliminary guide, and that delivery in practice would require modification to suit local circumstances as well as patient need and response. A pilot RCT would need to be designed to determine the degree of flexibility in delivery and tailoring of MI (frequency, timing and duration) that is permissible without compromising its function, as well as to evaluate how the context influences implementation. As discussed in section 3.11.4 (page 59) the Motivational Interviewing Skill Code (MISC) (De Jonge et al. 2005; Miller et al. 2008), which captures patient in-session responses to MI that are predictive of behaviour

Table 10-3 *Summary of Completed Tasks in Relation to the Medical Research Council (MRC) Complex Intervention Framework*

Framework element	Task	Detail
Development	Identify the evidence base	Reported results of two scoping reviews i) the effectiveness of MI for increasing physical activity in contexts relating to PR, and ii) the effectiveness of MI training for health professionals.
	Identify/develop theory	Construction of logic model of the problem of sub-optimal engagement with PR, and poor adherence to physical activity recommendations.
		Presented overview of MI theory and a critical review of process research evaluating the hypothesised mechanisms of action of MI.
		Presented coherent theory of how MI may complement PR.
	Model process	Specification of process flow clarifying initial ideas regarding what will be delivered, when and by whom, together with anticipated duration of input.
		Specification of aim, objectives and content of MI-based consultations and development of PREAMP intervention manual to guide delivery.
		Development and refinement of training package to support PR clinician skill acquisition.
		Identified the relationship between exposure to training and MI skill acquisition.
Feasibility	Assess acceptability and feasibility of MI intervention and training package	Tested the impact of MI training on skill acquisition and gathered feedback from PR clinicians at all stages of research regarding MI intervention and training package.
Evaluation	Process evaluation	Described the feasibility of a method to assess treatment integrity.
Implementation	Examination of facilitators and barriers to adoption and embedding into clinical services	Identified personal, service and programme issues influencing the integration of MI and adherence in practice.

Note. MI = motivational interviewing; PR = pulmonary rehabilitation; PREAMP = Promoting exercise adherence by blending motivational interviewing with pulmonary rehabilitation intervention manual developed for study 2.
Adapted from "Developing and evaluating complex interventions: The new Medical Research Council guidance" by P Craig, P Dieppe, S Macintyre, S Michie, I Nazareth and M Petticrew (2008). Medical Research Council; and "Complex interventions in health: An overview of research methods" by DA Richards and IR Hallberg (eds) (2015). London: Routledge.

change outcomes, may be used for this purpose. The Client Evaluation of Motivational Interviewing (CEMI) (Madson et al. 2009a; Madson et al. 2013; Madson et al. 2015) could be used to augment the observer ratings of the effect of MI.

Recruitment and retention rates would need to be documented for the duration of any pilot RCT, and effect sizes and variation calculated for the primary outcome to enable sample size calculations for a definitive trial.

As discussed in section 10.2 (page 301), this research has highlighted several feasibility issues that would need to be addressed in the development of the protocol for a pilot RCT. In order for those responsible for delivery to meet the proposed thresholds for basic competency in MI, a trial would need to secure agreement that the protocol would provide sufficient protected time for clinicians to engage fully with MI training, and to complete all training components in a timely manner. In the context of a stepwise model, providers would require differing levels of input (intensity and duration) based on their initial response to training and varying levels of motivation to adjust to this style of working. The protocol would also need to reflect the additional appointment time that has been identified by the thesis research as being necessary for the implementation of MI within clinical practice. This would involve an increase in duration of routine appointments to enable MI to be delivered alongside other clinical tasks, the provision of additional appointments dedicated to MI, or some combination. Within a pilot RCT, the additional costs to support training and increase availability of appointment time would be regarded as excess treatment costs. Any pilot RCT would need to document accurately what those are (compared to treatment as usual) to support the development of the cost-effectiveness analysis within a definitive trial.

Study 3 (trainee experiences) revealed that in some instances, the prioritisation of short-term measures of performance has resulted in services only recruiting those patients who are perceived to be motivated from the outset, and prematurely discharging those who fail to meet attendance thresholds. The protocol for a pilot RCT would need to make explicit at what point patients are offered the intervention and what the inclusion/exclusion criteria are, so it would not be possible for clinicians to make ad-hoc decisions about whether a patient should receive the intervention or not.

10.5 Final conclusion

The overarching aim of the programme of research contained within this thesis was to explore the feasibility of MI used as an adjunct to PR for promoting engagement and adherence to physical activity recommendations.

Participants in these studies considered the use of MI to be an acceptable adjunct to PR, carrying the potential to improve patient outcomes. Training was well received, with progressive improvements in most elements of MI skill evident. The largest gains were observed amongst those who completed the training package. Achieving the relative balance and complexity of reflective listening was challenging, as was organising the conversation and responding in a way that resolved patients' ambivalence and increased their commitment to PR. Further skill development in these areas would likely be advantageous to facilitate the effectiveness of the intervention. One of the ongoing challenges to the implementation of MI in PR settings, would be the allocation of sufficient time and resources to allow staff to acquire MI skills and deliver an adequate dose of the intervention.

In light of the work completed to date, the next logical step in the research process would be to complete a pilot RCT of MI combined with PR, versus PR alone. This would serve to inform the development of a definitive RCT and determine the feasibility of such a study.

Appendix A Summary of studies reporting the impact of pulmonary rehabilitation on objectively assessed physical activity in daily living

Table A-1 *Summary of Studies Reporting the Impact of Pulmonary Rehabilitation (PR) on Activity Monitor Assessed Physical Activity in Daily Living*

Author (year)	COPD severity[a]	Monitoring: duration and method	Outcome	Notes
Mador et al. (2011)	n=24 GOLD I-IV	7-days prior to PR and 7-days after PR. Tri-axial accelerometer.	No increases in VMU/minute (unit of movement) between pre-PR and post PR – absolute difference (p= .4), %difference (p> .05). Improvements in time spent above VMU thresholds for exercise intensity not significant: > 250 VMU/minute (p> .05); >500VMU/minute (p> .05).	PR: 8-weeks, 60-minute sessions: 2-days/week. After 2-3 weeks home exercise recommended ≥ 3-days/week.
Egan et al. (2012)	n=47 GOLD I-IV	5-days before PR, immediately after PR and at 20 weeks. Subset (n=17) repeated assessment at 52 weeks. Bi-axial accelerometer.	No increases from baseline to post PR or 20-weeks in average number of daily steps (baseline 3611 ±2863; post PR 3527 ±2870; 20 weeks 3242 ±3436), percent of time spent sedentary (<3METS) (baseline 93.6 ± 7.8; post PR 93.5 ± 4.1; 20 weeks 91.8 ±7.3), or time spent in active exercise (baseline 48.0 ±66.8; post PR 51.0 ± 53.0; 20 weeks 47.6 ±63.5) (all ps> .05). No difference between baseline and 52-week follow-up (all ps> .05).	PR: 7-weeks, 60-minute sessions: 2-days/week. Three additional 30-minute walking sessions/week + inspiratory-muscle training programme recommended. Intent-to-treat analysis used.
Saunders et al. (2015)	N=190 GOLD II-IV	Baseline during 2nd or 3rd week PR, within 2-weeks post PR and at 3 and 9-months post-PR. 7 consecutive days recorded by patient in log-book at end of each day. Yamax Digi-Walker pedometer.	No change in steps/day across assessments (no ps reported).	PR: 7 different programmes. Duration – 6, 10 or 12 weeks; frequency 2 or 3-days/week; total supervised exercise sessions 18, 20 or 24. Exercise 1-1.5 hours/session (aerobic-60-80% max power output for 30 minutes + resistance 2-3-sets of 8-10-reps 50-85%-maximum).

Author (year)	COPD severity[a]	Monitoring: duration and method	Outcome	Notes
Mesquita et al. (2017)	n=90 GOLD II-III	Immediately prior to and post PR. ≥ 5-days (3-weekdays +sat+ sun). Tri-axial accelerometer	No change in minutes/day sedentary behaviour, light activities, MVPA, time in ≥10-minute bouts of MVPA, frequency of ≥10-minute bouts of MVPA or duration of ≥10-minute bouts of MVPA (min/bout) (all *ps*> .05).	PR: 40-sessions (outpatient 8-weeks, 3 half days/week, followed by 8-weeks, 2-half days/week). Moderate-to-high intensity progressive endurance and strength training + flexibility and 'general physical exercise' + daily supervised 30-min outdoor walks.

Notes. GOLD = Global Initiative for Chronic Obstructive Lung Disease; MET = metabolic equivalent (a measure of energy cost: 1 MET = 1kcal/kg bodyweight/hour); MVPA = moderate to vigorous intensity physical activity; VMU = vector magnitude units (raw data accelerometer output). ± = standard deviation. Participant numbers refer to study completers when intent-to treat analysis was not used. Focus of analysis is activity performed in daily living: exercise performed during PR excluded from analyses.
[a]Severity based on mean and standard deviation pre-rehabilitation percentage of predicted forced expiratory volume in one second (FEV_1). .

Appendix B Provider training and treatment integrity within trials of motivational interviewing in health contexts

Table B-1 *Provider Training and Treatment Integrity Within Trials of Motivational Interviewing (MI) in Health Contexts*

Author	Design	n[a]	Profession	Setting	Focus	Outcomes	Training	Treatment integrity[b]
Benzo et al. (2013) Benzo et al. (2016)	Pilot study + fidelity monitoring during main trial	2	Nurse and respiratory therapist	Hospital, in-patient (US)	COPD self-management	MITI 3.1.1 global ratings. All pilot study sessions (n=88) recorded and analysed. 100 (5%) recordings from main trial analysed.	Face to face theory (6-hours); reading; role-play based learning of intervention (5-hours) feedback and coaching to strengthen skills and address drift in trial (10-hours over 6-months).	Post training confirmed achievement of $\geq$ 3 on all MITI global ratings (scores not provided). Integrity during trial: **Empathy 3.9 (±0.5)**; **collaboration 4 (±0.6)**; **autonomy/support 4 (±0.3)**; **direction 3.9 (±0.5)**; **evocation 3.9 (±0.5)**.
Bohman et al. (2013)	Process evaluation of RCT	36	Nurses	Child Health Care Centre (Sweden)	Physical activity and healthy diet within families to prevent childhood obesity	MITI 3.0 (Swedish version) 2-3-weeks post-workshop selected by nurse + 1st trial session at 4.25-months (post supervision).	3.5-day workshop in 2 parts (1½-days + 2-days with mean 17-days apart) (28-hours total), 4 x 30-min telephone supervision sessions including feedback on recorded practice sessions 2-3, 5, 8 and 11-weeks post-workshop – the first analysed with MITI to assist feedback.	Mean score on all MITI variables fell short of MITI basic competency at post-workshop and post-supervision. Post supervision: MI spirit 2.76 (±0.63); Empathy 2.75 (±0.60); R:Q ratio 0.79 (±0.57); %OQ 41 (±18); %CR 13 (±13); %MI-A 69 (±41).

Author	Design	n[a]	Profession	Setting	Focus	Outcomes	Training	Treatment integrity[b]
Broekhuizen et al. (2012)	Process evaluation of RCT	2	Lifestyle coach, nurse	National screening programme community based (Holland)	Physical activity, smoking diet for familial hypercholesterolemia	MITI 3.1.1. Random sample of 20 audio-recorded counselling sessions (approx. 10% of sessions).	3-day workshop including practical training sessions with professional actors.	Empathy 2.9; MI spirit 2.7; Direction 3.3; **R:Q ratio 1.03;** % OQ 21%; % CR 39%; % MIA 83%.

Author	Design	n[a]	Profession	Setting	Focus	Outcomes	Training	Treatment integrity[b]
Channon et al. (2016)	Process evaluation of RCT	45-47	Nurses	Family Nurse Partnership (UK)	Tobacco use, child family health.	MITI 3.1.1. Randomly selected nurses n=42(69% of those eligible) submitted self-selected audio-recordings (total 48 recordings during pregnancy phase and 45 recordings during infancy phase).	Initial 2-day workshop. 4 x 1/2 -day team sessions every 3-weeks.	Variable achievement of MITI basic competency targets. Median (IQR) scores for 'pregnancy phase' (n=47): **Mean global rating 4.0 (3.6–4.2)**; **MI spirit 3.7 (3.3-4.0)**; R:Q ratio 0.5 (0.3-0.8); %OQ 25.0 (16.1-34.5); %CR 26.7 (18.2-40.0); **% MI-A 100 (85.7-100)**. Median (IQR) scores for 'infancy phase' n=45): **Mean global rating 3.8 (3.4-4.1)**; MI spirit 3.3 (3.0-4.0); R:Q ratio 0.7 (0.5-1.2); %OQ 18.8 11.8-32.0); %CR 18.8 (13.3-33.3); **% MI-A 100 (80.0-100.0)**.

Author	Design	n[a]	Profession	Setting	Focus	Outcomes	Training	Treatment integrity[b]
Enö Persson et al. (2016)[c]	Process evaluation of RCT (follow-up to Bohman et al. (2013)	33	Nurses	Child health care centres	Physical activity and healthy diet within families	MITI 3.0 (Swedish version) 1) Post initial training at 4-months (workshop + 4 supervision sessions) 2) End of training during trial (at 12-months post-supervision).	Same as Bohman (2013) with additional 5 x 30-minute telephone supervision sessions at 2-3-month intervals involving feedback on recorded practice sessions (all MITI coded) and coaching during intervention phase of trial.	Mean score on all MITI variables fell short of MITI basic competency at both follow-up points. Post initial training: MI spirit 2.79 (±0.60); Empathy 2.79 (±0.60); R:Q ratio 0.83 (±0.63); %OQ 39 (±19); %CR 14 (±13); %MIA 69 (±40). Post supervision: MI spirit 2.87 (±0.58); Empathy 2.79 (±0.78); R:Q ratio 0.85 (±0.48); %OQ 37 (±18); %CR 25 (±15); %MI-A 57 (±50). Across MITI components 18-55% of trainees achieved basic competency post-supervision.

Author	Design	n[a]	Profession	Setting	Focus	Outcomes	Training	Treatment integrity[b]
El-Mallakh et al. (2012)	Process evaluation as part of a pilot trial	1	Nurse	Diabetes management intervention study	Physical activity, glucose monitoring and medication adherence.	MITI 3.0 All consultations recorded. 18 (25%) selected using stratified sampling based on when sessions were conducted for analysis.	4 x 3-hour workshops + 'Several' telephone-based coaching sessions. Six video-recorded simulated patient encounters with feedback. Following achievement of performance targets, interventionist began consulting with trial participants.	**Basic competency or proficiency was achieved on all MITI components on 11/17 sessions.** **MI spirit achieved basic competency on all sessions.** By final follow-up: **MI spirit 4.67 (±2.85)**; **R:Q ratio 1.9 (±0.78)**; **%OQ 100 (±22)**; **%CR 42 (±23)**; **%MI-A 100 (±13)**.
Forsberg et al. (2010)	Treatment fidelity reporting of an evaluation project	3	Health pedagogues and dental hygienist	Swedish national tobacco quit line	Smoking	MITI 3.0 analysis of audio-recorded samples - first 3 consultations for each of 11 assessment periods over 2.5 years.	2-day (12-hour) workshop + group-based supervision (MITI feedback on practice with quitline clients and coaching). Supervision provided for duration of study, occurred most frequently in first 3-months (fortnightly). Total 84-hours in 3-hour segments.	Only 3 of 9 MI counsellors had sufficient recorded consultations to be included in the analysis. **Each counsellor reached basic competency for evocation, empathy, collaboration, direction, MI spirit, R:Q ratio, %CR** during 2½ year observation, but with variations between counsellors and fluctuations over time. Mean %MIA and %OQ achieved threshold only at 1 assessment point.

Author	Design	n[a]	Profession	Setting	Focus	Outcomes	Training	Treatment integrity[b]
Jelsma et al. (2017)	Process evaluation of RCT	8	Lifestyle coaches (various backgrou-nds)	10 centres (across Europe)	Healthy eating, physical activity or both to prevent gestational diabetes	MITI 3.1.1. All study sessions recorded. Aim was to code a random selection of ≥4 sessions per coach.	2-day introductory workshop, 2-day follow-up workshop to review progress and receive feedback on role-play. Total 32-hours training.	8 coaches (67% of those trained/delivering the intervention) submitted recordings. 28 (17.5%) of available recordings analysed. Overall: Little evidence of achievement of MITI basic competency thresholds. Mean global ratings for: MI spirit 3.2; Evocation 3.1; Collaboration 3.0; Autonomy/support 3.5; **Direction 4.5**; Empathy 3.3. R:Q ratio 0.94; %OQ 41; %CR 31; %MI-A 81.

Author	Design	n[a]	Profession	Setting	Focus	Outcomes	Training	Treatment integrity[b]
Magill et al. (2018b)	Process evaluation of RCT	11	Nurses	Primary care	Medication adherence, blood sugar monitoring, physical activity and diet for those with sub-optimal diabetic control	MITI 3.1.1. All consultations recorded. Analysis of 11 consultations (1 per nurse) recorded post training and 127 (approx. 15% total) recorded throughout the trial. Decision rule – MI adherence = achievement of basic competency for %MIA and empathy.	12 x 3-hour interactive workshops Monthly group supervision in person, or individual by telephone. Additional training provided to those not achieving proficiency criteria post-training.	Post training MITI scores: MI spirit 3.42 (±0.67); **Empathy 4.09 (±1.04)**; Median (IQR) R:Q ratio 0.67 (0.45-0.82); %OQ 45.5 (25.0-72.2); %CR 9.1 (0-28.6); %MI-A 86.2 (76.9-100). During Trial: **MI spirit 4.03 (±1.05)**; **Empathy 4.23 (±0.89)**; Median (IQR) R:Q ratio 0.44 (0.32-0.61); %OQ 46.5 (33.3-57.1); **%CR 53.8 (40.0-71.4)**; %MI-A 63.4 (33.3-83.3).

Author	Design	n[a]	Profession	Setting	Focus	Outcomes	Training	Treatment integrity[b]
Mertens et al. (2016)	Process evaluation of RCT	2	Nurses	Pre-treatment pain management (Holland)	Readiness for pain management (e.g. graduated exercise, managing unhelpful thinking).	MITI 3.1.1. All trial sessions audio-recorded. Random selection of 37 MI sessions stratified by treatment session coded.	Nurses experienced in MI prior to trial. 2 x 1/2 -day workshops covering trial specific MI application. Follow-up supervision during trial 3 x ½-day workshops including feedback on audio-recorded trial sessions.	MI spirit 3.41; **Evocation 3.62**; Collaboration 3.43; Autonomy/support 3.19; **Direction 4.49**; **Empathy 3.95**; **R:Q ratio 1.01**; %OQ 40.09; %CR 22.72; %MI-A 37.65.
Smith et al. (2012a)	Process evaluation of pilot RCT	1	Social worker	Patients with advanced multiple-sclerosis	Physical activity/ exercise, programme attendance	MITI 3.1.1. All 20 MI-consultations audio-recorded and coded.	40-hours MI training and weekly supervision.	**MI spirit 4.3 (±0.3)**; **R:Q ratio 2.6 (±0.6)**; **%OQ 56.7 (±10.7)**; %CR 39.9 (±10.1); **%MI-A 95.4 (±4.5)**.

Author	Design	n[a]	Profession	Setting	Focus	Outcomes	Training	Treatment integrity[b]
Welch et al. (2011)	Process evaluation of RCT	2	Certified diabetes educators	Patients with poorly controlled type II diabetes	Diabetes self-management (diet, medication, monitoring, physical activity)	MISC 1.0 and 2.0 Random sample of 24 sessions per provider at mid-point of intervention phase	2-day initial workshop followed by in-person and group conference calls (twice a month in year one and then monthly thereafter) over 3-year study period. Provided MITI based individual feedback and coaching (2-4 hours per month) plus 1-day coaching sessions twice per year	Mean MI spirit 4.43; **R:Q ratio 1.92;** %OQ 27.

Author	Design	n[a]	Profession	Setting	Focus	Outcomes	Training	Treatment integrity[b]
Wilson et al. (2018)	Process evaluation of RCT	4	Various including nursing, social work	Community	Child oral health	MITI 3.1.1. All trial sessions audio-recorded. Random 225 (20%) coded.	2-day workshop Feedback on ≥5 practice samples prior to trial. During trial immediate feedback provided on first 5 sessions, and 3 of second 5 sessions. Additional supervision sessions twice /month in first 6-months and then monthly.	**Mean global rating 4.0 (95% CI: 4.0, 4.1)**; **Evocation 4.0 (95% CI: 3.9, 4.1)**; **Collaboration 3.9 (95% CI: 3.8, 4.0)**; **Autonomy/support 4.2 (95% CI: 4.1, 4.3)**; **Direction 4.1 (95% CI: 4.0, 4.2)**; **Empathy 4.0 (95% CI: 3.9, 4.1)**; R:Q ratio 0.6 (95% CI: 0.6, 0.7); **%OQ 55.8 (95% CI: 52.7, 58.9)**; **%CR 42.8 (95% CI: 39.4, 46.1)**; **%MI-A 93.3 (95% CI: 91.6, 95.1)**.

Note. CI = confidence intervals; MISC = Motivational Interviewing Skill Code; MITI = Motivational Interviewing Treatment Integrity coding instrument; RCT = randomised controlled trial. MI spirit = average of autonomy respect, collaboration and evocation global ratings; R:Q ratio = the ratio of reflective listening statements to questions; %CR = percentage of reflective listening statements that were complex; %MI-A = percentage of behaviours that were MI adherent; %OQ = percentage of questions that were open ended.

[a]number of MI trainees contributing to the analysis of skill. [b]Treatment integrity scores are presented as means and where provided 95% CI or standard deviations (denoted by ±) or median and inter quartile range (IQR). Components appearing in bold face denotes achievement of at least basic competency in MI as defined within the MISC and MITI coding manuals. [c]This study was an extension of the one reported by Bohman (2013). Following sub-optimal MI integrity and small effect sizes in the main trial, nurse interventionists received additional training with the impact on treatment integrity reported here.

Appendix C Assessment of bias for identified studies within motivational interviewing literature reviews

Table C-1 *Assessment of Bias (PEDro Scores) for Identified Studies Testing the Effect of Motivational Interviewing-based Interventions on Physical Activity for Patients with Chronic Obstructive Pulmonary Disease Referred for Pulmonary Rehabilitation*

Trial	Eligibility criteria (not scored)	Random allocation	Concealed allocation	Baseline compara-bility	Participant blinding	Therapist blinding	Assessor blinding	Adequate follow-up (>85% participants complete > 1 measure)	Intent to treat analysis	Between group comparisons	Point estimates and variability	Score / 10
Altenburg et al. (2015)	✓	✓	×	✓	×	×	×	×	×	✓	✓	4
Benzo et al. (2016)[a]	✓	✓	×	✓	×	×	✓	✓	✓	✓	✓	7
Burtin et al. (2015)	×	✓	✓	✓	×	×	✓	×	×	✓	✓	6
de Blok et al. (2006)	✓	✓	×	✓	×	×	✓	×	×	✓	✓	5
Holland et al. (2017)[b]	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	8

Note. [a]PEDro score based on the assessment of the primary outcome (percentage of patients with a COPD related rehospitalisation at 12-months). For physical activity (secondary) outcomes assessment was not made blind to group assignment, analysis was not intent-to-treat, and no details regarding variability of outcomes were provided. [b]PEDro score based on assessment of the primary outcome (6-minute walk distance). Assessment of physical activity outcomes was not made blind to group assignment, follow-up scores were obtained for ≤85% of the sample, and analysis was not intent-to-treat.

Table C-2 *Assessment of Bias (PEDro Scores) for Controlled Trials Testing the Effect of Motivational Interviewing for Health Professionals*

Trial	Eligibility criteria (not scored)	Random allocation	Concealed allocation	Baseline compara-bility	Participant blinding	Therapist blinding	Assessor blinding	Adequate follow-up (>85% participants complete >1 measure)	Intent to treat analysis	Between group comparisons	Point estimates and variability	Score / 10
Beach et al. (2018)	×	✓	×	✓	×	×	✓	×	×	✓	×	4
Fu et al. (2015)	✓	✓	✓	✓	×	×	✓	×	×	✓	✓	6
Noordman et al. (2014)	✓	✓	×	✓	×	×	×	✓	✓	✓	✓	6
Victor et al. (2019)	×	×	×	×	×	×	×	✓	×	✓	✓	3

Table C-3 *Assessment of Bias (Downs and Black criteria) for Cohort Study Testing the Effect of Motivational Interviewing for Health Professionals*

Criteria	Trial Dobber et al. (2019)
Was an attempt made to blind participants to the intervention they have received?	No
Have the characteristics of participants lost to follow-up been described?	No
Do the analyses adjust for different lengths of follow-up of participants?	No
Were the statistical tests used to assess the main outcomes appropriate?	Yes
Was compliance with the intervention/s reliable?	Yes
Were the main outcome measures used accurate (valid and reliable)?	Yes
Was there adequate adjustment for confounding in the analyses from which the main findings were drawn?	No
Were losses of patients to follow-up taken into account?	Yes

Appendix D Description of the declarative-reflective-procedural (DPR) model of therapist skill acquisition and refinement applied to motivational interviewing

The following sub-sections contain a description of the declarative-procedural-reflective (DPR) model in relation to learning MI. The original model proposed by Bennett-Levy (2006) is depicted in Figure D1.

D.1 Declarative system

The declarative system contains intellectual insights about the interpersonal, conceptual and technical underpinnings of the method. In the context of MI, novices learn for example about the meaning of empathy and its value in developing a strong therapeutic relationship (interpersonal knowledge). They acquire knowledge and understanding about the underpinning theory of MI including the nature of ambivalence and the humanistic perspective about what promotes behaviour change (conceptual knowledge) and learn about the strategies involved, such as procedures for evoking and strengthening change talk (technical knowledge). Declarative knowledge provides a foundation for procedural skills, but the intellectual insight contained within this system does not automatically translate to skilful practice (Binder 1999; Miller et al. 2004).

D.2 Procedural system

The procedural system draws on declarative knowledge and is concerned with the use of skills in practice, specifically, *how to* and *when to* use them (Bennett-Levy 2006). The input to the procedural system is patient communication, to which the clinician applies their *interpersonal perceptual skills*. The information is processed through both the self-schema (person of the therapist) and the self-as-therapist schema (therapist self, formed as therapy-specific skills are learnt). This informs the output of the procedural system, namely the clinician's communication (Bennett-Levy 2006; Bennett-Levy and Thwaites 2007).

The personal self (self-schema) and therapist self (self-as-therapist schema)

A distinction is made in the DPR model between the person of the therapist (self-schema) and therapist self (self-as-therapist schema) (Bennett-Levy 2006; Bennett-Levy and Thwaites 2007; Bennett-Levy et al. 2009b). The self-schema comprises 'the knowledge, attitudes, skills and personal attributes that have been established prior to becoming a therapist' (Bennett-Levy 2006 p. 65), which for existing clinicians will include those elements derived through professional training and clinical practice. Whilst some self-schema attributes may be compatible with MI (for example a caring and compassionate nature), others may be conceptually opposed to its principles and practice (for example a reliance on education and advice giving to promote change).

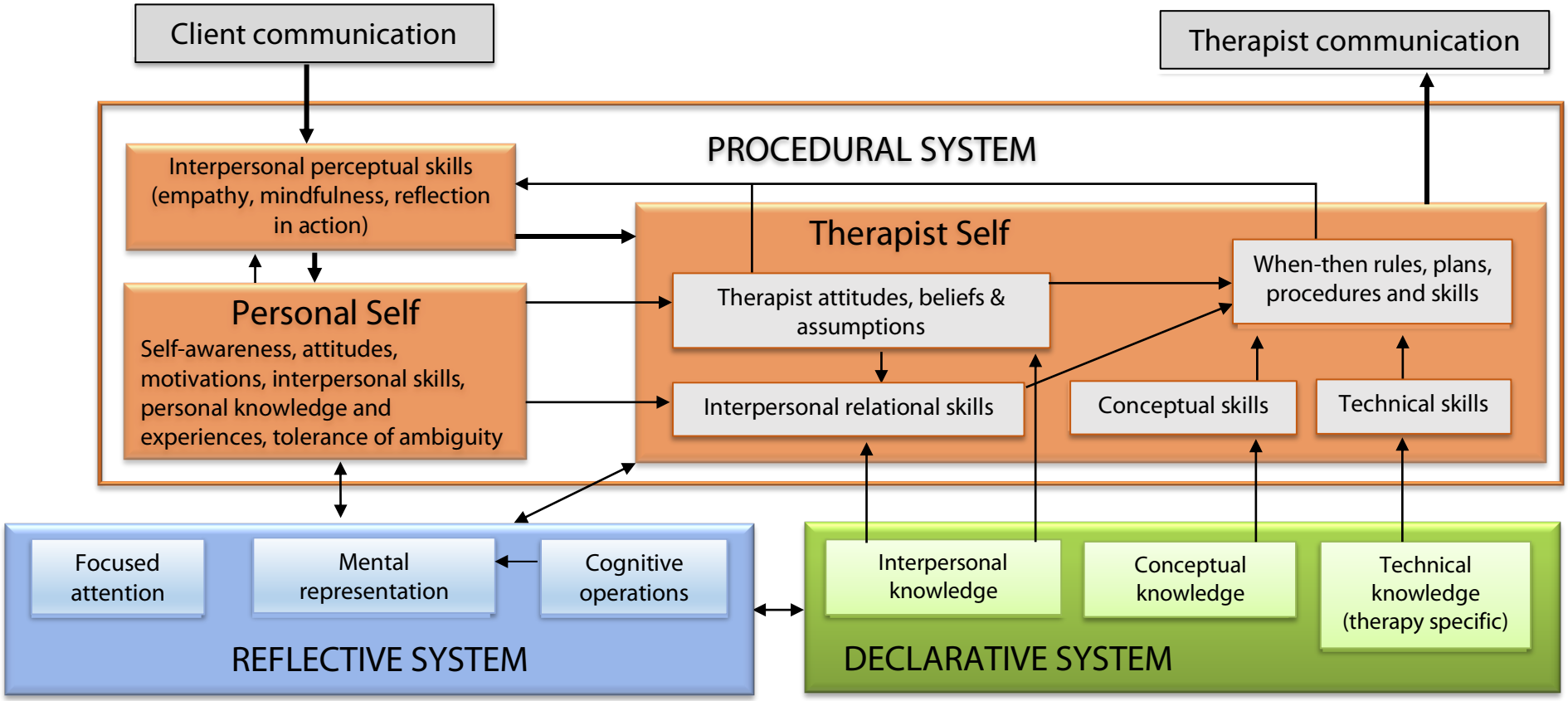


Figure D1. The declarative-procedural-reflective (DPR) model. Adapted from "Therapist skills: A cognitive model of their acquisition and refinement" by J Bennett-Levy (2006) *Behavioural and Cognitive Psychotherapy* 34(1): 57-78.

According to Bennett-Levy (2006), as clinicians undergo therapy training they develop a new therapist identity. This shares several properties with the self-schema (for example attitudes and beliefs about supporting people who are suffering and interpersonal relational skills) but also contains some unique elements (conceptual and technical knowledge and skills). As the learner develops therapy specific skills, there is a progressive transfer of the processing of patient communication from the self-schema to the self-as-therapist schema.

The constituents of the procedural system are described below.

Therapist attitudes, beliefs and assumptions

This element refers to "values, beliefs and assumptions about self, clients and the therapy process" (Bennett-Levy and Thwaites 2007 p. 260). The clinician's stance is considered fundamental to MI practice (Miller and Rollnick 2013) and is likely to impact both interpersonal perceptual skills (for example by directing the clinician's attention to particular aspects of the patient's communication) and their interpersonal relational skills (guiding how they talk to patients to develop and maintain a therapeutic relationship). At the novice stage of learning, therapist attitudes stem from the self-schema but are progressively informed through training focused on interpersonal declarative knowledge (Bennett-Levy 2006).

Interpersonal perceptual skills

Interpersonal perceptual skills enable the clinician to tune in to patient's verbal and non-verbal communication. In MI, they are used to understand patient's ambivalence and are central to MI's underlying spirit; enabling the clinician to be receptive to how the patient is responding to their counselling efforts (Miller and Rollnick 2013). Bennett-Levy (2006) describes three overlapping skills that contribute to this element of practice. The first is empathic attunement, which refers to a clinician's interest in and willingness to take the internal frame of reference of the patient in an attempt to understand their experience - the receptive element of accurate empathy as described by Rogers (1980). The second, mindfulness has been defined by Martin (1997 p.291-2) as "a state of psychological freedom that occurs when attention remains quiet and limber, without attachment to any particular point of view." In MI this involves listening non-judgmentally to both sides of the patient's ambivalence, without the clinician's hopes or expectations about what the patient should do interfering with the process. The third element, reflection-in -action (Schön 1991), is described as the skill possessed by expert therapists that enables them to process complex information about what the patient is saying and meaning in the moment and the ability to formulate helpful responses (Safran and Muran 2000).

Interpersonal relational skills, conceptual skills and technical skills

Interpersonal relational skills refer to the skills used to develop and maintain the therapeutic relationship. MI emphasises the use of reflective listening statements to communicate non-judgemental understanding of what the patient has said, meant, or felt. The aim of these is to create a safe atmosphere in which the patient feels comfortable exploring their ambivalence.

Conceptual skills refer to the implementation of conceptual knowledge in practice. In MI this involves being able to establish the basis of a patient's ambivalence. Technical skills are used to implement declarative technical knowledge. For example, using the typical day strategy to build rapport. Initially the skills feel awkward and demand considerable attentional resource from the novice. Through repeated practice and ongoing training support they become "relatively automatic and fluent" (Bennett-Levy 2006 p. 60).

When-then rules, plans, procedures and skills

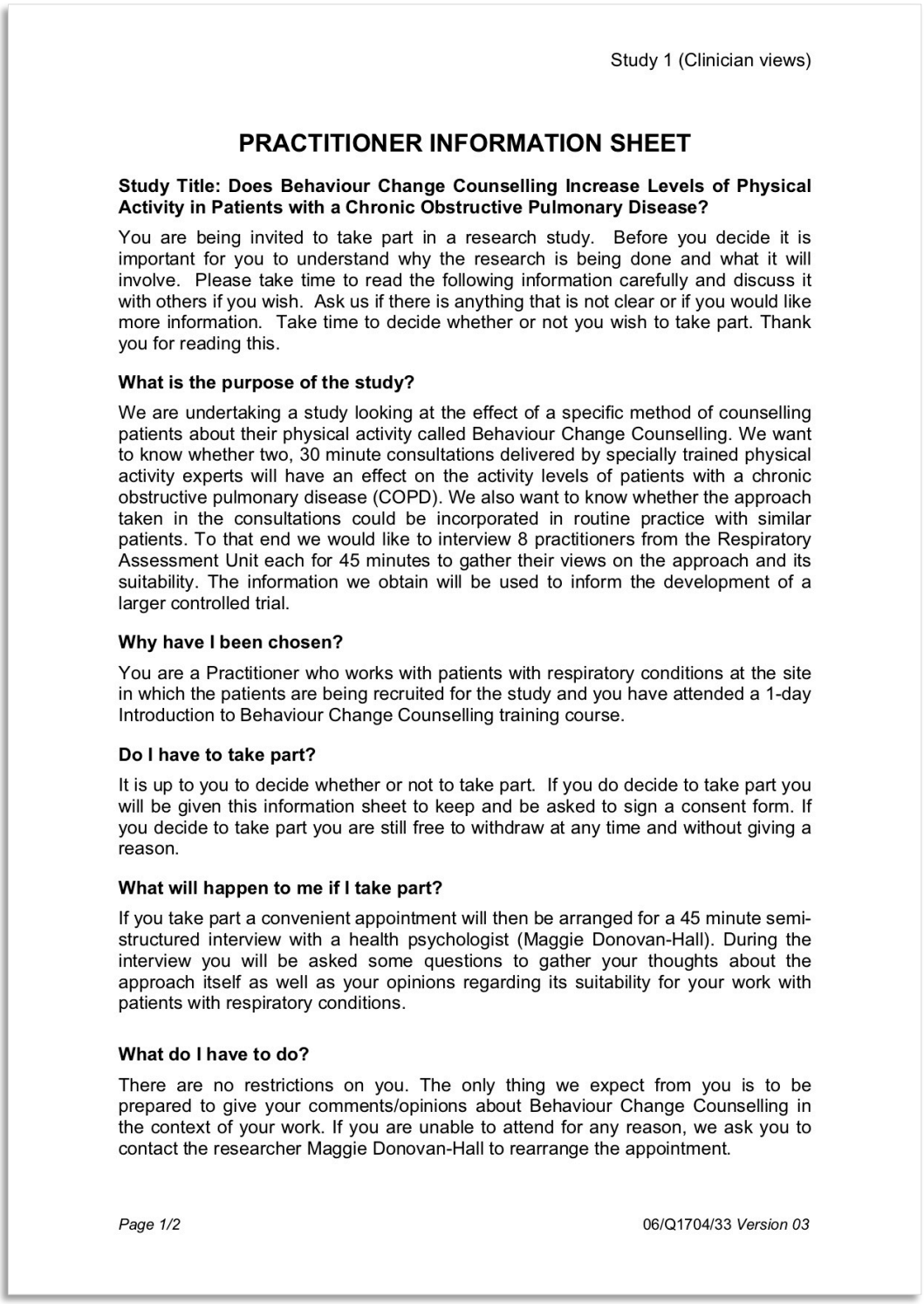
In the initial phases of learning, skills tend to develop in a mechanistic fashion. Through repeated practice and appropriate reflection, they become more refined and combined with facilitative attitudes to produce a highly contextualised set of *when-then rules, plans, procedures and skills*. These are flexible decision rules that indicate when and how particular strategies and skills should be used and are a hallmark of expert practice (Bennett-Levy 2006). They enable successful handling of complex cases in which therapists are required to act flexibly and respond appropriately when encountering unanticipated situations (Milne et al. 2001; Davis et al. 2015).

D.3 Reflective system

The third *reflective* system involves analysis and evaluation of practice. As described in the previous section, after a therapist has developed a basic fluency in the constituent skills, much of the subsequent improvement derives from the refinement and integration of those skills. This draws heavily on the reflective system and involves comparing past, current or future performance with information stored in the declarative and reflective systems (individually or during supervision).

Appendix E Participant information sheets and consent forms

E.1 Study 1



Study 1 (Clinician views)

PRACTITIONER INFORMATION SHEET

Study Title: Does Behaviour Change Counselling Increase Levels of Physical Activity in Patients with a Chronic Obstructive Pulmonary Disease?

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

What is the purpose of the study?

We are undertaking a study looking at the effect of a specific method of counselling patients about their physical activity called Behaviour Change Counselling. We want to know whether two, 30 minute consultations delivered by specially trained physical activity experts will have an effect on the activity levels of patients with a chronic obstructive pulmonary disease (COPD). We also want to know whether the approach taken in the consultations could be incorporated in routine practice with similar patients. To that end we would like to interview 8 practitioners from the Respiratory Assessment Unit each for 45 minutes to gather their views on the approach and its suitability. The information we obtain will be used to inform the development of a larger controlled trial.

Why have I been chosen?

You are a Practitioner who works with patients with respiratory conditions at the site in which the patients are being recruited for the study and you have attended a 1-day Introduction to Behaviour Change Counselling training course.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

What will happen to me if I take part?

If you take part a convenient appointment will then be arranged for a 45 minute semi-structured interview with a health psychologist (Maggie Donovan-Hall). During the interview you will be asked some questions to gather your thoughts about the approach itself as well as your opinions regarding its suitability for your work with patients with respiratory conditions.

What do I have to do?

There are no restrictions on you. The only thing we expect from you is to be prepared to give your comments/opinions about Behaviour Change Counselling in the context of your work. If you are unable to attend for any reason, we ask you to contact the researcher Maggie Donovan-Hall to rearrange the appointment.

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Note. For clarity, the focus of study 1 (clinician views) was the feasibility of motivational interviewing in its *pristine* form although the term 'behaviour change counselling' was used within the participant information sheet and consent form. At the time the study was conceived (and research governance approvals sought), the author had considered use of the term behaviour change counselling to be more appropriate for no other reason than the focus was on use by clinicians without specialist training in psychology and or counselling. On reflection, this was a mistake and the term motivational interviewing was used in the workshop and follow-up interviews. The discrepancy in terminology was discussed with clinicians during the workshop which they attended for prior to consenting to participate in the study.

What is being tested?

We are interested in finding out whether Behaviour Change Counselling influences the amount of physical activity people with a chronic obstructive pulmonary disease engage in. We also want to gather participants' and professionals' views about this approach.

What are the possible disadvantages and risks of taking part?

There are no risks of taking part in the interviews.

What are the potential benefits of taking part?

There are no benefits to you from participating in the feedback interview. The information we get will help guide our development of a larger controlled trial in the future.

What if something goes wrong?

If you have any concerns about the way in which you have been approached or treated, the normal University of Southampton complains mechanisms are available to you. Should you have any concerns, please contact Dr Anne Bruton who is the Research Supervisor for this project. Her telephone number is 02380 595283.

Will my taking part in this study be kept confidential?

The interview will be tape recorded but no names will be used in the discussion. The interviews will be analysed by a Health Psychologist from the University of Southampton (Margaret Donovan-Hall) who will use direct quotations from the discussion in the written reports about the study. However the quotations will be anonymous and no information which could be used to identify you will be used. All information about you which is collected during the course of the research will be kept strictly confidential.

What will happen to the results of the research study?

It is hoped that the results will be published after the end of the study. You will be sent a copy of the publications, but of course you will not be identified in the articles.

Who is organising and funding the research?

The research is being funded by the Wessex Medical Trust (Hope Charity).

Who has reviewed the study?

The study has been reviewed by the Southampton and South West Hampshire Research Ethics Committee B.

Contact for Further Information

If you would like more information about the study, please contact the Lead Researcher Rob Shannon on 02380 596804 or R.J.Shannon@soton.ac.uk

You will receive a copy of this information sheet and a signed consent form if you decide to take part in the study.

Thank you for your time.
Robert Shannon (version 03)

Study 1 (Clinician views)

CONSENT FORM

Title of Project: **Does Behaviour Change Counselling Increase Levels of Physical Activity in Patients with a Chronic Obstructive Pulmonary Disease?**

Name of Researcher: **Robert Shannon**

Please initial box

1. I confirm that I have read and understand the information sheet dated ..... (version .....) for the above study and have had the opportunity to ask questions. ☐

2. I understand that the feedback interview will be audio taped but that the tape will be anonymised and securely stored at the end of the research. ☐

3. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my employment or legal rights being affected. ☐

4. I agree to take part in the above study. ☐

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Name of person taking consent (if different from researcher)	Date	Signature
_____	_____	_____
Researcher	Date	Signature

06/Q1704/33 *Version 02*

E.2 Studies 2 and 3

Study 2 (Learning MI) / Study 3 (Trainee experiences)

Participant Information Sheet

Study Title: Training health professionals to use motivational interviewing to encourage exercise adherence as part of pulmonary rehabilitation.

Researcher: Robert Shannon
Ethics number: 11/SW/0358

I would like to invite you to take part in my research study. Before you decide I would like you to understand why the research is being done and what it would involve for you. Prior to making your decision I will go through the information sheet with you and answer any questions you have. If you are happy to participate you will be asked to sign a consent form.

What is the research about?
I am a Lecturer within the Faculty of Health Sciences, University of Southampton and am currently studying for a PhD, exploring the potential of a one-to-one counselling method called motivational interviewing for promoting exercise adherence as part of pulmonary rehabilitation. Studies show that motivational interviewing can be helpful in motivating patients to change health related behaviour and I want to see whether a package of training; involving a workshop, some coaching and feedback on practice, can help health professionals involved in pulmonary rehabilitation to learn to use motivational interviewing effectively. This research is being sponsored by the University of Southampton.

Why have I been invited?
I specifically want to involve health professionals who promote exercise and physical activity as part of pulmonary rehabilitation. You have been given this information sheet because your manager has identified you as someone who meets these criteria and may be interested in participating. The research involves a significant investment in time to attend the training days and undertake the follow-up coaching and feedback. By virtue of their issuing you with this information sheet, your manager has agreed to provide you with sufficient protected time (e.g. study leave) to enable you to complete each training component. I am hoping to recruit approximately 20 participants.

Do I have to take part?
It is up to you to decide to join the study. I will describe the study and go through this information sheet. If you agree to take part, I will then ask you to sign a consent form. You are free to withdraw at any time, without giving a reason. This would not affect your employment.

What will happen to me if I take part?
You will be asked to complete a short demographic information questionnaire which includes information about prior training in motivational interviewing and other counselling methods and then participate in a 2-day motivational interviewing workshop at a time convenient to you (at the location of one of the participating pulmonary rehabilitation programmes). Workshops will run from 9.30am-4.30pm each day and will normally be on consecutive days. The workshop will consist of a mixture of lectures, demonstrations, video analysis as well as exercises and role plays with coaching and feedback on your skills.

As part of the study, prior to the workshop you will be asked to upload to a secure website an audio-taped practice sample lasting at least 20 minutes of yourself talking with a patient who has been referred for pulmonary rehabilitation that demonstrates your normal way of working

to build motivation to exercise. The website will be partitioned and password protected such that only you and the researchers can access your recording. This can be immediately after the patient has been referred at the initial assessment, during the programme or after their programme has ended as part of a maintenance phase. You will be provided with a digital recording device for this purpose. Prior to the recording you will need to obtain written consent from the patient involved in the consultation using a form provided by the researcher and retain this in their treatment file. You will also be asked to record and upload three more practice samples, each using motivational interviewing to encourage patients to exercise; one immediately after the training workshop and the others 2 and 4 months later. These practice samples need not be with the same patient and like the first sample can occur at any point in pulmonary rehabilitation. As part of the study you will be prompted for these recordings ahead of their due dates. If it is not feasible for you to upload the practice sample recordings to the Sharepoint website, the researcher can arrange to visit your workplace to obtain each recording.

Shortly after submitting the 2nd and 3rd practice samples i.e. the post workshop and 2-month follow up samples, you will receive individualised feedback about your motivational interviewing skills. This will be available to you via the same secure password protected website to which you uploaded your audio-recording (or given to you in person if you elect not to, or are unable to use the Sharepoint web site). It will be followed up with a 30-minute one-to one discussion via telephone or face to face to suit you. This conversation will provide opportunities for discussion about the analysis of your motivational interviewing skills.

As part of the training you will also be offered 3 coaching sessions each lasting approximately 30-45minutes in months 1-2 after the workshop. This can be done on a one-to-one basis over the telephone or if you prefer in a small group at the venue of one of the participating pulmonary rehabilitation programmes. A reminder e-mail will be sent to you ahead of each scheduled teaching/learning activity.

The timing of each of the activities involved in the research is shown below. The workshop and coaching/feedback activities will be facilitated by the lead researcher, Rob Shannon who is experienced in delivering training in motivational interviewing. Considering each of these activities, the estimated investment of your time would amount to approximately 20 hours. Out of pocket expenses will be paid where they are incurred.

Timetable of activities

1-2 weeks prior to workshop		≤1 week post workshop	≤ 2 weeks of workshop	1-2 months post workshop	2 months post workshop	2.5 months post workshop	4 months post workshop
Submit baseline practice sample	2-day Workshop	Submit post workshop practice sample	Individual feedback on post workshop sample	3 x coaching calls/ meetings	Submit post coaching practice sample	Individual feedback on post coaching sample	Submit final follow-up practice sample

On completion of the motivational interviewing training, you will be invited to attend for a one-to-one semi-structured interview lasting approximately 30 minutes to gather your views about the motivational interviewing training and your thoughts about how it might be improved. The interview will be with a member of the research team who is not involved in the delivery of the motivational interviewing training and will take place at your normal work place.

Are there any benefits in my taking part?

Motivational interviewing has been shown to be an effective and efficient method for encouraging patients to change health behaviour in a number of problem areas and as a consequence, demand for training in it is high. The most common form of training is a one off-workshop, but evidence shows that often that in itself is not sufficient to develop and maintain the level of skill that makes a difference to patients. This study provides an opportunity to receive - free of charge – the type of individualised training that has been shown to lead to the proficiency in motivational interviewing in other professional groups. At the end of the study, each participant will receive a University of Southampton Certificate of Participation that can be used for continuing professional development purposes.

Are there any risks involved?

There are no significant risks associated with taking part in this training study. Some individuals experience mild anxiety when receiving feedback on their motivational interviewing skills, much like when learning any other clinical skill, but this is short lived.

Will my participation be confidential?

This research will be conducted in accordance with the Data Protection Act and the University of Southampton's research policy on the handling of personal data.

Participation in this study requires the support from your line manager and as such they will be aware of your involvement. The lead researcher will be responsible for the all aspects of the training including the analysis and feedback of your audio-taped practice samples. It is therefore not possible to retain your anonymity. A subset of practice samples will be analysed a second time by another member of the research team who is also accomplished in the assessment of motivational interviewing skills. This is being done to test whether the initial analysis has been done reliably. Your identity will not be disclosed to the person undertaking this and they will not be able to identify you from the tape recording itself. The analysis of your motivational interviewing skills will not involve documenting anything that you say during the consultations.

Your personal details (e.g. name, address) will be kept as a paper copy only and locked in a filing cabinet in the Lead Researcher's office. On joining the study you will be assigned a code and this will be used on all other materials including audio recordings and written documents (as opposed to your name). The anonymised data will be stored/inputted on a computer which will be password protected. The codes will be kept securely in a separate location. No identifying descriptions will be used in the write up of the research project and whilst quotes from your practice samples may be used in written reports about the study they will be anonymous and no information which could be used to identify you will be used.

What happens if I change my mind?
You have the right to withdraw at any time without giving any reason and without any consequence including to your employment. You reserve the right to decide whether the information collected from you up to the point you decide to leave can be used in the study.

What happens if something goes wrong?
If you have a concern or a complaint about this study you should contact Martina Prude, Head of Research Governance, at the Faculty of Health Sciences (Address: University of Southampton, Building 37/4055, Highfield, Southampton, SO17 1BJ; Tel: +44 (0)23 8059 5058; Email: M.A.Prude@soton.ac.uk). If you remain unhappy and wish to complain formally Martina Prude can provide you with details of the University of Southampton Complaints Procedure.

Where can I get more information?
If you would like more information about the study, please contact the Lead Researcher Rob Shannon on Tel: +44 (0)2380 596804 or email: R.J.Shannon@soton.ac.uk. You will receive a copy of this information sheet and a signed consent form if you decide to take part in the study. Thank you for your time. Robert Shannon.

Study 2 (Learning MI) / Study 3 (Trainee experiences)

Participant Identification Number for this trial:

CONSENT FORM (version 2.0)

Title of Project: Training health professionals to use motivational interviewing to encourage exercise adherence as part of pulmonary rehabilitation.

Name of Researcher: Robert Shannon

		Please initial box if you agree with the statement
1.	I confirm that I have read and understand the information sheet dated 12th March 2015 (version 2.2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2.	I understand that direct quotes from the audio-recorded consultations that I provide and the follow-up semi structured interview may be used in reports about this research but no names or information that could identify me will be used.	☐
3.	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my employment or legal rights being affected.	☐
4.	I understand that data collected during the study may be looked at by individuals from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.	☐
5.	I agree to take part in the above study.	☐

Data Protection

I understand that information collected about me during my participation in this study will be stored on a password protected computer and that this information will only be used for the purpose of this study. All files containing any personal data will be made anonymous.

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Name of researcher taking consent	Date	Signature

1 for Participant; 1 for researcher

Study 2 (Learning MI)

Patient Information Sheet

(Seeking Permission to Audio-Record your Consultation)

Study Title: Training health professionals to use motivational interviewing to encourage exercise adherence as part of pulmonary rehabilitation.

Researcher: Robert Shannon

Ethics number: 11/SW/0358

The health professional who is looking after you today is taking part in my research study. I am a Lecturer within the Faculty of Health Sciences, University of Southampton. My research involves testing the effect of a training course, which is designed to develop health professionals' ability to use a counselling method called motivational interviewing.

As part of this research, the health professional has been asked to provide audio-recordings of consultations they have with patients in which the topic of conversation is taking more exercise. You have been given this information sheet because you are either considering joining, or have already joined, a pulmonary rehabilitation programme. Your health professional would like to request your permission to audio-record your consultation for the purposes of the research.

Before you decide I would like you to understand why the research is being done and what having your consultation audio-recorded would mean for you. Prior to making your decision, your health professional will go through the information sheet with you and answer any questions you have.

Do I have to agree to have my consultation audio-recorded?
It is up to you whether to have your consultation recorded or not. If you decide against it, there will be no consequences for the care that you receive.

What will happen to me and my recording?
Your health professional will ask you to read and if you agree, sign a consent form. They will then audio-record the part of your consultation in which your thoughts and feelings about exercise are discussed. A digital recording device will be used for this purpose. This will last at least 10 minutes but will be no more than 45 minutes. All we ask you to do is to be yourself and to respond to the health professional as you would if the consultation was not being recorded.

As part of the study, the health professional has been asked to upload the recording to a secure website. The website will be partitioned and password protected which means that only the health professional and the researchers involved in the study can access the recording. Once this has been done, the recording will be permanently deleted from the recording device. The skills that the health professional uses during the consultation will then be analysed. Please note it is the effect of the training course on the health professional's skills that I am investigating, rather than the responses that you give during the consultation.

Are there any benefits in my consultation being recorded?
There are no benefits to your consultation being recorded, though we hope that the research itself will help our understanding of how health professionals learn motivational interviewing.

Are there any risks involved?
There are no significant risks associated with having your consultation recorded.

Will my participation be confidential?
This research will be conducted in accordance with the Data Protection Act and the University of Southampton's research policy on the handling of personal data.

As lead researcher, I will be responsible for the analysis of each recorded consultation. Your identity will not be disclosed to me and the health professional has been asked not to use your full name during the consultation or say anything else that might lead to you being identified. The analysis will not involve documenting anything that you say during the consultation. As part of the research, a subset of recordings will be analysed a second time by another member of the research team. Again, your personal details will not be passed to them.

The results of the analysis will be stored on a computer which will be password protected. Whilst quotes from the audio-recorded consultations may be used in reports about the research, they will be anonymous and no information which could be used to identify you will be used.

What happens if I change my mind?
You are free to stop the recording of your consultation at any time and are entitled to listen to it if you wish. If you decide that you are not happy for the recording to be used, it will be permanently deleted. You do not have to give a reason for this and there would be no consequence including to the care that you receive.

What happens if something goes wrong?
If you have a concern or a complaint about this study you should contact Martina Prude, Head of Research Governance, at the Faculty of Health Sciences (Address: University of Southampton, Building 37/4055, Highfield, Southampton, SO17 1BJ; Tel: +44 (0)23 8059 5058; Email: M.A.Prude@soton.ac.uk). If you remain unhappy and wish to complain formally Martina Prude can provide you with details of the University of Southampton Complaints Procedure.

Where can I get more information?
If you would like more information about the study, please contact the Lead Researcher Rob Shannon on Tel: +44 (0)2380 596804 or email: R.J.Shannon@soton.ac.uk. You will receive a copy of this information sheet and a signed consent form if you decide to have your consultation recorded.

Thank you for your time.

Robert Shannon.

Study 2 (Learning MI)

PATIENT CONSENT FORM (version 1.1)

Title of Project: Training health professionals to use motivational interviewing to encourage exercise adherence as part of pulmonary rehabilitation.

Name of Researcher: Robert Shannon

		Please initial box if you agree with the statement
1.	I confirm that I have read and understand the information sheet dated 16/01/2012 (version 1.0) relating to my consultation being audio-recorded as part of the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2.	I understand that direct quotes from my audio-recorded consultation may be used in reports about this research but no names or information that could identify me will be used.	☐
3.	I am voluntarily agreeing to have my consultation audio-recorded. I understand that I am free to stop the recording at any time or ask to listen to the recording.	☐
4.	I understand that I can decide to withdraw my consent for the recording to be used, without giving any reason, without my care or legal rights being affected. I understand that if I withdraw consent, the recording will be permanently deleted from the recording device.	☐

Data Protection

I understand that the audio-recorded consultation will be stored on a password protected computer and that this will only be used for the purpose of this study. To protect my identity, this consent form will not be returned to the researcher instead, it will be stored in my patient record file.

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Name of Health Professional taking consent	Date	Signature

Rob Shannon Learning MI Patient Consent Form _ version 1.1 _ 21st February 2012.doc

Study 2 (Learning MI)

CONFIRMATION THAT PATIENT CONSENT FOR RECORDING CONSULTATION HAS BEEN GAINED

Study title: Training health professionals to use motivational interviewing to encourage exercise adherence as part of pulmonary rehabilitation

I confirm that prior to audio recording the .....* consultation on ..... (date) as part of the above titled study, I declare that I obtained permission from the patient in writing using the information sheet and consent form provided for this purpose and confirm that this has been stored in keeping with the study protocol.

_____	_____	_____
Name of Participant	Date	Signature

*Indicate whether this is the baseline, post-workshop, post coaching or 4-month follow-up practice sample.

Rob Shannon Learning MI Confirmation of patient consent for recording_ 16th Dec 2011.doc

Appendix F Study 1: Introduction to motivational interviewing in respiratory contexts workshop aim, learning outcomes and content

F.1 Overall aim

To equip participants with a basic knowledge of the spirit and processes of MI and provide opportunities to practise some of the key skills.

F.2 Learning outcomes

1. Describe an MI conceptualisation of engagement and adherence issues in respiratory contexts.
2. Describe the fundamental spirit and processes of MI.
3. Provide opportunities to practise empathic counselling skills.
4. To understand and practise some of the directive aspects of MI that are relevant to behaviour change discussions in respiratory contexts.
5. Describe the patient language cues ('change talk', 'sustain talk' and "discord") that provide continued feedback and enable continuous learning in practice.

F.3 Workshop content

Type	Subject	Focus	Time (minutes)
Discussion	Workshop introduction	Introductions, aims and learning outcomes, participant expectations and hopes.	20
Mini-lecture	Background Philosophical, conceptual issues	Common assumptions about why people don't adopt healthy lifestyles MI conceptualisation of engagement and adherence issues in respiratory contexts (ambivalence: *'I know I should, but I don't want to'*).	30
Experiential Exercises	Contrasting deficit versus competence perspectives on motivation	Contrasting ways to handle patients' ambivalence – advice giving/persuasion versus listening and evoking: *Exercise #1 Persuasion role play* Feedback of patient and clinician's experiences in plenary. Discussion: why do people resist our good advice? Righting reflex, resistance, the need to be understood and accepted, the significance of patient language.	60

Type	Subject	Focus	Time (minutes)
		Preparation for exercise #2 Recognising change talk: brief introduction followed by 'drumming for change exercise'. Empathic listening: Using reflective listening to convey empathy and to develop the patient's own arguments for change. Brief introduction. *Exercise #2 Listening and evoking real play.* Feedback of speakers' and listeners' experiences in plenary. Discussion: contrasting approaches.	
Break			20
Mini-lecture	MI framework: definition, spirit and processes	Overview of the aims, overall style of working, principles of practice and processes involved in MI.	20
Video analysis	MI-consistent practice	Participants watch video focusing on overall style of working, skills involved and change talk that emerged. Discussion: Feedback on observations.	30
Lunch			45
Mini-lecture	Core skills	Core skills that underpin conversations about behaviour change: Asking good open-ended questions; Affirming – noticing and commenting on effort, strengths, determination; Reflective listening to convey empathy; Summarising the discussion.	15
Skill building exercises	Core skills	Question quiz. Reflective listening exercise i) thinking reflectively -hypothesizing meaning ii) forming reflections iii) levels of reflection.	45
Break			20

Type	Subject	Focus	Time (minutes)
Mini-lecture, demo. followed by skill building role-play/real play	Example strategies	i) Raising the subject of behaviour change/setting the scene and engaging using the typical day strategy. ii) Using evoking skills to build importance and confidence for change. Identifying, elaborating and reinforcing talk about changing behaviour. iii) Sharing information in an MI style.	60
Mini-lecture followed by skill building exercise	Responding to resistance	Minimising defensiveness and responding to it when it does occur.	30
Discussion	Reflection	Participants feedback on their experience of MI Discussion regarding potential implications for practice.	15
Finish			

Appendix G Study 1: Semi-structured interview guide

Study 1: semi-structured interview guide

What are the key things that you remember from the workshop?

What do you consider to be the strengths of the approach in relation to the work that you do?

What do you see as its limitations?

In what way (if at all) has it influenced the way you think about or approach behaviour change conversations with your patients?

To what extent do you feel that motivational interviewing should be integrated into routine practice within respiratory care?

What do you think would be the challenges to your adopting this approach and delivering it within your practice?

What training requirements do you foresee as necessary to enable you to deliver motivational interviewing effectively?

Appendix H Study 1: Audit trail

Study 1 audit trail

Table H-1 provides a summary of the audit trail for study 1 (clinician views). The audit trail provides information regarding the step-by-step analytical decisions that were made and the reasoning behind them. This allows the reader to verify the researcher's activities and follow his interpretations. Reflexivity represents a fundamental element of the audit trail. A reflexive account provides a critical account of the author's actions and acknowledgment of the impact of potential biases on the decisions made (Yardley 2015).

Table H-1 *Components of Study 1 (Clinician Views) Audit Trail*

Phase	Audit trail relating to process
1. Data familiarisation	Table summarising initial ideas (section H.1)
2. Generating initial codes	Coding list developed through phase 2 and reflection on process (section H.2)
3. Searching for themes	Initial thematic map (section H.3)
4. Reviewing themes	Description and rationale for changes made to derive the final thematic map (section H.4)
5. Defining and describing themes	Presentation of final thematic map with summary of each theme (section H.5) Reflexive account (section H.6).

Note. Adapted from "Using thematic analysis in psychology" by V Braun and V Clarke (2006). *Qualitative Research in Psychology* 3(2): 77-101.

H.1 Phase 1: Data familiarisation

Initial ideas post transcribing

My initial ideas formulated through the process of transcribing the semi-structured interviews are summarised in Table H-2. The table also contains what I considered to be key points from participants' accounts that define and describe those basic ideas.

Table H-2 *Study 1: Initial Ideas Post Transcribing*

Idea	Key points
Requirement for on-going support	Follow-up training needed Modelling is important Contextualised/supervision helpful Taster training not enough A supportive encouraging tone is important.
Congruence with current approach	Variation in extent to which MI perceived to differ from current practice Most recognised patient-centred aspect (though their description of patient-centred not always MI-consistent) Personally/professionally challenging
Concern re: mastery	MI is complex Deceptively simple Learning is challenging Feels awkward at first Strong righting reflex Antithetical to pre-registration training previously received "Hope I don't slip back" Concern about alienation of patients
Positive experience when trying skills in practice.	Training stimulated reflection on practice See a different, more compliant patient when skills are used
Useful	Patients have many barriers to increasing physical activity – breathlessness, anxiety, self-image

Idea	Key points
Implementation challenges at clinician level	Strong righting reflex
	Experience and training in methods that run counter to MI
	Actively listening is novel
	Perception of role – focus on physical not psychological (closed questions to maintain control and keep focus on comfortable, manageable terrain).
	Talking as therapy
What does MI represent?	Many said they do a lot of it already – but seeing it modelled would be helpful, that they use too many closed questions and too few reflective listening statements (failure to understand or inflated self-efficacy?)
	Promoted clinicians to reflect on previous counselling habits
Challenges involved in encouraging behaviour change	Patients too talkative
	Patients become defensive
	Service design pressures (time, competing tasks, need to fix patients)
	Practical issues – interruptions, lack of quiet
	Patients' expectations for therapist to 'fix' – lack of responsibility
What is MI?	Varying degrees of focus – most on relationship but few on facilitating more advanced aspects such as facilitating client self-exploration
	Most finished by saying it is different
Flexible counselling style	Need to recognise when MI is appropriate and for whom
Impact of training on clinician	Made sense
	Stopped me finger wagging

H.2 Phase 2: Generating initial codes

Coding list

Following transcription, I systematically coded the entire data set on a line-by-line basis. Table H-2 contains the final set of codes that were assigned to chunks of data (words, sentences or paragraphs).

Table H-2 *Study 1: Initial Codes*

Initial codes derived from line-by-line analysis of transcripts	
Training enjoyable	Previous practice based on information and advice
Difficult to learn / involves effort	Previous practice based on closed questioning
Confidence to try it out	Lack of time triggers advice giving
Do some of it already	Previous teaching interferes
Somewhat consistent?	Time is an issue
(we do) patient-centred practice	Multiple tasks in consultations
Developed existing skills	Quiet needed
MI is different	Efficiency (long term)
Useful addition	Professional role
MI made sense	Barriers to use (patients)
Thinking about process of interview	Supportive learning environment
Applications of MI	Role play helpful
Blending	Role play false
Listening versus advising	Supervision
Listening is key	Modelling required
Supressing righting reflex	Refresher/further training
Limitations of information/ advice	Patient capacity for change
Tried (with success)	Helping patient change for own reasons
Surprised by positive outcome	Patient barriers to change behaviour
Select which patients to use it with	View of patients
Encouraging self-exploration	Attribution for patient change

Initial codes derived from line-by-line analysis of transcripts	
Autonomy respect	Can MI accelerate change process?
Extra time/approach leads to improved outcomes	Won't change unless they want to
Relationship building	

Reflection on process

Coding data was a challenging process. I attempted, where possible and appropriate, to code abstractly (that is capturing meaning rather than what was stated explicitly). As Howitt (2013) suggested this helps with theme development. However, there were several instances where the explicit content could be interpreted in several ways (suggesting that further clarification could have been gained during the interview). The constant comparison strategy was helpful, but my uncertainty regarding the meaning of some 'chunks' meant that I often vacillated when assigning a code. There were several instances where I revised the code I had initially assigned because I inferred a different meaning on the second read. On other occasions I made a new code because the original did not fit the data well enough. When this happened, I revisited previously coded material to check whether the new code was more appropriate. Checking, re-checking and where necessary consulting with my supervisor for a second opinion was time consuming but was necessary to ensure accuracy of interpretation.

An example of the difficulty is provided below in which I was not clear as to the extent that participant 2 believed she was using MI consistent skills MI prior to the workshop.

Interviewer asks:

> *"Thinking back to how you would have dealt with these patients before the training day and to how you would deal with them now can you see any changes?"*

Participant responds:

> *"I'm going to have to be very frank here and say not an exceptional amount because I've been dealing with them for a long time, I did a counselling course some years ago and that taught me quite a lot."*

When the interviewer subsequently suggested to her that she might have been using some elements of MI in her practice prior to the course, her response was:

"Yeah, probably not in the way it was completely phrased or [workshop facilitator] put it across but yes, I think, and it's personal that I ask too many closed questions and not open questions but I do allow the patient to talk quite openly and freely. I have to say that there are certainly lots of aspects that we could use, Behaviour Change Counselling very easily in our practice, if we had more time available to do it." .

Reflecting on this I have taken her initial comment to mean that through experience and prior counselling training, she has developed her own way of counselling that she is satisfied with and has found helpful in working with respiratory patients. It also appears that the 1-day workshop was not sufficient for her to determine exactly how MI differs from her routine practice, and therefore needs more insight prior to making direct comparisons. So, the initial comment regarding no perceived need to change practice based on the workshop, reflects the fact that she already uses a form of counselling in her work and a lack of understanding as to exactly how MI differs. That is not to say that she perceives no benefit from the specific skills that were covered in the training.

H.3 Phase 3: Searching for themes and sub-themes

Initial thematic map

Several iterations of the thematic map were produced through the analysis. The first version is shown in Figure H1.

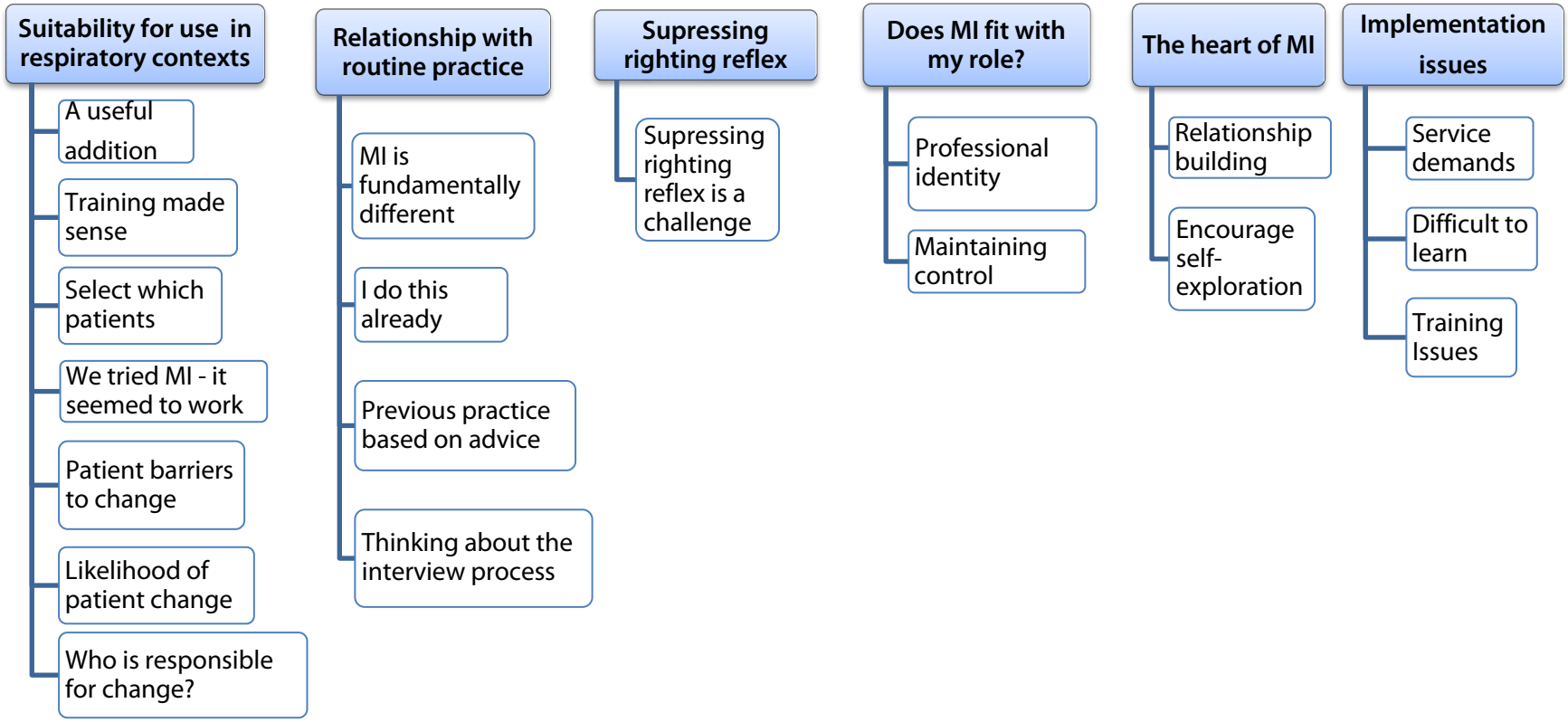


Figure H1. Study 1: Initial thematic map

H.4 Phase 4: Reviewing themes

The final thematic map is shown in figure H2. What follows is a description and justification for the changes that were made to the initial attempt to derive the final version.

Theme 1: Suitability for use in respiratory contexts

Summarising the key meaning of each theme was helpful in determining the fit of each sub-theme and the degree of external heterogeneity across themes. There was significant overlap between the sub-theme 'Training made sense' (within Theme 1) and the sub-theme 'MI is fundamentally different' (within Theme 2). The material related more to participant's perception that MI is antithetical to their normal practice and so was transferred to that sub-theme.

The review also revealed a need to revise and refine other sub-themes within theme 1. Material within 'Patient barriers to change' and 'Select which patients' were subsumed within the sub-theme 'Useful addition' given the overlap. The former reflected participant accounts of the difficulties faced by patients with respiratory conditions when changing health related behaviour and the perceived value of MI for addressing those issues. The later captured the perception that MI would be more useful for discussing behaviour change issues than for addressing acute medical problems.

I omitted the sub-theme 'Likelihood of patient change' since the material did not seem to reflect anything particularly important in relation to the research objectives that was not otherwise captured.

Finally, the sub-theme 'Who is responsible for change' was removed. This was an example of my having tried to fit the data to my preconceived ideas about what I had hoped the training would promote (specifically insights into competence world view and implications for clinicians evoking patient motivation rather than installing it). On reviewing the content of participant quotes linked to this sub-theme, it was apparent that it did not constitute a substantive element. We discussed this tendency of mine during supervision and the importance of being guided by the data.

Theme 2: MI's relationship with routine clinical practice

The review of themes revealed there was overlap between select sub-themes within Theme 2. The sub-themes 'MI is fundamentally different' and 'Previous practice based on advice' were ostensibly describing the same issue albeit expressed in different ways. The first contained quotes in which participants had explicitly stated there was a difference between MI and their

normal practice, whereas the second the difference was implied through the description of advice giving, education and persuasion as the main methods employed in routine practice. I elected the collapse the two sub-themes and retain the title of the first. The sub-theme thinking about the interview process did not include material that was directly relevant to the research questions and so was omitted from the final thematic map.

Theme 3: Supressing the righting reflex

There appeared to be a high degree of overlap between the content of the theme 'Supressing the righting reflex' and the themes 'Is MI different?' and 'Suitability for use in respiratory contexts'. I was unsure as to whether it was sufficiently different to constitute a theme in its own right or should be integrated in the service of increasing external heterogeneity.

When I carefully re-read the participant quotes relating to 'Supressing the righting reflex' and the context in which they are uttered, it became clear that focus was on how participants saw MI as being different from the skills they use in routine practice. It therefore fits with the theme 'MI's relationship with routine practice'. One exception is the comment made by participant 6 who discussed it in relation to not wanting to slip back to previous habits of counselling.

"I just hope I continue to use and that my own reflex, righting reflex, and my own previous assessment techniques don't just slip back in as a bad habit, you know, I am worried that I will get one tired week or one bad week and start going back to how I was before."

Though this quote refers to the righting reflex, it fits best with the theme 'Suitability for use in respiratory contexts', because it evidences the value the participant places on MI.

Based on these changes, the Theme 'Supressing the righting reflex' was removed.

Theme 4: Does MI fit with my role?

I wondered whether 'Does MI fit with my role' stood up as a theme in its own right. The main reason was because the ideas were based on only two participants' views. It focuses on the way in which these participants perceive their role and concerns that use of MI might threaten their sense of control in consultations. Whilst the material could conceivably fit with the theme 'Suitability for use in respiratory contexts', I felt it deserved the status of a theme since the content gives important insights into factors that might undermine clinicians' engagement with MI training and use of MI in practice. Moreover, issues of professional identity and control have emerged as important themes in other qualitative research on the use of MI in practice, which reinforced this decision.

Theme 5: The heart of MI

This theme was removed for the final thematic map as the content, which was about perceptions of what MI is, was not directly relevant to the research questions. More pertinent was the material about the implications for learning and adoption, which were captured within other themes.

H.5 Phase 5: Defining and describing themes

The final thematic map is shown in figure H2. In the next section is a summary of the constituent themes.

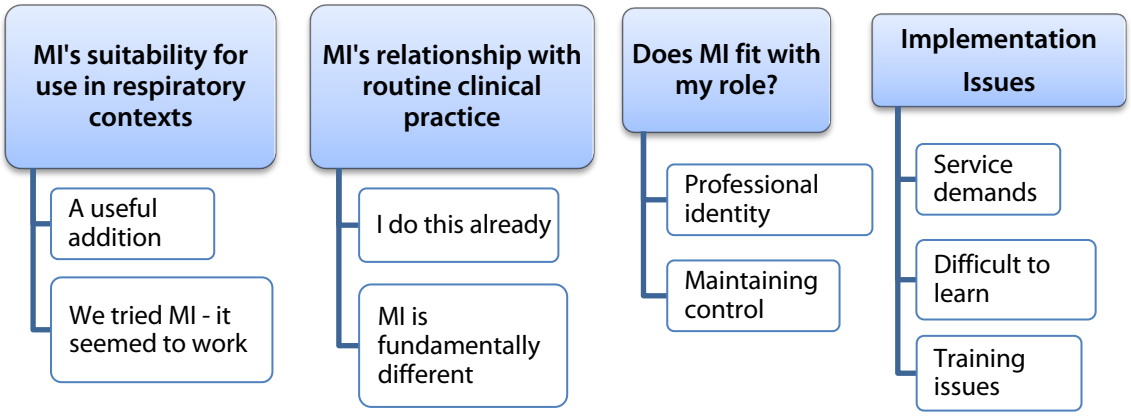


Figure H2. Study 1: Final thematic map

Summary of each of the themes in the final thematic map

Theme 1: Motivational interviewing's suitability for use in respiratory contexts

Participants consistently viewed MI as being helpful for addressing common barriers to behaviour change in respiratory contexts. It was also seen as being useful for pre-empting/reducing patient hostility. Though it was not the original intention of the research, several participants tried out some of the MI skills they had been taught following the workshop with encouraging results.

Theme 2: Motivational Interviewing's relationship with routine clinical practice

Differences were observed across participants in the extent to which MI represented a different style of working to their normal practice. Some perceived their current practice to be consistent

with MI in its style and use of specific skills, where others saw MI as being fundamentally different. Most participants described their practice as patient-centred and consistent with MI, though the way they defined being patient-centred varied. Some participants indicated that they used elements of MI, but their description of practice showed only a vague similarity. The workshop was not successful in helping these clinicians to see the refined nature of the skills used in MI.

Theme 3: Does motivational interviewing fit with my role?

Physiotherapy participants in particular described their professional identity as having its roots in a medical model, with practice that is typically focused on physical parameters. Closed questions are used to maintain control, and to keep consultations on familiar, comfortable terrain. This also serves a practical purpose, in preventing consultations from running over time. Psychosocial matters were perceived to be more ambiguous and take longer time to resolve. Confidence is required to 'allow' conversations to cover psychosocial matters. As a consequence, these factors may influence the use of MI in practice.

Theme 4: Implementation issues

Service demands were perceived to undermine attempts to implement MI, with a lack of patient contact time featuring consistently. The initial 1-day workshop was well received and the value of a safe and supportive learning environment was emphasised by some. A consistent theme was that MI is difficult to learn and that the 1-day workshop provided an insight into MI and a framework for analysing interactions with patients, but that more training was required to develop proficiency. Refresher days, live supervision on practice, and modelling were suggested forms of follow-up training. Participants indicated the need to integrate MI with other clinical skills and tasks and so training would need to cover how to switch flexibly between MI and other styles of working.

H.6 Personal reflexive account

To maximise the credibility of the research, an important question to ask is whether my interest, expertise and investment in MI is influencing my interpretation of interview data?

Have I selectively attended to the feedback that is favourable and supportive of MI?

Participants consistently viewed MI positively. To pre-empt potential bias in the analysis, I re-read interview transcripts after drawing this conclusion to look for contradictory evidence. Whilst clinicians cited several issues that might make learning MI difficult (e.g. strong righting

reflex) and barriers to the use of MI in practice (e.g. lack of time, role perception), it was universally described as being useful to their work. I ensured that the caveats described above were adequately represented in the results section in the final report (see section 6.4, page 148).

Re: 'Motivational interviewing's relationship with routine clinical practice' theme

Question: How do I reconcile participants' perception that they are already using MI with their descriptions of practice that suggest behaviours which are clearly antithetical to MI?

Reflection: The focus of the research is clinician participants' perception of the MI workshop/content rather than a test of what they know/don't know. The aim of the analysis should be on making sense of participants' experience. To do this it is necessary to think carefully about what level of insight someone might reasonably be expected to gain from a one-off workshop. MI is complex and a failure to appreciate the refined nature of key skills and processes and how it differs from routine practice is quite normal after such limited input.

Are my expectations regarding the level of insight that can be gained from a 1-day workshop realistic?

This is an important issue, because it has the potential to influence my interpretation and description of the interview data relevant to Theme 2: Motivational interviewing's relationship with routine clinical practice. Several clinicians indicated that they were using MI (or elements of it) prior to the workshop but described practice that was either antithetical to it or did not capture the essence of MI or refined use of skills. I believe that it is important to preserve the integrity of the approach and am quite 'protective' in this regard. Consequently, there is the potential to become frustrated when people say they use MI, when in fact, they do not.

I found it particularly helpful to think carefully about the limitations of a one-off workshop for conveying the complexities of MI and providing insights as to how MI might differ from routine practice. It would be reasonable to expect participants to leave a short workshop with little more than a cursory insight into the philosophy and practice of MI. Consideration of this, together with my bias (to protect the integrity of MI) helped me to reformulate the significance of participant assertions that they already use MI in their practice. That some participants believed they were using MI already should not be wholly unexpected because the skills involved in MI are simply refined versions of those used in everyday practice. Participants may recognise the skill, but not the specific, refined way they are used, or the strategy and spirit that guide their specific application (see "Ten things that motivational interviewing is not." by Miller, W. R. and S. Rollnick, 2009. Behavioural and Cognitive Psychotherapy 37: 129-140). I therefore re-

attributed the conclusion drawn by participants to a limitation of the workshop rather than anything to do with the participants.

Appendix I Study 2: Participant demographic questionnaire

UNIVERSITY OF Southampton

PARTICIPANT DEMOGRAPHIC QUESTIONNAIRE

Study title: Training health professionals to use motivational interviewing to encourage exercise adherence as part of pulmonary rehabilitation.

1. Date of birth (dd/mm/yyyy) .....
2. Profession .....
3. Time as a registered health professional ..... (years / months)
4. Duration of involvement in delivering pulmonary rehabilitation ..... (years) ..... (months)
5. Prior training in MI
    a. Total hours .....
    b. Type of training (tick all that apply)

    ❒ Lecture ❒ Role plays ❒ Skill building exercises ❒ Feedback on practice

    ❒ Coaching

    ❒ Other (please describe) .....

6. Prior training in other forms of counselling
    a. Type of counselling .....
    b. Total hours .....
    c. Type of training (tick all that apply)

    ❒ Lecture ❒ Role plays ❒ Skill building exercises ❒ Feedback on practice

    ❒ Coaching

    ❒ Other (please describe) .....

Appendix J Study 2: Motivational interviewing training package - Aim, learning outcomes and content

J.1 Overall aim

To learn the basic clinical style of motivational interviewing (MI) and how to continue learning it in practice.

J.2 Learning outcomes (workshop)

1. Describe a MI conceptualisation of sub-optimal engagement with pulmonary rehabilitation (PR).
2. Describe the fundamental spirit and processes of MI.
3. Strengthen empathic counselling skills.
4. Practise a series of MI strategies that seek to enhance motivation and commitment to PR.
5. To experience and practice an MI style for handling sustain talk and discord.
6. Receive coaching and feedback on MI skills.
7. Describe the patient language cues (change talk, sustain talk and discord) that provide continued feedback and enable continuous learning in practice.

J.3 Workshop Content

Day 1

Type	Subject	Focus	Time (minutes)
Discussion	Workshop introduction	Introductions, aims and learning outcomes, participant expectations and hopes.	20
Exercise	Exploring natural helping responses	Participants complete Helpful Responses Questionnaire to establish natural 'helping' responses to patient defensiveness and arguments against change (for review during day 2).	10
Mini-lecture	Background Philosophical, conceptual issues	Common assumptions about why people don't adopt healthy lifestyles (deficit model of motivation). A MI conceptualisation of sub-optimal engagement and adherence within PR (competence worldview and ambivalence).	30

Type	Subject	Focus	Time (minutes)
Experiential Exercises	Contrasting deficit versus competence perspectives on motivation	Contrasting ways to address patient ambivalence – advice giving/persuasion versus listening and evoking exercises. *Exercise #1 Persuasion role play* Feedback of patient and clinician's experiences in plenary. Discussion: why do people resist our good advice? Righting reflex, resistance, the need to be understood and accepted, the significance of patient language.	25
Break			20
Experiential Exercises (continued)	Contrasting deficit versus competence perspectives on motivation (continued)	Preparation for exercise #2 Recognising change talk: brief introduction followed by 'drumming for change exercise' to develop skill in recognising change talk in conversations. Empathic listening: Using reflective listening to convey empathy and to make salient patients' own arguments for change. Brief introduction. *Exercise #2 Listening and evoking real play* Speakers and listeners feedback experiences in plenary followed by discussion.	35
Mini-lecture	MI framework: definition, spirit and processes	Overview of the aims, overall style of working, principles of practice and processes involved.	20
Video analysis	MI-consistent practice	Participants watch video focusing on overall style of working, skills involved and change talk that emerged. Discussion: Feedback on observations.	30
Lunch			45
Mini-lecture	Core skills	Core skills that underpin conversations about behaviour change: Asking good open-ended questions; affirming – noticing and commenting on patients' effort, strengths, determination; reflective listening to convey empathy; summarising the discussion.	15
Mini-lecture followed by skill building exercises	Core skills	Question quiz. Summarising exercise (including affirmation as part of feedback). Reflective listening exercises i) thinking reflectively -hypothesizing meaning ii) forming reflections.	90
Break			20

Type	Subject	Focus	Time (minutes)
Skill building exercises	Core skills	Reflective listening exercises continued iii) levels of reflection.	30
Mini-lecture and demo. followed by role play/ real play	Strategies to enhance engagement and adherence in PR	Setting the scene. Agreeing an agenda. Eliciting the patient's story. Participants work in pairs, deciding whether to experiment with strategy in a real or role-play context. Feedback and coaching on practice provided.	60
Discussion	Day 1 reflections	Participants feedback on their experience of MI and key learning achieved.	15
Finish			

Day 2

Type	Subject	Focus	Time (minutes)
Discussion	Day 1 reflections	Address issues raised from day 1. Introduce day 2 content and focus.	15
Mini-lecture followed by skill building exercise	Core skills	Exercise: Evoking change talk *Here's the answer – what's the question?* – to practice asking different open-ended questions to elicit change talk and learn about the linkage between the two.	20
Mini-lecture and demo. followed by role play/ real play	Strategies (continued)	Exploring motivation and confidence for increasing physical activity. Participants work in pairs, deciding whether to experiment with strategy in a real or role play context. Feedback and coaching on practice provided.	50
Break			20
Mini-lecture followed by skill building exercise	Core skills	Exercise: Reinforcing and strengthening change talk. *Snatching the change talk from the jaws of ambivalence* – to practice selective reinforcement of change talk in the context of ambivalence through reflective listening.	20

Type	Subject	Focus	Time (minutes)
Mini-lecture and demo. followed by role play	Strategies (continued)	Exploring hopes and fears for PR. Participants work in pairs for role-play - alternating between patient and clinician roles. Feedback and coaching on practice provided.	30
Review, discussion mini-lecture and exercise	Core skills	Responding to sustain talk and discord. Review Helpful Responses Questionnaire (from day 1). Exercise: Batting Practice – to practice different ways to respond to sustain talk and discord.	40
Lunch			45
Mini-lecture and demo. followed by role play	Strategies (continued)	Eliciting commitment. Problem solving practical and psychological barriers to engagement with pulmonary rehabilitation. Participants work in pairs for role-play - alternating between patient and clinician roles. Feedback and coaching on practice provided.	40
Discussion	Application of strategies across different stages of PR	Discuss how learning may be applied during programme and follow-up consultations.	45
Break			20
Role play	Skill building exercise	Putting it all together. Participants try out all strategies in sequence either in pairs or using a 'fish-bowl' approach with several participants sharing the role of a clinician to reduce burden for each person. Feedback and coaching provided.	60
Discussion	Day 2 reflections Next steps	Participants feedback on their experience of MI and key learning achieved. Planning for recording/submitting practice samples and coaching activities.	45
Finish			

J.4 Learning outcomes (feedback and coaching)

1. To receive individual objective feedback regarding MI practice.
2. To receive coaching on MI skills and provide opportunities to problem solve difficulties experienced whilst integrating MI skills in practice.

J.5 Feedback session content

Objective feedback on practice was based on analysis of audio-recorded patient consultations using the Motivational Interviewing Treatment Integrity coding system (MITI 3.1.1) (Moyers et al. 2010) with comparisons made between actual practice and basic competency targets. These ono-to-one sessions began with participant describing what went well in the session and what could be improved. The insights were augmented where appropriate with MITI-based feedback. The focus then turned to addressing development needs through discussion and skills-building exercises. A review of the recorded practice sample itself was often used to support the discussion. A written report was provided after the session to summarise key points.

J.6 Coaching session content

Coaching sessions took different forms but generally provided positive reinforcement and opportunities for problem-solving difficulties the participant had experienced whilst using MI. Sessions also involved role-play, skill-building exercises and reviews of audio-recorded practice samples.

Appendix K Study 2: Selection of method to assess motivational interviewing skill

K.1 Collection of samples of practice for analysis

Several strategies have been used for collecting samples of clinicians' practice to derive measurements of MI skill. These include live observation of practice, submission of audio or video-recorded samples of actual practice and simulated consultations using actors. Each of these has benefits and limitations. Within this section is a justification for the use of audio-recorded practice samples for study 2 (learning MI).

Live observation of practice

Live observation of practice involves watching and coding consultations during a patient appointment. The approach pre-empts clinicians selecting patients with specific characteristics or submitting recordings that reflect only their best MI performance. Another benefit is that performance feedback can be given immediately after the session when it may be most effective (Smith et al. 2012b). The presence of a researcher can influence patient and clinician behaviour though. It can also be an inefficient way of collecting data since the researcher may have to wait long periods before an appropriate patient session occurs (because of non-attendance or a refusal to allow the session to be observed). The author discounted this method, since a lack of flexibility in his schedule as a part-time PhD student would have prevented attending appointments as they occurred.

Practice samples and simulated consultations using standardised patients

Practice samples refer to consultations with actual patients, whereas simulated consultations involve actors or other professionals who are trained to role-play a standardised patient. Both forms are recorded to allow for analysis. Audio-recording devices are cheaper than those used for video-recording and tend to be less intrusive. Patients are also less identifiable from voice alone, which helps with data protection. Moreover, whilst non-verbal behaviour can be observed in video recordings, most instruments used to assess MI skill do not code this, making the additional information surplus to requirements. It was for these reasons that the author elected to use audio-recordings of practice.

The relative merits of practice samples and standardised patients are summarised in Table K-1. The overriding requirement for the present study was for an ecologically valid method whereby participant skills and patient responses most closely mimic everyday practice. The use of practice samples was deemed superior in this regard. It is questionable whether standardised patients are able to respond authentically to clinician participants; they have been known to respond invariably to different levels of MI skill (Miller et al. 2004) and there is a paucity of evidence showing that skills assessed with standardised patients generalise to actual practice.

For example Decker et al. (2013) found poor correspondence between MI sessions involving real patients and those with standardised patients, with superior MI skill being demonstrated in the latter. In clinical practice, patient characteristics vary considerably and this in turn can influence clinicians' use of MI (Francis et al. 2005; Imel et al. 2011; Imel et al. 2014). In a multisite trial involving substance abuse counsellors, Imel et al. (2011) found a high variability in the use of MI within each clinician's caseload; higher levels of patient motivation at the beginning of each MI session predicted clinicians' adherence to MI and their competence in delivery.

A related benefit of practice samples is that they contain information that is relevant to the intervention development element of the complex intervention framework. For example, understanding the range of motivational issues that patients with Chronic Obstructive Pulmonary Disease (COPD) raise when discussing physical activity could help to refine the content and focus of the proposed MI intervention and associated training activities for clinicians.

Practice samples have several limitations. Firstly, when participants are asked to provide recordings of their practice, they can choose which patient and session to record. Therefore, submitted recordings may reflect their best MI-performance rather than normal practice. Whilst the use of standardised patients pre-empts this issue, it still measures the ability to produce MI-skills on demand. Secondly, relying on participants to submit practice samples is relatively inefficient, since delays or non-submission can occur because patients fail to attend planned appointments or do not consent to having their consultation recorded (Baer et al. 2004; Miller et al. 2004; Moyers et al. 2008). This does not occur when standardised patients are involved since appointments are pre-arranged with actors who are paid. Although securing clinician recordings of their actual practice can be resource intensive and time consuming, the author believed that this would be worthwhile considering the issues relating to ecological validity that have been described.

Table K-1 *Comparison of Two Methods to Gather Samples to Derive Measures of Motivational Interviewing Skill*

	Standardised Patient	Practice Sample
Clinician Performance		
Skills generalise to actual practice	Questionable	High
Skills representative of routine practice as opposed to best practice	High	Low
Patient		
Variability in patient characteristics	Low	High
Patient response co-varies with clinician skill	Low	High
Suitability of coding of patient behaviour (MISC)	Low	High
Potential for qualitative analysis of patient response	Low	High
Practical Issues - Submission rates influenced by:		
Patient availability	Low	High
Patient issues (not appropriate to record)	Low	High
Forgetting to record	Low	High
Patient not consenting to record	Low	High
Practical Issues – Other		
Expense	High	Low
Requirement for training of patient	High	N/A
Ease of collection of practice samples	High	Low

K.2 Assessment of motivational interviewing skill

Several instruments have been developed to evaluate the integrity of MI delivery. Systematic reviews of the psychometric properties of MI integrity measures reveal that whilst the available instruments show promise, most require additional psychometric evaluation prior to widespread use (Madson and Campbell 2006; Wallace and Turner 2009; Gill et al. 2020).

Of the available instruments, the Motivational Interviewing Skill Code (MISC) (Miller et al. 2008) and the Motivational Interviewing Treatment Integrity coding instrument (MITI) (Moyers et al. 2005b) were considered for use in study 2. These two have been most widely evaluated and have adequate reliability and validity data. Both have thresholds indicating competence in the use of MI. The main features of the MITI and MISC are shown in Table K-2.

Table K-2. *Comparison of the Motivational Interviewing Skill Code (MISC 2.1) and Motivational Interviewing Treatment Integrity Coding system (MITI 3.1.1)*

	MISC 2.1	MITI 3.1.1
Focus	Clinician and patient behaviour	Clinician behaviour only
Use	Measurement of training effects Feedback/coaching Integrity monitoring Process evaluation	Measurement of training effects Feedback/coaching? Integrity monitoring
Relative complexity	High	Low
Resultant behaviour codes	18-clinician, 7-patient	10-clinician
Coding passes (n)	3	1
Time to code each consultation	90 to 120-minutes	30-minutes
Reliability of Coding	Challenging	Adequate

The MISC is the more complicated of the two systems (Wallace and Turner 2009; Moyers et al. 2016b) with analysis focusing on both clinician and client speech. The MITI was developed by Moyers et al. (2005a) to meet the need for a more efficient system to evaluate treatment integrity in MI research and focuses exclusively on clinician behaviour.

There were three main reasons for selecting the MITI for the present study. Firstly, the relative complexity of the MISC means that coder training takes longer than it does for the MITI, and it also takes longer to code patient sessions. Reliability estimates for the MITI tend to be higher, most likely because the many of the components that require differentiation in the MISC are considered as a single entity in the MITI (Moyers et al. 2005a). Secondly, although knowing the relationship between clinician and patient variables is helpful when testing potential mechanisms of action of MI, it provides a level of information that was beyond the requirements of the present study. Finally, the MITI is the most commonly used treatment integrity measure in clinical trials of MI (Miller and Rollnick 2014; Moyers et al. 2016b).

K.3 Psychometric properties of the MITI code

Research evaluating the psychometric properties of the Motivational Interviewing Treatment Integrity (MITI) code is summarised in Table K.3.

Table K-3 *Psychometric Properties of the Motivational Interviewing Treatment Integrity (MITI) Coding Instrument*

	Moyers et al. (2005a)	Pierson et al. (2007)	Forsberg et al. (2007)	Seng and Lovejoy (2013)	Spohr et al. (2016)
MITI version	1.0	1.0	1.0	3.1.1	3.1.1
Setting	Substance use	Substance use	Addiction (drug use, smoking, gambling)	Sexual risk behaviours in HIV/AIDS	Substance use in community corrections
Reliability Interrater	Three experienced raters independently coded randomly selected 20-minute segments of 50 practice samples. ICCs were: empathy 0.52 (95% CI: .35, .67); MI spirit 0.58 (95% CI: .43, .72); MI-adherent 0.81 (95% CI: .72, .88); MI-non adherent 0.75 (95% CI: .64, .84); closed questions 0.97 (95% CI: .95, .98); open questions 0.94 (95% CI: .90, .96); simple reflections 0.81 (95% CI: .72, .88); complex reflections 0.58 (95% CI: .42, .71).	Four groups each with 1 graduate and 2 undergraduate students coded 41-60 simulated consultations (10-20 minutes). Mean ICCs across groups were: empathy 0.72; MI spirit 0.71; MI-adherent 0.75; MI-non adherent 0.84; closed questions 0.98; open questions 0.92; simple reflections 0.82; complex reflections 0.88 (95% CIs: not reported).	Five highly trained raters coded first 20 minutes of 15 practice samples. Mean ICCs across raters were: empathy 0.42; MI spirit 0.48; MI-adherent 0.55; MI-non adherent 0.43; closed questions 0.79; open questions 0.77; simple reflections 0.65; complex reflections 0.57 (95% CIs: not reported).	Two raters independently coded randomly selected 20- minute segment of 12 practice samples. ICCs were: for 5 global ratings combined 0.20 (95% CI: -.06, .43); MI-measures (giving information, MI-adherent and MI-non adherent 0.77 (95% CI: .59, .87); questions (open and closed) 0.90 (95% CI: .77, .95); reflections (simple and complex) 0.81 (95% CI: .60, .91).	Four raters independently coded all 30–50 minutes of 8 practice samples. Mean ICCs across raters were: empathy 0.67; autonomy support 0.69; collaboration 0.51; evocation 0.41; MI-adherent 0.69; MI-non adherent 0.46; closed questions 0.79; open questions 0.95; simple reflections 0.86; complex reflections 0.74 (95% CIs: not reported).

	Moyers et al. (2005a)	Pierson et al. (2007)	Forsberg et al. (2007)	Seng and Lovejoy (2013)	Spohr et al. (2016)
Validity					
Factor structure				Principle component analysis showed 1-factor model of MITI summary measures accounted for 34.36% of the variance in data. Two-factor solution (MI style and MI techniques) accounted for 56.08% of the variance in MITI scores.	
Criterion predictive				Negative binomial regression used to examine relationship between factor scores from principle component analysis and primary outcome from clinical trial. Components of 2-factor solution were significantly related to outcome. Adjusted odds-ratio = 0.36 (95% CI: 0.21, 0.61) for MI style and 0.41 (95% CI: 0.26, 0.65) for MI techniques.	Logistic regression models showed MI spirit ratings (mean of evocation, collaboration and autonomy support) across 2 treatment sessions predicted 2-month treatment initiation χ^2 (1) = 4.1, $p < .05$, $R^2 = .05$. For every one-unit increase in MI spirit rating, the likelihood of treatment initiation increased by a factor of 2.82.
Construct convergent	MITI scores accounted for 59% of the variance in MISC EFA factor scores				

	Moyers et al. (2005a)	Pierson et al. (2007)	Forsberg et al. (2007)	Seng and Lovejoy (2013)	Spohr et al. (2016)
Responsiveness to change	Comparison of pre and post training MITI scores (n=20) using paired sample t-tests. Improvements in expected direction on empathy, $t(18) = 5.99$, $p < .001$; MI spirit, $t(19)$ 4.94, $p < .001$; complex reflections, $t(18) = 3.73$, $p < .001$; total reflections $t(19) = 2.60$, $p < .018$; reflection to question ratio $t(19) = 3.01$, $p < .01$; and percent of complex reflections $t(19) = 2.35$, $p < .03$.				

Note. CI = confidence interval; EFA = exploratory factor analysis; MISC = Motivational Interviewing Skill Code.
Psychometric properties are reported for both the original version of the MITI (1.0) and version 3.1.1 used in study 2.

Appendix L Study 2: Motivational interviewing intervention manual (PREAMP)

PRomoting
Exercise
Adherence using
Motivational interviewing blended with
Pulmonary rehabilitation
(PREAMP)™

Integration Manual

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Study Title: Training Health Professionals to use motivational interviewing to encourage exercise adherence as part of pulmonary rehabilitation
REC reference: 11/SW/0358

This manual has been written to support the face-to-face training element of the research study that you are involved in. It does not contain an exhaustive description of motivational interviewing (MI) but provides guidance as to how MI might be integrated within consultations as part of pulmonary rehabilitation (PR). This is achieved through the description of a series of MI-based strategies that may be used during the first 'engagement' session delivered prior to PR and a 'support consultation' used to strengthen commitment during the programme.

The format and description of the consultations, together with the suggested dialogue, has drawn heavily from the work of Dr Allan Zuckoff and colleagues from University of Pittsburgh who have described and tested the use of MI as an adjunct to psychological treatments in other contexts[1]. It has also drawn on explanations and suggested dialogue from the 'Motivational interviewing in healthcare' text written by MI's founding fathers[2].

The 'road-map' of strategies has been adapted using input from clinicians involved in PR and is set out to show what a helpful discussion involving MI may look like. The intention is for you to use the strategies flexibly to meet your patient's needs. Omit any strategy that does not seem relevant or appropriate for a particular patient and reorder them where necessary to enable you to follow the patient's narrative - don't be a slave to the roadmap!

Although the manual focuses on technical matters (strategy, ways to structure the conversation etc.), your style of working is paramount. This involves evoking the patient's ideas about change (rather than imposing your own) and trusting their ability to make healthy decisions. It also involves asking open-ended questions and responding with reflective listening to communicate acceptance and understanding of the patient as they are. This creates the conditions of support that encourages people to consider the possibility of change and helps them become more motivated.

Feedback and suggestions for improvement are encouraged!

[1] Adapted with permission from "Motivational interviewing as a prelude to psychotherapy for depressed women" by Zuckoff A, Swartz HA and Grote NK (2015) IN: Arkowitz H, Miller WR and Rollnick S (eds) *Motivational Interviewing in the treatment of psychological disorders* (2nd Edition). New York: Guilford Press 136-169 and "Enhancing the effectiveness of exposure and response prevention in the treatment of obsessive-compulsive disorder: Exploring a role for motivational interviewing" by Zuckoff A, Balán IC and Simpson HB (2015a) IN: Arkowitz H, Miller WR and Rollnick S (eds) *Motivational Interviewing in the treatment of psychological disorders* (2nd Edition). New York: Guilford Press 58-82.

[2] Rollnick S, Miller WR and Butler CC (2008) Motivational Interviewing in Health Care: Helping Patients Change Behaviour. New York: Guilford Press

Engagement Consultation

The engagement consultation follows the referral for PR and can be delivered either as a stand-alone session or integrated as part of the usual intake appointment. It involves the sequence of strategies listed in the column to the right.

The aim is:

- To help the patient to clarify their treatment needs and goals and to facilitate their full engagement with PR.

More specifically, the objectives are:

- For the patient to feel listened to and understood;
- For you to communicate your understanding of the patient's perspective regarding their health situation;
- Help the patient to see how the potential benefits of PR coincide with their values, goals and current health concerns;
- To facilitate exploration and resolution of ambivalence about change; and
- Problem-solve practical and psychological barriers to engagement.

Strategy 1: Set the scene and agree an agenda

Strategy 2: Elicit the patient's story

Strategy 3: Raise the subject of physical activity and provide feedback

Strategy 4: Build motivation and confidence for increasing physical activity

Strategy 5: Explore hopes and fears for PR

Strategy 6: Elicit commitment (or leave the door open)

Strategy 7: Problem solve practical and psychological barriers to engagement

Set the scene and agree an agenda

The aims:

- Begin to develop a rapport.
- To give the patient a sense of control in the course of the consultation.

The strategy:

- Introduce yourself.
- Confirm the patient's name and personal details.
- Outline the purpose and duration of appointment.
- Emphasise patient choice and control.

Sample dialogue:

- Welcome, my name is […] and I'm one of the nurses/physiotherapists/therapy assistants here. Can I just check your details? ….
- I understand that you have been referred by [. . .] to talk about the programme that we offer here called pulmonary rehabilitation - is that your understanding? What do you already know about the programme?
- Before we get going, would it be okay if we talked about how we might work together and what we might do today?
- We have an hour for today's appointment, which is about us working together to explore how you feel about attending pulmonary rehabilitation as a way of helping with your breathing.
- I will need to ask you some questions about your medical history; there are some questionnaires to complete and routine measurements to take.
- If it's okay with you though, I'd like to leave those for now. My first priority is to listen to you to understand how your breathing condition is affecting you, and also how you feel about coming to pulmonary rehabilitation. We can complete those other things towards the end of the consultation if you decide to join the programme.
- What I am certainly not going to do is to lecture you or try to force you into coming to pulmonary rehabilitation. That decision really is one for you to make.
- How does that sound?
- What are the things that you want to make sure that we talk about today?

Elicit the patient's story

The aims:

- Ensure the patient feels listened to, understood and accepted without judgment.
- Initially: Help them to talk about their current physical activity and any activity-avoidance without it being labelled as a problem.
- Subsequently: Explore the patient's perspective of their health situation, elicit talk about the importance of a change in their state and identify perceptions/reasons for their referral.

Commentary:

What seems fundamental to an effective behaviour change consultation is that the patient experiences the relationship with you as safe and trustworthy. When they feel this way, they will be more willing to talk openly about their situation and the prospect of PR without feeling the need to be guarded. The implicit questions that they will ask are:

1) Do I feel listened to, understood and accepted as I am, without my clinician judging me negatively or criticising what I am doing?

2) Do I feel a sense of control – free to make my own decisions rather than being pressurised into making a change that I am not ready for or sure about?

For this reason, the early strategies of the engagement session are focused on developing your relationship with the patient. The emphasis is on listening and understanding rather than assessing and giving advice.

The strategy:

1. Explore 'a typical day'

- Set the scene and locate the day.
  Using the previous day tends to improve recall. You can refer back to this if the patient digresses.
- Invite patient to talk you through their day.
  Listen to their narrative and respond with non-judgmental reflective listening statements.
- If necessary, adjust the pace:

To increase it: summarise what you've heard (the portion of the day where they might be giving excessive detail) then ask the patient what they did afterwards.

To slow it down: ask for more detail.

- Resist the temptation to ask questions that suggest you are assessing the amount of activity that they are doing (e.g. how fast is the walk, how far?)
- Summarise where physical activity fits in and how their breathing influences them. Avoid terms that suggest you have judged how much they do (so you're inactive/sedentary). Include instances of activity avoidance due to breathing difficulties/anxiety in your summary.

2. Enquire about how activity and symptoms have changed over time

- Ask about how the patient's activity and symptoms have changed since their diagnosis and if they have noticed any patterns.
- Summarise the patient's story, capturing any concerns about their limitations and highlighting any wishes for help in improving their condition.
- Focus on understanding the patient's perspective and building the relationship.

3. Identify reason(s) for referral

- Ask what prompted their GP or consultant to refer them for PR.
- Avoid addressing the patient as if they are ready to change (they have yet to make that decision).

Sample dialogue:

Typical day

- Set scene: Could you talk me through a day that is fairly typical in your life, so I can understand how your breathing affects you and where physical activity currently fits in?
- Locate day: Can you name a day that is fairly typical, how about yesterday?
- Invite: Take me from the moment you get up, to the time you go to bed and tell me how your breathing affects you and where physical activity fits in (explore feelings as well as behaviour). When you headed out for the walk, how were you feeling?
- To increase pace: During the morning, you stayed at home and watched television. What about the afternoon?
  To slow the pace: Can I take you back and ask how you felt when you woke up?
  If the patient drifts off task: And what about yesterday in particular? or Can I come back to that a bit later on?
- Summarise: It took a while for you to get going in the morning, but once your medication took effect, you started your chores. You walked to get a paper but had to stop regularly because you became breathless. You said yesterday was a good day overall in that your breathing didn't stop you from getting out in the garden, which is something you enjoy…etc.

Explore pattern of activity and symptoms since diagnosis

- Ask about pattern since diagnosis: What have you noticed about your activity patterns and your breathing over the years since you were diagnosed? (listen reflectively).

Identify reason for referral

- Ask: What did your doctor tell you about why he/she referred you to the programme?
- Summarise the patient's story: You've noticed over the last year that your chest is getting worse and you have decreased your physical activity because you get tired very quickly and are concerned about getting out of breath. There are some things that you like to do, such as gardening, that you are not always able to because of your breathing, and that means you sometimes miss out on family fun. You get frustrated sometimes because you sense you are holding others back when you go out for walks together and you'd like to be able to do more with your grandchildren. Your GP was concerned with how long it has been taking you to recover from chest infections and thought that coming here to experiment with some exercise might be a good idea.

Raise the subject of physical activity & provide feedback

The aims:

- Offer the patient a different perspective on their current difficulties.
- Sensitively reframe the patient's day-to-day difficulties and declining function as a recognisable and understandable problem, which can be addressed by PR.

Commentary:

This strategy involves offering basic information regarding the negative spiral of inactivity, deconditioning and breathlessness. The goal is to help the patient to see the relationship between their current coping strategy for managing breathlessness (activity avoidance) and the problems they are experiencing. It is also important to discuss how increasing physical activity and exercise is beneficial for patients with COPD. Avoid implying that they 'must' attend PR and 'should' increase their activity though.

Ambivalence may surface at this point. This is quite normal and indeed helpful to the change process and can be worked through during the next strategies. At this point just listen and acknowledge it.

The strategy:

Exchanging neutral information involves 3-stages:

1) Ask how much the patient knows already.
   Seek their permission before providing information (or give permission to disregard what you say). Be respectful of their views and acknowledge that they will be the best judge of what it means for them and whether to act on it.

2) Provide information 'neutrally'. Refer to science and/or other's experiences, rather than using 'you' language. Tailor to their concerns and current knowledge.

3) Ask the patient to interpret the personal meaning.

- Use reflective listening to convey understanding and acceptance of the patient's views and behaviour.
- Avoid acting on any temptation to coerce or convince them about the need for change. Emphasising the patient's need and right to choose is helpful as it encourages them to surface any concerns about change that need to be worked through and results in deeper levels of exploration of their ambivalence.

- If the patient rejects the information you provide, for example by attributing increased breathlessness and fatigue to a natural worsening of their underlying condition, reflect this non-judgmentally. At the same time, look for opportunities to connect the troubles the patient describes to the beneficial effects of PR.

Sample dialogue:

Breathlessness–activity avoidance–deconditioning

- Stage 1 Elicit permission: Would it be okay if we talked about physical activity and COPD?
  How much do you already know about this?
  Let me know if there is anything that doesn't sound right to you.
- Stage 2 Provide neutral information: We know that people with COPD tend to get breathless quicker and tire more easily than those without. It is also normal for them to fear being breathless. A natural and understandable way to cope is to avoid physical activity. This is certainly helpful in the short-term because it means avoiding the uncomfortable feelings and having to face the fear of breathlessness. In the long-term though, reducing activity leads to reduced fitness and it takes less activity to become tired and breathless.
- Stage 3 Ask for personal interpretation: How does that fit in with what you have said?

  Note: Sometimes, the patient will respond without an invitation or will convey how they feel about it non-verbally. In these circumstances reflect the patient's reaction.

  I can see how this is confusing. A very understandable thing to do when you get breathless is to stop what you are doing to get your breath back, and you tend to avoid exercise because you find it unpleasant and it makes you feel out of control. And here I am saying that being breathless is good for you and that patients with COPD should exercise in order to become breathless. This isn't really what you wanted or expected to hear.

Physical activity and exercise as part of PR

- Stage 1 Elicit permission: How much do you know/would you like to know about the role of exercise in managing the symptoms of COPD?
- Stage 2 Provide neutral information: One thing that is helpful for reducing breathlessness and fatigue and can give people with COPD a better sense of control over their condition is exercise. This is a key part of pulmonary rehabilitation, the programme you have been referred for. With guidance and careful monitoring from professionals like me, we encourage patients to exercise to a level that makes them breathless. We know that this is challenging for people who easily become breathless and tired, but we find that over time, this leads to improvements in the amount of activity that they are able to do.
- Stage 3 Ask for personal interpretation: How do you feel about engaging in a level of exercise and activity that makes you breathless?

Build motivation for physical activity including exercise

The aim:

- This strategy encourages patients to explore and resolve ambivalence about physical activity including exercise.

Commentary:

MI views unresolved ambivalence as a key reason why patients do not fully engage with treatment and fail to adhere to recommended lifestyle changes. The goal of this element of the consultation is to explore and attempt to resolve the immobilising ambivalence, thereby building motivation for change.

The strategy involves eliciting and reinforcing the patient's own arguments for change. The more people think about and verbalise how important exercise is to them and how their low activity levels influence their ability to live the life they want, the more motivated to change that they will become. Whilst many patients who you see already perceive a discrepancy between their current level of fitness and where they'd like to be - they are also ambivalent about exercise. Their ambivalence commonly stems from simultaneously wanting to gain the benefits of exercise and also wanting to avoid the discomfort associated with it. The aim is to guide the conversation in a way that differentially reinforces the change side of the argument so that they become more committed to it.

What seems to be necessary here is that the patient genuinely considers the personal factors influencing change, rather than being the passive recipient of professional advice. This can be difficult to facilitate since patients tend to behave in a way that they think is expected of them. Many are reluctant to surface the negative side of their ambivalence for fear of judgement, and instead give agreement to change when it is suggested (even though they are not personally invested in making a change). This results in weak commitment and potentially poor engagement with PR.

Remember the gauges of psychological safety described on page 5. Patients need to feel listened to, accepted as they are and not feel as if they are being controlled. When these conditions are present, patients will be more willing to think about and share how they really feel about change. Once the negative side of their ambivalence surfaces, it is possible to support the patient to work through it.

The strategy (1): Explore motivation and confidence for increasing physical activity including exercise

- Ask for numbers on a 0-10 scale that represent how motivated and how confident the patient is to exercise regularly as part of PR.
- Once you have a number for each scale, go back to the motivation scale and ask why this number and not a lower one? (though not if they said '0'). The response will be change talk. Keep the pace slow, listen carefully and be curious about how the patient really feels - paying attention to the emotional depth of the change talk. Use open-ended questions, affirmations and reflective listening to encourage elaboration and to strengthen it.
- If you hear sustain talk (arguments against change) listen and don't provide counterarguments. Often, responding with a reflection that captures what has been said and acknowledges their views as legitimate, is enough to allow you to refocus on change.
- Repeat this sequence with the confidence scale once all aspects relating to motivation have been explored. You might also ask the patient whether there is anything you can do to increase their confidence in their ability to exercise regularly. Often patients say that starting off at a low level, building up slowly, meeting other people like them who have been successful would help.

Sample dialogue:

- Step 1 Ask for number on motivation scale: On a scale from 0-10, how motivated are you right now to exercise on a regular basis as part of pulmonary rehabilitation - 0 on the scale is not motivated at all and 10 is very motivated?
- Step 2 Ask for number on confidence scale: And if you decided to start the programme, how confident are you right now, that you'll be able to exercise regularly at a level that makes you breathless, where 0 is not confident at all and 10 is very confident.
- Step 3 Elicit and reinforce change talk about motivation: You said 5 on the motivation scale. Why that high?
- Step 4 Elicit and reinforce change talk about confidence: You said 4 on the confidence scale. Why did you say 4, and not a lower number? What could we do that would increase your confidence?
- To reinforce and strengthen change talk:
  Ask for examples or reasons: Can you give me a specific example? or describe the last time this occurred
  Query extremes: What is the best reason for doing it?
  Ask for more: What other reasons?
  Affirm change talk: That sounds like a good idea
  Reflect it by restating it back to the patient: Getting fitter really is about taking control back. It's something you can do for yourself.

The strategy (2):
Explore two possible futures

- This strategy is similar to the previous one in that its aim is to evoke and reinforce the patient's own arguments for change. It invites them to consider the perceived benefits associated with sustained changes in physical activity/exercise as well as the negative, long-term consequences that might result if they elected not to change. Responses to both scenarios will be change talk.
- Listen carefully to what they say and use open-ended questions and reflective listening statements as per the previous strategy to encourage elaboration and strengthen the change talk.
- What to look out for: Make sure that the strategy doesn't have a warning quality about it. Explore ideas and concerns sensitively and avoid imposing your own views. Avoid asking about concerns regarding the no change scenario if their confidence about changing physical activity and exercise is low.

Sample dialogue:

- Ask about a future having changed: Let's imagine for a moment that you decide that it *is* time for you to join the programme, and we meet up in two years' time. If, during that time you had managed to exercise regularly during the programme and had found a way to integrate more physical activity into your life after the programme had ended, what would life be like for you then?

  What would be the best outcome that you could imagine?

- Ask about a future having not changed: Now imagine that you decide that now is *not* the right time for you to change your levels of exercise and overall physical activity, and we meet up in two years. What would things be like for you?

  What would have changed?
  What about that concerns you the most?

Explore hopes and fears for PR

The aims:

- Explore the patient's perceptions of PR (rather than physical activity in general) including factors that may influence their engagement with the programme.

- Help the patient to see how PR may provide what they are hoping for.

The strategy:

- Explore the patient's perceptions (positive and negative) of PR (based on personal experience or from what other patients or health professionals have said).
- Listen carefully, use reflective listening statements to communicate non-judgmental understanding.
- Emphasise personal choice and control when the patient expresses negative beliefs, particularly if these are undermining their motivation to join your programme.
- Explore the patient's hopes and fears about PR. What would they want and what would they want to avoid?
- Share information where relevant using the 3-stages previously described (elicit permission, share neutral information, elicit patient's personal interpretation).
- Look for opportunities to help the patient to see that your programme can help them achieve what they are hoping for. This may involve you describing its philosophy (individualised exercise, supportive staff, careful monitoring, involvement of other patients like them) and noting similarities between the approach taken and their own needs. Be sensitive to the patient's reaction.
- Don't let this to turn into a sales pitch. Avoid language that suggests you have made the decision about joining for them (e.g. *when* you come, what do you hope will happen?)

Sample dialogue:

- It sounds like you have heard about what we do in pulmonary rehabilitation. Can you tell me a little more about that?
- Looking forward, what concerns do you have about joining the programme here?
- If you joined, what could we do to help you to get though?
- If you decided to join the programme and everything turned out as well as you hoped, what would be different by the end?

Elicit commitment (or leave the door open)

The aim:

- Elicit and/or consolidate commitment to join PR.

Commentary:

Signs of readiness: Good signs that a patient is ready to join the programme are when sustain talk diminishes, the patient starts envisioning a future involving more exercise – perhaps asking questions about it, and/or they start talking about what they could do to change. Of course, their response to a direct question about their intentions will also let you know.

If the patient expresses a commitment to joining the programme you can proceed to arranging the specific details; which programme, start date, what needs to be done to make it happen (telling others, travel arrangements etc.).

In instances where the patient remains ambivalent, then reflect both sides non-judgmentally and convey a willingness to discuss the issue again (for example, following discussions with significant others or in the future should their situation change).

Sample dialogue:

Often a summary followed by a key question about joining the programme will start the process:

- Summarise the patient's story [the most developed elements of change talk, hopes and fears for PR] then ask:

  How does this sound to you?
  What do you think you'll do?
  Is this what you want to do?

- When ready - arrange specific programme details:

  We have programmes that run on [. . .], which is best for you?
  What will you have to do to make yourself available?

- If not ready - convey acceptance and willingness to discuss again:

  Thank you for taking the time to speak with me today and for sharing your thoughts about your breathing and about the programme we offer here. It sounds like it is something you are interested in, but you have other priorities at the moment, and you said you would want to be in a position to commit fully if or when you start. I think that is a very sensible idea, and it has to be your decision. What thoughts do you have about arranging a time to speak again in [appropriate time frame]?

  I'd be very happy to talk with you again in the future if you think that would be helpful.

Problem-solve practical and psychological barriers to engagement

The aim:

- Help the patient who is ready to join the programme to problem solve barriers that might undermine engagement.

Commentary:

Most commonly, when patients are asked about barriers to engagement, they describe practical issues first (such as transport) since they may be perceived to be more socially acceptable and not too revealing.

If there are other underlying concerns, then these are typically shared after any practical issues are addressed. Psychological barriers include worries about not fitting in, being too ill or frail, inadequate social support, not being the exercising type and lacking in confidence about maintaining appropriate levels of physical activity.

Psychological barriers are addressed in much the same way as practical ones. Remember the more involved the patient is in identifying a solution, the more committed they will become. Listen carefully to what they say and remain open to their concerns. Acknowledge them with reflective listening statements and encourage the patient to think about the support they envisage would be helpful to address the issues they present.

Reassuring the patient that their concerns are understandable, particularly for a person with COPD who is new to exercise, can be helpful. Be aware also, that your well-designed programme involving individualised exercise, support/reassurance, linkage with other patients with COPD etc. will pre-empt many of the issues.

Occasionally patients do not share any obstacles to engagement. This may mean that they do not perceive any, but to encourage the patient to reveal barriers that they are reluctant to offer, it can be helpful to suggest some that other patients have raised. "Other patients have told me that even though they want to try out pulmonary rehabilitation, they might find it hard to summons the energy or will power to exercise when they are tired and are worried about becoming breathless. In fact, most people have at least some doubts – how about you?"

The strategy:

- Ask about barriers to engagement. Reflect what the patient tells you, and then try to engage them in identifying a workable solution.
- Be careful not to jump in with simple solutions to these barriers. If you do, what normally happens is that the patient will respond by telling you how your solution won't work.
- If the patient says I don't know, you tell me, you're the expert (perhaps avoiding taking responsibility) acknowledge the extent of your expertise and try to keep them engaged in the thinking process – challenging as it may be for them.
- End on a positive note, summarising their commitment, affirming their participation and conveying optimism about the beneficial effects of their involvement.

Sample dialogue:

- Ask about barriers and potential solutions:

  When you imagine yourself coming here again for an exercise session, what kind of thoughts go through your mind?

  What might make it hard for you to follow through with this programme and exercise at the level that we've been discussing?

  If that did happen what do you think you might be able to do? How could you overcome that should it occur?

- If the patient says, "I don't know you tell me – you're the expert" you could say:

  Well I can certainly tell you about what has worked for other patients, but I don't want to imply that because I have said it that that is what you should do – you will be the best judge as to what will work; or

  I generally find that people have good intuition about themselves and what will work best. I am happy to share my thoughts, but I am really interested in hearing yours as well – perhaps we can work on a plan together?

- Summarise key elements of the overall plan

  You've decided to start the programme beginning on [date] which runs [details]. In order to attend you said you will need to [tell others, rearrange other things]. The main reasons for doing this are [most developed elements of change talk]. The things you are prepared to put up with in order to increase your activity levels are […], some of the things which might get in the way of your plan include […] and you said you will cope with these if they did occur by […], other people will be able to help by […].

- Convey hope and optimism about participation:

  I am glad that you came in today and I appreciate how open and honest you have been with me about joining the programme. I firmly believe that you will find it helpful and get the things that you are hoping for.

Support Consultation

This appointment may occur at any time during/after PR to consolidate motivation and commitment. Alternatively, it can be used to address sub-optimal adherence in instances where:

- attendance has declined;
- the patient has been reluctant to engage with the exercise component of PR at the appropriate level;
- they struggle to complete appropriate levels of physical activity between PR sessions;
- the patient is reticent about continuing with the programme.

The overall objectives of this appointment are to:

- Consolidate/develop previously established rapport;
- Identify key motives for continuing/increasing engagement with PR (attendance, exercise/physical activity);
- Explore and acknowledge any difficulties that the patient has been experiencing;
- Problem solve barriers that have been experienced/are anticipated in the future;
- Consolidate/build commitment.

The strategies summarised below can be used as the basis for the consultation, but the order and exact content will need to be tailored to reflect the patient's circumstances and need.

Strategy 1: Elicit the patient's story

Strategy 2: Explore motivation and confidence

Strategy 3: Problem solve practical and psychological barriers to ongoing engagement

Strategy 4: Summarise discussion

Elicit the patients' story

The aims:

- Ensure the patient feels listened to and understood.
- Elicit the patient's perspective of their progression and any difficulties they may be experiencing.
- Help the patient to talk about their current physical activity in non- pathological framework.

Commentary:

The specific approach taken will very much depend on the context. For example, a conversation prompted by a patient who expresses dissatisfaction with the progress they have made will likely begin in a different way to one instigated by you after noticing a patient's attendance has declined. Whatever the situation, keep in mind the overall objective at this stage, which is to understand and not judge.

The strategy:

- In instances where you are unsure, enquire about how the patient's physical activity has changed since the engagement consultation.

Or

- If you have concerns about the patient's level of engagement, give feedback using the 3-stages of neutral information exchange and enquire about difficulties they have encountered. To pre-empt defensive reactions, be sure to remain empathic and non-judgmental and indicate your wish is to understand the challenges that they are having.
- Listen carefully and look for opportunities to affirm the patient's efforts and successes (even if overall their engagement has been sub-optimal).
- Acknowledge any difficulties and barriers that they describe with reflective listening that conveys acceptance of their experience and views. Avoid persuasion and confrontation (you can help the patient to problem solve the difficulties later, once you know that they are motivated to do so). Reframing problems as opportunities to learn more about themselves and to problem solve can be helpful.
- Agree focus for the next phase (increase attendance/exercise intensity, consolidate progress).

Sample dialogue:

- Ask:

  Perhaps a good way to get started today would be if you could describe how your physical activity has changed since you started the programme.

- Or exchange neutral information:

  1) Would it be okay if we talked about how the programme is going for you? ….

  2) I notice that you've experienced some difficulties during the last few weeks which have prevented you from making as much progress as you had initially hoped.

  3) Reflect their reaction or ask – It sounds like it's been a challenging time for you - help me to understand what has been happening.

- In instances where the patient's dissatisfaction/declining engagement is because they've not been experiencing the benefits they were expecting:

  1) Listen to and acknowledge the patient's experience of PR without trying to change their perception

  You haven't experienced the benefits of exercise that you were hoping for; or Things haven't changed in the way you were expecting
  2) Look for opportunities to reinforce the patient's efforts:
  Despite not experiencing any benefits so far, you've been determined to do the best you can and have turned up every week. (Note the words 'so far' introduces the idea that continued effort may lead to changes in the longer term).

  3) Sometimes patients don't recognize that functional improvements (more reps, greater resistance, greater walking distance without rest etc.) provide evidence that they are making progress toward their goals. Use neutral information exchange to provide information.

  (Permission to disregard) I'd be interested to hear your views on this - I don't want to deny you your experience of not getting what you'd hoped for just yet, (share information) but what I have noticed is that since you have been coming you have been able to walk further before stopping. And although you are as breathless when you're exercising as you were at the start, it takes more exercise to get you to that point. (ask) What do you make of that? (ask)

  4) Reinforce change talk regarding any benefits they have experienced and evoke elaboration.

- Summarise the issue.

- Agree a focus for the next phase of the conversation
  Where do we need to take the conversation from here?
  Would it be helpful to look at your options? One option would be to talk about possible ways to overcome the concerns you have about becoming breathless, another would be to [. . .] can you think of any other options? What makes most sense to you?

Explore motivation and confidence

The aim:

- To build motivation and confidence for increasing/ maintaining appropriate attendance, levels of exercise and daily physical activity.

Commentary:

You will already have an understanding of their readiness based on their responses during the previous strategy. At this point in rehabilitation, the patient may draw on actual improvements they have experienced from the programme so far in addition to anticipated benefits from continuing/increasing what they do.

You can also use this strategy in circumstances where the focus is consolidating their motivation to keep going (rather than increasing what they do). You would need to modify the language accordingly though.

The strategy:

The approach used to explore and build motivation within the engagement consultation may be used, though other suggestions are provided here.

1. Elicit and look to develop change talk.
2. Listen for sustain talk and respond in a way that acknowledges and accepts it as legitimate. Avoid giving advice or presenting counterarguments as this will likely prolong and reinforce the sustain talk.
3. Summarise and enquire about next steps.

Sample dialogue:

- Enquire about motivation:
  If you did find a way to get around those difficulties and were able to attend more sessions, what would be good about that?
  If you did decide to increase the level of exercise, what do you think would happen?

  Ask for elaboration: In what way..? Tell me more about [. . .] What would that be like for you if [. . .]? Ask: What other reasons?
- Enquire about confidence:
  If you did make that decision to increase the amount of activity you do in the days when you don't come here for pulmonary rehabilitation, how confident are you that you could stick to it regularly? Ask for elaboration: What gives you that confidence? What could we do to help?
- Summarise the main elements of change talk (and sustain talk if it is necessary to do so): So, on one hand you have [sustain talk] but on the other [change talk]
- Ask about next steps:
  What do you see are the next steps? Would it be helpful if we [. .]

Problem-solving barriers to ongoing engagement

The aim:

- Help the patient (if ready) to problem solve barriers to ongoing participation that might undermine engagement and adherence.

Commentary:

Barriers to change that the patient has already experienced will likely have been raised during the previous strategy. You can ask if there are others that the patient anticipates in the future.

The strategy:

- Ask about barriers and encourage the patient to identify a workable solution to each one. Be careful not to jump in with solutions yourself. The risk if you do, is that the patient will either respond by telling you that it wouldn't work or give false agreement.
- If the patient asks for your input, or if you feel it may be helpful, then use the 3-stages of neutral information exchange.
- If the patient says I don't know, you tell me, you're the expert (perhaps avoiding taking responsibility) acknowledge the extent of your expertise and try to keep them engaged in the thinking process – challenging as it may be for them.

Sample dialogue:

- Ask about barriers: You mentioned that you are concerned about [. . .] or what things might get in the way of [. . .] What other difficulties do you imagine might get in the way of your plan?
- Ask about potential solutions: If that did happen what do you think you would be able to do? Or How could you overcome that should it occur?

Summarise the discussion

The aims:

- Convey understanding of the patient's situation
- Create hope and optimism about the future
- Demonstrate a willingness to re-explore issues in the future

The strategy:

- Summarise in non-judgmental terms the issue that you have been discussing.
- Reinforce the patient's efforts and any successes to date.
- Acknowledge any obstacles that have undermined adherence.
- Summarise their motivations for change and the strategies identified for overcoming anticipated barriers.
- End this component of the consultation on a positive note, by conveying optimism about the plan and a willingness to re-examine/update it, if and when the need arises.

Sample dialogue:

- Thank you for taking the time to talk with me today about the exercise part of your programme. I appreciate how honest and open you have been with me about the challenges you have experienced. Just to summarise what we have talked about - you have worked hard to become more active in your daily life but have found exercising during PR at a level that makes you breathe harder more difficult than you originally imagined. The main reason is because of your concern about losing control and not being able to get your breath back. We agreed that what we are asking you to do is not easy, and I appreciate your perseverance with it. You said that you are willing to work with me during PR sessions to try pursed lips breathing technique ….and we will review how this is working for you on an on-going basis. Getting fitter through exercise is something you really want to do. You said that this was because [main aspects of change talk]. How does that sound to you?

Appendix M Study 2: Results of multi-level modelling of Motivational Interviewing Treatment Integrity training outcomes

Table M-1 *Results of Multi-Level Modelling for Global Ratings of Evocation*

Adjusted means

		95% CI	
Time	**Mean**	**Lower bound**	**Upper bound**
4-month follow-up	3.47[a]	2.83	4.11
Post coaching	3.16[a]	2.62	3.71
Post workshop	2.60[a]	2.20	2.99
Baseline	1.58[a]	1.33	1.83

Note. Adjusted means for each time-point (adjusted for differences in the covariates).
[a]Covariates appearing in the model are evaluated at the following values: Time as a registered HCP = 14.05, Duration of PR delivery = 3.38.

Pairwise comparisons

		Mean difference		95% CI for difference[b]	
(I) Time	**(J) Time**	**(I – J)**	**Sig[b]**	**Lower bound**	**Upper bound**
4-month follow-up	Baseline	1.89	< .001	1.04	2.75
Post coaching	Baseline	1.58	< .001	.85	2.31
Post workshop	Baseline	1.02	< .001	.47	1.56
Post coaching	4-month follow-up	-0.31	1.00	-1.29	.67
Post workshop	4-month follow-up	-0.87	.06	-1.77	.03

Note. Based on estimated marginal means. Pairwise comparisons using baseline values as the reference (column J) indicate which time-points are different from baseline. Pairwise comparisons with follow-up scores as the reference group (column J) indicate whether follow-up scores are different from those observed at post-coaching, post workshop and baseline.
[b]Adjustment for multiple comparisons: Bonferroni.

Table M-2 *Results of Multi-Level Modelling for Global Ratings of Collaboration*

Adjusted means

		95% CI	
Time	**Mean**	**Lower bound**	**Upper bound**
4-month follow-up	3.42[a]	2.98	3.86
Post coaching	3.06[a]	2.62	3.50
Post workshop	2.96[a]	2.74	3.18
Baseline	2.07[a]	1.76	2.38

Note. Adjusted means for each time-point (adjusted for differences in the covariates).
[a]Covariates appearing in the model are evaluated at the following values: Time as a registered HCP = 14.05, Duration of PR delivery = 3.38.

Pairwise comparisons

		Mean difference		95% CI for difference[b]	
(I) Time	**(J) Time**	**(I – J)**	**Sig[b]**	**Lower bound**	**Upper bound**
4-month follow-up	Baseline	1.35	< .001	.71	1.99
Post coaching	Baseline	.99	< .01	.37	1.61
Post workshop	Baseline	.89	< .001	.49	1.30
Post coaching	4-month follow-up	-0.36	.45	-1.00	0.28
Post workshop	4-month follow-up	-0.46	.15	-1.05	0.13

Note. Sig = significance. Based on estimated marginal means. Pairwise comparisons using baseline values as the reference (column J) indicate which time-points are different from baseline. Pairwise comparisons with follow-up scores as the reference group (column J) indicate whether follow-up scores are different from those observed at post-coaching, post workshop and baseline.
[b]Adjustment for multiple comparisons: Bonferroni.

Table M-3 *Results of Multi-Level Modelling for Global Ratings of Autonomy Support*

Adjusted means

		95% CI	
Time	**Mean**	**Lower bound**	**Upper bound**
4-month follow-up	3.12[a]	2.61	3.63
Post coaching	3.32[a]	2.89	3.74
Post workshop	3.41[a]	3.16	3.67
Baseline	2.85[a]	2.51	3.18

Note. Adjusted means for each time-point (adjusted for differences in the covariates).
[a]Covariates appearing in the model are evaluated at the following values: Time as a registered HCP = 14.05, Duration of PR delivery = 3.38.

Pairwise comparisons

		Mean difference		95% CI for difference[b]	
(I) Time	**(J) Time**	**(I – J)**	**Sig[b]**	**Lower bound**	**Upper bound**
4-month follow-up	Baseline	0.27	1.00	-0.46	1.01
Post coaching	Baseline	0.47	.20	-0.16	1.11
Post workshop	Baseline	0.57	.03	0.01	1.08
Post coaching	4-month follow-up	0.20	1.00	-0.58	0.98
Post workshop	4-month follow-up	0.30	.80	-0.40	0.99

Note. Sig = significance. Based on estimated marginal means. Pairwise comparisons using baseline values as the reference (column J) indicate which time-points are different from baseline. Pairwise comparisons with follow-up scores as the reference group (column J) indicate whether follow-up scores are different from those observed at post-coaching, post workshop and baseline.
[b]Adjustment for multiple comparisons: Bonferroni.

Table M-4 *Results of Multi-Level Modelling for Global Ratings of Direction*

Adjusted means

		95% CI	
Time	Mean	Lower bound	Upper bound
4-month follow-up	3.50[a]	2.89	4.10
Post coaching	4.32[a]	3.91	4.74
Post workshop	3.21[a]	2.81	3.62
Baseline	3.66[a]	3.19	4.14

Note. Adjusted means for each time-point (adjusted for differences in the covariates).
[a]Covariates appearing in the model are evaluated at the following values: Time as a registered HCP = 14.05, Duration of PR delivery = 3.38.

Pairwise comparisons

		Mean difference		95% CI for difference[b]	
(I) Time	(J) Time	(I – J)	Sig[b]	Lower bound	Upper bound
4-month follow-up	Baseline	-0.17	1.00	-1.09	0.76
Post coaching	Baseline	0.66	.07	-0.05	1.38
Post workshop	Baseline	-0.45	.62	-1.33	0.44
Post coaching	4-month follow-up	0.83	.12	-0.17	1.83
Post workshop	4-month follow-up	-0.28	1.00	-1.11	0.55

Note. Sig = significance. Based on estimated marginal means. Pairwise comparisons using baseline values as the reference (column J) indicate which time-points are different from baseline. Pairwise comparisons with follow-up scores as the reference group (column J) indicate whether follow-up scores are different from those observed at post-coaching, post workshop and baseline.
[b]Adjustment for multiple comparisons: Bonferroni.

Table M-5 *Results of Multi-Level Modelling for Global Ratings of Empathy*

Adjusted means

		95% CI	
Time	**Mean**	**Lower bound**	**Upper bound**
4-month follow-up	3.79[a]	3.31	4.26
Post coaching	3.15[a]	2.72	3.58
Post workshop	3.18[a]	2.77	3.59
Baseline	2.11[a]	1.73	2.49

Note. Adjusted means for each time-point (adjusted for differences in the covariates).
[a]Covariates appearing in the model are evaluated at the following values: Time as a registered HCP = 14.05, Duration of PR delivery = 3.38.

Pairwise comparisons

		Mean difference		95% CI for difference[b]	
(I) Time	**(J) Time**	**(I – J)**	**Sig[b]**	**Lower bound**	**Upper bound**
4-month follow-up	Baseline	1.68	< .001	0.96	2.40
Post coaching	Baseline	1.04	< .01	0.37	1.71
Post workshop	Baseline	1.07	< .01	0.34	1.79
Post coaching	4-month follow-up	-0.64	= .17	-1.48	0.20
Post workshop	4-month follow-up	-0.61	= .13	-1.34	0.13

Note. Sig = significance. Based on estimated marginal means. Pairwise comparisons using baseline values as the reference (column J) indicate which time-points are different from baseline. Pairwise comparisons with follow-up scores as the reference group (column J) indicate whether follow-up scores are different from those observed at post-coaching, post workshop and baseline.
[b]Adjustment for multiple comparisons: Bonferroni.

Table M-6 *Results of Multi-Level Modelling for Global Ratings of Motivational Interviewing Spirit*

Adjusted means

		95% CI	
Time	Mean	Lower bound	Upper bound
4-month follow-up	3.37[a]	2.91	3.83
Post coaching	3.17[a]	2.81	3.54
Post workshop	2.97[a]	2.74	3.21
Baseline	2.17[a]	1.95	2.39

Note. MI spirit = mean of autonomy support, collaboration and evocation global ratings. Adjusted means for each time-point (adjusted for differences in the covariates).
[a]Covariates appearing in the model are evaluated at the following values: Time as a registered HCP = 14.05, Duration of PR delivery = 3.38.

Pairwise comparisons

		Mean difference		95% CI for difference[b]	
(I) Time	(J) Time	(I – J)	Sig[b]	Lower bound	Upper bound
4-month follow-up	Baseline	1.20	< .001	.58	1.82
Post coaching	Baseline	1.01	< .001	.50	1.51
Post workshop	Baseline	0.81	< .001	.46	1.16
Post coaching	4-month follow-up	-0.20	1.00	-0.84	0.44
Post workshop	4-month follow-up	-0.40	.31	-1.01	0.22

Note. Sig = significance. Based on estimated marginal means. Pairwise comparisons using baseline values as the reference (column J) indicate which time-points are different from baseline. Pairwise comparisons with follow-up scores as the reference group (column J) indicate whether follow-up scores are different from those observed at post-coaching, post workshop and baseline.
[b]Adjustment for multiple comparisons: Bonferroni.

Table M-7 *Results of Multi-Level Modelling for Mean of the Global Ratings*

Adjusted means

		95% CI	
Time	**Mean**	**Lower bound**	**Upper bound**
4-month follow-up	3.48[a]	3.02	3.95
Post coaching	3.39[a]	3.13	3.66
Post workshop	3.09[a]	2.90	3.27
Baseline	2.44[a]	2.21	2.68

Note. Adjusted means for each time-point (adjusted for differences in the covariates).
[a]Covariates appearing in the model are evaluated at the following values: Time as a registered HCP = 14.05, Duration of PR delivery = 3.38.

Pairwise comparisons

		Mean difference		95% CI for difference[b]	
(I) Time	**(J) Time**	**(I – J)**	**Sig[b]**	**Lower bound**	**Upper bound**
4-month follow-up	Baseline	1.04	< .01	.40	1.67
Post coaching	Baseline	0.95	< .001	.53	1.37
Post workshop	Baseline	0.64	< .001	.28	1.01
Post coaching	4-month follow-up	-0.09	1.00	-0.75	0.57
Post workshop	4-month follow-up	-0.39	.30	-1.01	0.22

Note. Sig = significance. Based on estimated marginal means. Pairwise comparisons using baseline values as the reference (column J) indicate which time-points are different from baseline. Pairwise comparisons with follow-up scores as the reference group (column J) indicate whether follow-up scores are different from those observed at post-coaching, post workshop and baseline.
[b]Adjustment for multiple comparisons: Bonferroni.

Table M-8 *Results of Multi-Level Modelling Percent Open Questions*

Adjusted means

		95% CI	
Time	Mean	Lower Bound	Upper Bound
4-month follow-up	46.01[a]	33.68	58.34
Post coaching	37.25[a]	28.83	45.67
Post workshop	29.83[a]	21.78	37.88
Baseline	16.88[a]	10.59	23.17

Note. Adjusted means for each time-point (adjusted for differences in the covariates).
[a]Covariates appearing in the model are evaluated at the following values: Time as a registered HCP = 14.05, Duration of PR delivery = 3.38.

Pairwise comparisons

		Mean difference		95% CI for difference[b]	
(I) Time	(J) Time	(I – J)	Sig[b]	Lower Bound	Upper Bound
4-month follow-up	Baseline	29.13	< .01	12.28	45.98
Post coaching	Baseline	20.37	< .01	7.87	32.87
Post workshop	Baseline	12.95	.03	.85	25.04
Post coaching	4-month follow-up	-8.76	.60	-26.39	8.86
Post workshop	4-month follow-up	-16.18	.08	-33.74	1.38

Note. Sig = significance. Based on estimated marginal means. Pairwise comparisons using baseline values as the reference (column J) indicate which time-points are different from baseline. Pairwise comparisons with follow-up scores as the reference group (column J) indicate whether follow-up scores are different from those observed at post-coaching, post workshop and baseline.
[b]Adjustment for multiple comparisons: Bonferroni.

Appendix N Study 2: Time investment

Table N1 *Time Taken by the Author to Train Participants (n=24) in Study 2*

Task	Number	Unit time (hours)	Total time (hours)
2-day workshop[a]	Workshop on 2 consecutive days (n= 3); 1-week separating training days (n=1); 2-weeks separating training days (n=2).	14 delivery + 4 preparation, travel and set up	108
MITI analysis (coding and report writing)	Baseline n=24, Post-workshop n=19, Post-coaching n=15, 4-month follow-up n=12 Total 70	1.5	105
Face-to-face feedback sessions based on MITI analysis	Post workshop n=19, Post coaching n=14[b] Total 33	0.75 delivery 0.5 average travel time[c]	41.25
Face-to-face coaching sessions	Completed 3 sessions n= 16 Completed 2 sessions n= 1 Completed 1 session n = 2 Total 52[d]	0.75 delivery 0.5 average travel time[c]	62.75
Scheduling appointments, sending reminder messages and telephone prompts to encourage completion			20[d]
Total time			**337 hours**

Note. [a]Workshop delivery to suit host organisation. [b]n=1 participant submitted a post-coaching sample but withdrew prior to feedback session. [c]Average travel time reflects varying distances to participants' workplaces and that meetings with different participants from the same site were organised consecutively, where schedules allowed, to keep travel costs to a minimum. [c]Two participants completed all 3 coaching sessions together. [d]Nominal figure as this time was not recorded.

Table N2 *Time Invested in Training Activities by All Clinician Participants Combined*

Task	Number	Unit time (hours)	Total time (hours)
2-day workshop	23 participants	14	322
Additional time to take consent and organise equipment for recording of practice sample	70 recordings	0.1	7
Feedback meeting	33 meetings	0.75	24.75
Coaching session	52 sessions	0.75	39
Total time overall[a]			**392.75**

Note. [a]This estimate does not include preparation time for MI-based consultations with patients (for example participants described reading notes, PREAMP intervention manual), or preparation for feedback and coaching sessions as part of supervision. As a refinement to training, participants in later training cohorts were encouraged to review recorded consultations ahead of scheduled coaching and feedback sessions.

Appendix O Study 3: Semi-structured interview guide

Study 3: Semi-structured interview guide

Introduction

Thank the participant for their involvement.

Assure confidentiality and anonymity.

Main Questions

What are your thoughts about using motivational interviewing as part of pulmonary rehabilitation?

What are the key challenges to using motivational interviewing in your practice?

How might the design of pulmonary rehabilitation programmes be improved to more fully integrate motivational interviewing?

What aspects of the motivational interviewing training did you find most useful?

What aspects of the training did you struggle with or find least useful?

What additional training and or support do you think would be helpful to further develop skills in this approach?

Closing Questions

Is there anything that you would like to say that I have not asked you?

Appendix P Study 3 Audit Trail

Table P-1 contains a summary of the audit trail performed within study 3 (trainee experiences). The audit trail provides information regarding the step-by-step decisions that were made and the reasoning behind them. This allows the reader to verify the author's activities and follow his analysis. Reflexivity represents a fundamental element of the audit trail. A reflexive account provides a critical account of the author's actions and acknowledgment of the impact of potential biases on the decisions made (Yardley 2015).

Table P-1 *Components of Study 3 (Trainee Experiences and Insights) Audit Trail*

Phase	Audit trail relating to process
1. Familiarisation	Reflexive account (see section P.1).
2. Initial coding	Table of initial ideas (see section P.2).
3. Developing a working analytical framework	Provision of analytical framework V1 and V9 with rationale for changes made (see section P.3).
4. Applying the analytical framework (indexing and sorting)	Memo highlighting challenge of coding material and evidencing transparency in decision making. (including need to be mindful of my propensity to be overly sensitive regarding negative feedback) (see section P.4).
5. Charting data into the framework matrix	Not applicable.
6. Interpreting the data	Reflection on process (see section P.5). Description of changes from analytical framework to final thematic map with commentary on decision making (see section P.5).
7. Producing the report	Reflection highlighting my propensity to fit data to theory and actions taken (see section P.6).

Note. RS = Robert Shannon (author of thesis); RSum = Rachael Summers (participant interviewer and member of PhD advisory team).
Adapted from "*Qualitative research practice: A guide for social science students and researchers*" by Ritchie et al. (2014) (2nd Edition). Thousand Oaks, CA.: Sage Publications.

P.1 Phase 1: Familiarisation

Reflection on process

I found this element of analysis more challenging than I had originally anticipated. On a cognitive level I was clear that any feedback from participants about their training experiences - be it good or bad - would be helpful in answering the research questions about the feasibility of the MI training package. On an emotional level, given that I had invested a significant amount of time and effort in organising and delivering the training and importantly had done the best job that I could, I felt nervous about hearing about what these clinicians thought. This anxiety was intensified knowing that an independent person (Rachael Summers) had interviewed each participant in an effort to gather their real views, rather than only those which were complimentary (as might have been the case had I interviewed them).

Whilst feeling anxious was quite understandable and in itself was not problematic, I noticed that it interfered with my analytical efforts by restricting the focus of my observations. I was aware of this tendency when I first listened to the recordings of the interviews, but the impact became more apparent during a meeting with a member of the research team (Rachael Summers) in which we discussed my post-transcription thoughts. My initial ideas tended to focus on the explicit content of what had been said. Part of this was because the original plan for the analysis was to code deductively based on the issues identified *a priori*. However, my concerns about how well my training was received led me to focus on the evaluative elements of participants' accounts with a particular emphasis on their reactions to the training. This was at the expense of noticing subtler, unexpected aspects of what had been said, for example issues relating to the culture and professional identity, that provided a context for understanding the learning and implementation issues that participants faced.

When Rachael pointed out these oversights, we explored their origins and discussed the importance of combining inductive (open coding) alongside deductive coding. I found it helpful to continually reflect on my own biases and preoccupations through each phase of the analysis to pre-empt any defensive reactions and to remain open-minded and receptive to the latent themes. I also found it helpful to discuss these issues with Rachael to maximise confirmability and credibility of the research (see Figure 6-1, page 147).

P.2 Phase 2: Initial ideas

Following transcription, I annotated each script with my initial thoughts about what had been said. The notes for the first three participants are provided in Table P2 to illustrate the type of comments I made.

Table P-2 Examples of initial ideas post transcribing

Participant	Idea
1	Keeping patient focused – giving control to patient
	Comfort with depth of conversation
	Learning is challenging, but participant is driven to improve and positive
	Could have done more personal work – but high workload
	Securing and submitting recordings – performance anxiety – need to be seen in a positive light by supervisor
	Good to do
	Challenge to achieve required depth
	Learning takes time – not much done outside formal training
	Discomfort with listening to recordings, but helpful.
	Coaching important, the key to it is being supportive
	Enhanced self-responsibility
	Helps patients to feel more in control
	Helps to be competent at basic assessment first (prior to MI)
	MI takes more time
	Have to be flexible with use of the strategies
	Senior clinician has more autonomy
	CCG focus sometimes at odds with MI
	Isn't always aligned with clinician preferences
	Securing recordings was challenging

Participant	Idea
2	Performance anxiety – wants to do well (felt under pressure)
	Listening to recordings was uncomfortable
	Difficulty with ambiguity and patient stress – emotion activation.
	Stressful – remembering everything
	Feels unnatural
	Disappointed in self with lack of progress
	Stressful when patients digress in the context of limited contact time
	Patients emote and finds it difficult to contain
	Wanted to quit – but motivation for continuing was to avoid letting people down
	Glad I did it
	Conflict – wants to do a good job, sees MI as being helpful to that goal and wants to be good at MI, but struggles to do it well in her mind despite putting in lots of effort. Lack of confidence undermines learning
	Coaching maybe an inherently threatening experience (just at this level?)
	Real play – personal disclosure challenging
	Challenged by coaching
	Momentum in learning interrupted by work demands (groups etc)
	Is flexibility in PREAMP not sufficiently evident?
	Busy work detracts from MI learning
	Keeping patients focused is an important skill
	Power differential in coaching
	Written feedback from coaching helpful
	Needs supportive work colleagues
	Ongoing work required to keep developing skills
	Some patients do not respond – intractable
	Some patients just tell you what they think you want to hear
	Identifying patient's own reasons
	? how it fits with band 3 position (relative to physios)
	If the whole team is involved, then the PREAMP manual needs to include material that is relevant to each person and the role that they take
	Needs to be flexible and fit in with different assessment formats
	Long break between assessment and programme start – patient motivation fluctuates
	Can be used outside formal consultations

Participant	Idea
3	Takes a while to get comfortable with it
	Open minded about it
	Rewarding to use MI – you find out more about patient
	Experience of clunky skills – awkward – a bit thrown
	Old habits die hard - MI takes a lot of concentration and is very cerebral (in part because it's new) - have to make a conscious effort to use it. When rushed or mentally fatigued it's not used
	Some additional work completed outside formal training
	Feedback could have been more critical
	Supervision valued -without it, good intentions may not have manifested in altered practice. Structure/follow-up/accountability/responsibility all maintained impetus.
	Experiencing MI through real plays was perceived positively because she experienced psychological change on a personal level
	Role-plays effective but less so
	Listening to recordings helpful
	PREAMP helpful as prompt
	Develops clinical skills – helps to motivate (and means you don't turn away un-motivated patients)
	This mirrors care that's provided for patients during PR for those who are less motivated/haven't joined.
	Modifying exercise outcome expectations is a need in COPD.
	Builds engagement and trust
	Positive experience in practice – winning people over encourages use
	CCG/practice networks focus on completion rates, may undermine care provided for less motivated subset (and detracts from MI use – but committed to MI it seems. MI training made her aware of that voice
	Managers/staff would need to see the positive impact of MI on the parameters that are measured/they are interested in
	Allowing pts more control takes additional time
	It's effortful
	Sometimes have to decide which 'bits' to use
	The key barrier to adoption may be more about how people perceive rather than service structure. Change requires an investment in effort/time at the outset
	Clinicians need to experience MI to see beneficial effects
	Implementation would require service wide adoption with associated training

P.3 Phase 3: Developing a working analytical framework

There were nine iterations of the analytical framework in total. Some of the revisions were minor, for example a change to the name or description of a code to more accurately reflect the meaning of all quotes and to better distinguish it from other, similar codes. Other revisions reflected more fundamental changes, for example the refocusing of a category with changes to the codes subsumed by it.

Several of these changes were prompted by ongoing exposure to the transcripts, reflecting on what was said and discussing insights gained with Rachael during supervision. These processes prompted me to rethink certain elements of my analysis, and as such might be considered a normal feature of rigour in a qualitative analysis. The revision process continued into the indexing phase. When none of the codes fit with what had been said, it was necessary to revise codes/code descriptions and then revisit previously indexed transcripts to ensure the revised codes were still appropriate.

Beyond this 'normal' rigorous approach, as a novice qualitative researcher there were inefficiencies in the coding element of my analysis. This resulted in my having to make several revisions to the analytical framework that might otherwise have been unnecessary had I been more skilled. Many of these issues became apparent through discussion during supervision.

One key shortfall was my not picking up on some of the latent themes that were evident in the data set. By way of explanation, the initial intention for study 3 had been to develop an analytical framework deductively based on the findings from study 2 that required deeper understanding and explanation. This would be supported through linkage to the declarative-procedural-reflective model. During transcription and the familiarisation processes I became aware that the data set contained elements of participants' experience that did not fit with the codes I had anticipated using but were nonetheless relevant to the research questions. This was reinforced during a meeting with Rachael (see reflective account within section P1). It was therefore necessary to combine deductive and inductive coding, whereby issues identified *a priori* were explored deductively, whilst open (unrestricted) coding was used to allow for unexpected elements of participants' experience. Whilst I was aware of this need, it did not translate sufficiently to my analytical efforts from the outset. I tended to focus on the deductive elements at the expense of the unanticipated issues, particularly the latent themes.

During supervision we discussed how open coding drew on a mindset similar to that involved in reflective listening, in that the listener should be open to what the client brings and focus on their experience without being distracted by their own thoughts and preconceived ideas. It was helpful to keep this in mind when reviewing transcripts. We also discussed how identifying

latent themes within participant interviews was similar to the process of constructing complex reflective listening statements in MI, whereby the listener considers the meaning of what the speaker said, rather than just the explicit content. This helped me to consider and be more receptive to the unspoken meaning within and across transcripts.

The next section contains the initial analytical framework that I developed and the final updated version. There is also a commentary on some of the changes that were made.

Table P-3 *Initial Study 3 Analytical Framework*

Category	Code	Code Description
Redirection of expert role Clinician perception of their role, and how MI differs from routine practice	A cultural shift	Reflection on the physio – nurse professional identity and the tension with MI.
	The person of the patient	The sense that the spirit of MI distinguishes it from routine practice and encourages clinicians to view patients differently.
	Beneficence v autonomy respect	Balancing the need to address each patient's medical needs whilst simultaneously respecting their freedom to choose. Contrasted with physio/nurse cultures.
The challenge of MI The impact of learning and implementing MI on the clinician	Destabilising	Heightened awareness of the limitations of well-entrenched practice for motivating patients, whilst simultaneously feeling underprepared to deliver MI effectively (the experience of learned helplessness).
	Committing to uncertainty	Committing to uncertainty in the direction, and content of consultations. The impact on 'the self-schema' of giving the patient more control in the consultation and decisions about their care.
	Performance anxiety	The emotional consequence of completing training activities with the potential for judgment by self and others (including me as the MI trainer).
	Burdensome	The work involved in developing skills and using MI in practice and the impact of that effort for the clinician.
	Stable /unstable	Perception of whether the burden of MI will change over time.
Optimising training & support The views of the MI training package and ideas for improvement.	Dual process	Preferred supervisory style. The need for flexible coaching in a non-judgmental, supportive framework - a style that mirrors MI with patients.
	Being me	The experience of developing a new therapist self. The need to develop own style within MI.
	Strategies & activities	The relative value of different training activities for developing MI attitudes, knowledge and skills.

Category	Code	Code Description
Implementing MI Service and programme issues that facilitate or undermine MI learning, adoption and implementation.	Support for learning	The need and means to facilitate a momentum in learning and refining MI skills.
	Programme structure	Opportunities to implement MI in the context of PR and programme design issues that influence usage.
	Balancing competing needs	Balancing the focus and priorities of the service and its commissioners with the individual needs of the patient. Includes consultation time.

Table P-4 Final *Study 3 Analytical Framework*

Category	Code	Code description
Redirection of roles Clinician perception of what MI is, how it differs from routine practice and the perceived impact for patients.	Shifting Culture Drivers / focus of current provision and implications. Fits in this code where the focus is the starting point, traditional practice.	The starting point that influences day to day practice within which clinicians operate. Drivers/influences: personal, educational, profession, commissioners, PR networks. Current provision: medical, physical/measurement focus, emphasis on completion rates, service driven by financial model. Implications: Only recruit highly motivated patients, emphasis on care post enrolment, invest less time with ambivalent patients, limited attention afforded to psychosocial matters. Differences between professions. Conflict/tension provoked by MI. Feels like the right thing to do/reinforces patient voice e.g. i) differential treatment of patients at intake consultation based on motivation; ii) medical model, clinician-centred practice.
	Perception of MI Process and outcome	Commentary on the philosophy, principles and skills of MI and what distinguishes MI from routine practice. Description of the elements have been useful in practice. The value for patients, clinicians and the service that is perceived and/or has been experienced. Imagined long-term benefits. Aspects of existing attitudes, beliefs and practice that are MI-consistent that have been reinforced through the study. Withholding judgment until I am better at it (recognises integrity/outcome link).
	Work for the patient	The in-session impact of MI on the patient. Reflection on patients' readiness to accept a more involved role in the discussion and decision making. Patients are not always expecting this or ready to embrace additional responsibility. Patients may avoid facing difficult material/emotions.

Category	Code	Code description
The challenge of motivational interviewing The personal experience of learning and implementing MI	Performance anxiety Anticipation of judgment by self and others whist undertaking study tasks (prior to during group training, with patients or supervision).	Implications of low confidence (internal focus).
	Destabilising Fits with this code when the focus is on the emotional experience of 'conscious-incompetence'	What it feels like to start using/integrating MI (in the moment). Recognising limitations of well-entrenched practice whilst simultaneously feeling underprepared to deliver MI effectively (includes psychology speak, risk of patronising, how to fit it into existing practice). Relates particularly to interpersonal skills e.g. realising you're not listening well, feeling unnatural. Having declarative knowledge but unrefined procedural skills (or unhelpful self-schema, therapist attitudes, beliefs, assumptions).
	Committing to uncertainty	Giving the patient more control in the direction and content of the consultation (particularly when focusing skills are under-developed). Involving patients in decisions about change and respecting autonomy. Cognitive, emotional and behavioural sequel of letting go of the perceived responsibility for change and giving patient's more autonomy. Concerns - is this relevant, where's it going, what if they decide not to change?
	Difficult feelings	Handling patient's emotions (perceived, anticipated). Concerns that the depth of conversation may raise emotive topics and cause upset. Holding/containing. Feeling uncomfortable when patients are upset –self-schema (emotional activation). Views about upsetting patients (self-schema rules translated into therapist attitudes and beliefs).

Category	Code	Code description
	Burdensome Fits with this code when the focus is on the perception of effort and the in-session cognitive challenge	The psychological effort/work involved in using MI for the novice. Trying new skills and de-automating well-entrenched ways of responding. Often described as a memory issue. Description of the challenges and the effort involved. Internal focus versus perceptual skills. Ability to accurately perceive patient's internal state. Inability to reflect in-action - moment-to moment. Is self-schema complimentary /helpful (naturally warm/empathic).
	Acquiring and refining therapist attitudes, beliefs, assumptions, knowledge and skills	Trajectory/over-time - roller coaster for some. Acquisition of declarative knowledge, development of interpersonal perceptual skills, reflective skills and self-as-therapist schema. Perception of stability/controllability in development. Includes progress in finding a way to make MI my own. (Not am I ever going to be able to do this - that's performance anxiety/destabilising).
Views of MI Training & Support The views of the MI training package and process, and ideas for improvement.	Strategies, activities and content	Personal perception of value and practicality of different training, supervision and assessment activities for developing MI attitudes, knowledge and skills. Relevance of content to meet the specific needs of patients with COPD considering PR. Includes PREAMP manual, securing recordings. Identified training needs to deal with the clinical challenges – e.g. identifying which patients to use MI with. Contrasts with organisational support code which takes a prospective view of service wide implementation (as opposed to personal experience and dealing with the clinical challenges).
	Style	Personal perception of the value and need for a particular teaching and supervisory style. Commentary on what was delivered The need for flexible coaching in a non-judgmental, supportive framework a style that mirrors MI with patients.

Category	Code	Code description
Implementing MI Service and programme issues that facilitate or undermine MI learning, adoption and implementation.	Integrating MI into the service	The specification of different tasks and responsibilities that compete for limited contact time within a consultation. Balancing the focus and priorities of the service and its commissioners with the individual needs of the patient. Includes prioritising safety and medical matters Availability of appointments of sufficient duration to allow MI (reference to funding issues). Opportunities to implement MI in the context of PR. Addressing the entire care pathway (e.g. quality of referral). Programme design issues that influence usage and effectiveness e.g. delay in starting PR post MI consultation.
	Organisational support for learning Barriers and facilitators Fits with this code when the focus is learning MI - prospective/service wide implementation.	The need and means to facilitate a momentum in acquiring and refining MI skills. Allowing enough time to learn. Protected time for learning activities including reflection and revision. Additional consultation time when skills are new. When clinicians get caught up doing other things meaning they have limited/no opportunities to implement MI and develop procedural skills. Includes cultivating an MI supportive environment. Normalising MI within standard operating procedures.

Commentary on changes between first (version 1) and final (version 9) analytical framework

Redirection of expert role (v1) converted to Redirection of roles (v9)

The original theme title reflected a relatively narrow focus (on the way the clinician views their role and the implications of MI). Participants also shared their views about what MI represented for patients in terms of increased involvement and responsibility and their reactions to this level

of participation. These perspectives were incorporated within the theme and therefore a title with a broader focus was required.

Several changes were made to the codes that this category subsumed.

1. 'A cultural shift' became 'shifting culture' with a revision to the description such that it captured all the drivers of the current PR provision. Previously this had been limited to issues of professional identity. However, the updated version also included issues relating to the commissioning of PR services and PR networks that shape service provision, which were evident in participant accounts.
2. 'Beneficence versus autonomy respect' was subsumed within the now broader 'shifting culture' code. This code was originally developed to capture issues relating to the selective recruitment of patients into PR and 'premature' discharge of patients based on sub-optimal attendance. Participant accounts indicated that these practices are intrinsically linked to service-related pressures and the need to meet performance indicators perceived to be important to service commissioners. This made it difficult to decide which of the two original codes ('beneficence versus autonomy respect' or 'a culture shift') to assign. The advent of the broader 'shifting culture' code resolved this tension.
3. The code 'person of the patient' was abandoned and replaced with two separate codes 'perception of MI' and 'work for the patient'. There are several reasons for this. The original code focused on different ways of viewing patients (competent versus deficient) and relatedly, the extent to which the MI training had modified participants' sense of their role in the behaviour change process. However, this code was conceived on the basis of my interpretation of what one participant had said, rather than a theme across transcripts. In this sense it was an example of my having (inappropriately) tried to fit theory to participant accounts.

   There was more evidence, however, of participants reflecting on the difference between MI and their normal practice, both in terms of the method itself and patients' responses to it. In light of this, I developed a new code 'perception of MI' with a description that captured theses broader issues. Several participants had reflected on the impact of MI for their patients, specifically their reactions to the increased responsibility for decision making and change. This warranted a separate code which I titled 'work for the patient'.

The challenge of MI

Two changes were made to the codes that this category incorporated:

1. An additional code 'difficult feelings' was added to this category to capture what participants had said about MI increasing the likelihood of patients sharing negative thoughts and feelings about their situation and their own reactions to this. I had recognised this as an issue but had previously conceptualised it as a component of destabilising. On reflection, it was a significant feature in several participants' accounts and for that reason I elected to generate an additional code to encompass those perceptions.
2. The first version of the analytical framework contained a code 'stable/unstable' which reflected participants' perception as to whether the cognitive burden involved in using MI would change over time as skills become more fluent. This is another example of my attempt to make the data fit with my preconceived ideas. On rereading the transcripts, it became obvious that this represented a small element of what had been said – and the focus of the code was too narrow. I therefore developed a code 'acquiring and refining therapist attitudes beliefs, assumptions, knowledge and skills' with a much broader focus to capture the different issues relating to the perception of development that had been voiced.

'Optimising training and support' converted to 'Views of MI training and support'

During supervision, we discussed how the original title reflected my desire to capture participants' ideas about how to improve the MI training package. We agreed it would be better to revise the title to reflect a more appropriate focus on participants' training experiences, from which I would deduce how to improve. Two changes were made to the codes subsumed within this category.

1. I removed the code 'being me'. There were several instances where participants had described how MI practice sometimes felt contrived and they had shared concerns about genuineness (see memo regarding one participant's use of the term 'psychology speak' within this appendix). I had found it difficult to decide whether to use the 'being me' or 'destabilising' code. Some discussed this issue in the context of how using novel skills made them feel in the moment (e.g. unsettled). By contrast, others talked prospectively, for example about a need to modify language used in the PREAMP intervention manual and the importance of developing their own style. In reality, these participants had been talking about the same broad issue, and as such it was important to use a single code. The code destabilising seemed most relevant, although it was necessary to modify its description to make sure the fit with the genuineness issue was clear.
2. The code 'dual process' was changed to the broader term 'style'. The initial term was excessively narrow in its focus and suggested that I had moved too much into the analysis of particular aspects of some interviews.

Implementing MI

Two changes were made to the codes subsumed within this category:

1. I collapsed the 'programme structure' and 'balancing competing needs' codes and named the composite 'integrating MI into the service'. The 'programme structure' code had been developed primarily on the basis of what one service lead had said about the differing opportunities for MI integration based on the type of programme offered (rolling versus cohort). On reflection, there was significant overlap between this, and the material coded with 'balancing competing needs' in the underlying issue - specifically the need to provide sufficient time and number of appointments to allow for MI integration. This made it difficult to choose between the two codes and prompted the new code 'integrating MI into the service'.
2. I renamed the 'support for training' code 'organisational support for learning' which focused on organisational level barriers and facilitators (for example providing protected time for training). This more focused name helped to distinguish it from the elements of participants' accounts that related to training support focused on delivery (e.g. supervision style).

P.4 Phase 4: Applying the analytical framework (indexing and sorting)

Memo regarding 'psychology speak'

Participant 6 (an experienced nurse) used terms such as '*psychology speak*' and '*stilted*' when discussing MI. I was not clear whether that referred to a negative perception of the value (and acceptability) of the approach, or to difficulties learning and implementing it.

I have copied relevant extracts from the transcription of this participant's interview below, with my commentary in red beneath. The ambiguity is evident in several of the extracts particularly those from earlier portions of the interview. The meaning becomes clearer however, when the extracts are considered together.

Extracts:

> *Um part of it that I find quite stilting and because it's so different to the kind of practice that I've normally done, um, was quite difficult to get used to. But there were parts of it that I adopted almost instantly* … (lines 6 - 8)

Commentary: Is 'stilting' a negative term or does it reflect a lack of fluency and discomfort with the unfamiliar?

> *Um, some of the things, you know I just thought, oh – I -because when Rob was doing it and he kept, you know he comes up with suggestions of to how to phrase things I just thought oh you know that is so like, psychology talk and practiced talk that I would find that quite difficult to adopt, but there were some things that were brilliant …* (lines 13 – 17)

Commentary: Is 'psychology talk' a negative term? Does 'practiced talk' mean lacking in genuineness? Does difficult to adopt mean that she does not see benefit of MI or just that it would be challenging to do well? The term 'but' is followed by an endorsement. Does that mean what precedes it is a negative thing?

> *… it was a bit psychology speak but it was actually it's asking for permission to - to give a, to offer different opinion that somebody may want to think about and that's quite empowering I think for the person* (lines 72 – 82)

Commentary: Here she seems to be referring to 'psychology speak' in a positive way. Is it more referring to something that she wouldn't normally say?

> *Yeah, I mean it did, it did feel very stilted, and I kind of thought "Oh my, what comes next?" You know "What comes after that kind of try to engage people and to motivate them and -?" and, so there were little gaps and pauses and thinking "Oh!" - and then I just went back into kind of normal talk and where, where we were and those were the things that Rob was brilliant at, because I think when you're just trying to fit it you're your normal practice and not giving yourself extra time …* (lines 136 – 141)

Commentary: The term 'stilted' is being used to describe practice that is not yet fluent and the quote indicates that as a novice she is struggling to integrate MI within existing consultation structures.

> *(Interviewer) I think you said a couple of times you've mentioned the word stilted, the initial kind of - can you tell me a little bit more about what that was like?*
>
> *I think, I think it's just that kind of "Aghh – where do I go now?" Oh – partly that – where do I go now? and stilted is partly just that- that sort of – I call it psychological speak that you know I'm kind of not used to – and I don't quite know what that means but it's almost saying exactly the right thing at the right time.* (lines 200 – 206)

Commentary: She is using the term stilted to refer to the effects of not having automated the skills and a lack of fluency (getting stuck/not knowing where to take the conversation). She also refers to a difficulty finding the right words (possibly to convey deeper levels of understanding, reframe something that the patient has said, or to direct the conversation in a particular way).

> *I mean my view of what I remember about the workshop was I kind of sat there thinking, "Oh – he's just always got the right thing to say." Um because it is perfect, you know that just the right thing and you know I thought, "Oh you know, how many years has he been doing psychology for - to almost have those sayings that just seem to come naturally?" Um, and so it was a bit of "Oh I don't know if I can ever do this" you know it's just um -. But then that continued subsequently, so it's just a different way of looking at things. And, and ultimately everybody has to find their own way of saying things, you can't - I mean you can adopt other people's things but as long as they fit in with you, otherwise it feels a bit false. But yeah, I was, I still feel quite amazed at the way Rob can come up with these sayings that are just right.* (lines 372 – 381)

Commentary: Participant reflects positively on skills that were modelled. She expresses concerns about being able to deliver MI but recognises part of the challenge is about developing her own style – presumably so it does not feel contrived.

> *…in terms of the negative sides of it - I suppose there is - like I talked about them before the kind of – the sort of stilted practice, but that's just until you've adopted it and made it your own. ... No, but generally I, I feel that with time and practice it could make a big difference to – and not just rehab, I know this is specifically rehab, but I think a lot more in other ways too.* (lines 489 – 495).

Commentary: This quote seems to reinforce my interpretation of the previous one in that an important component of learning MI relates to personalising the approach. She also refers to the importance of developing fluency with the skills. There is a overt endorsement of the approach.

Overall, it seemed that participant 6 had used the terms *psychology speak* and *stilted* to describe the (challenging) experience of using MI prior to having developed fluency with the skills and ahead of developing her own style. To me, these terms were not being used to describe an inherent 'problem' with MI. In this sense, I assigned the 'destabilising' code (that formed part of '*The challenge of motivational interviewing*' theme in the final report) when she used these terms. She recognised a distance from her desired practice but reflected positively on the end goal

('*saying exactly the right thing at the right time*'). In the context of the declarative-procedural-reflective model this relates to developing when-then-rules and having sufficient fluency with procedural skills that allows for the involvement of the personal self to avoid it feeling contrived and mechanistic.

P.5 Phase 6: Interpreting the data

Reflection on process

When I initially embarked on this phase of the analysis, I had difficulty discerning the difference between what Ritchie et al. (2014) were advocating in their description of 'Interpreting the data' and what I had already completed in the previous phases of the analysis. Through supervision, it became clear that I had already undertaken a good deal of interpretation during the previous three phases (developing a working analytical framework, applying the analytical framework, and charting data into framework matrix). The final thematic map presented in Figure 9-1 (page 249) was therefore similar to the final analytical framework (version 9 presented in table P4 in Appendix P.3).

The modifications that were made to derive the thematic map are described in the next section.

Final thematic map

A thematic map is a way of providing a coherent story with clear connections between the concepts and alignment with the research objectives (Ritchie et al. 2014). As described in the reflection above, since a significant amount of interpretation had already been completed prior to the actual interpretation phase, the thematic map I developed for study 3 was similar to the final analytical framework used to index the transcripts.

The next section contains a summary of the important decisions that were made when developing the thematic map.[42]

1. Cultural context. This was a significant feature of participant accounts. It was deemed sufficiently important an issue in relation to the research questions to warrant its status as a

[42] The analytical framework contains a set of codes (basic ideas or concepts) that are grouped into categories. Categories are defined as 'clusters of codes with similar meaning or interrelated ideas' (Gale et a. 2014, p. 2). By contrast, the thematic map contains a set of themes and associated sub-themes. Gale et al. define these as 'interpretive concepts or propositions that describe or explain aspects of the data' (p.2). The distinction between the terms used in the analytical framework and thematic map (codes versus sub-themes and categories versus themes) reflects the interpretative effort invested in deriving the thematic map.

theme in its own right. The focus is on the culture within which participants operate and in particular the service and professional drivers of normal practice that sit in tension with MI. This provides a context that help make sense of the difficulties that some participants had in learning MI and implementing it in practice.

2. Challenge of 'motivational interviewing'. The idea that MI is challenging was a ubiquitous feature of participant accounts and as such constituted a theme. It was clear from the framework matrix, that there was a temporal dimension to the challenging nature of MI. I therefore arranged the sub-themes on the basis of whether the challenge occurred 1) as participants were 'preparing for MI' for example having to commit to uncertainty; 2) 'during MI' for example dealing with difficult feelings or 3) through a process of reflection following training or a patient session that provoked curiosity 'reflection on practice'.

   There was evidence that insights gained through MI training process prompted some to re-evaluate their position with regard traditional practices (for example the selective recruitment of patients). This material had originally been subsumed within the 'shifting culture' code of the analytical framework. It was moved to 'The challenge of motivational interviewing' theme given that the MI training had *challenged* these participants' pre-existing beliefs (or made salient competing values that had largely been unrecognised up to that point).

   Participants perceived that MI based consultations were challenging for patients as well as for themselves. They commented that not all patients were expecting to be as involved in discussions about their own care or were ready to assume additional responsibility for change. The code 'work for the patient' captured these ideas and was subsumed in the 'redirection of roles' category within the analytical framework. In the context of the research questions (specifically the difficulty some had demonstrating skills in practice) the salient feature of this code was that patients' lack of readiness for this added responsibility was perceived to make it more difficult for these clinicians to use MI. For that reason, these insights were captured within 'The challenge of motivational interviewing' theme (in a sub-theme titled 'patient readiness for role-change').

3. I did not include material from the 'perception of MI' code in the final thematic map as it was not directly relevant to the research questions.

4. The final theme was called 'Lessons learnt from the future'. This combined the 'views of training support' and 'implementing MI' categories from the analytical framework. It

captured participants' insights about how the MI training might be improved and the service-level changes that were perceived necessary to support the integration of MI into routine practice. To better represent the content of the sub-themes, I made some minor changes to the name of codes prior to using them as sub-themes within the thematic map.

P.6 Phase 7: Producing the report

Reflection on process

The final element of the analysis involved writing the results (see section 9.4, page 248) and discussion (see section 9.5, page 286) elements of the report. Feedback on an early draft of the results section provided by a member of the research team (Rachael Summers) highlighted that some of the quotes I included did not entirely fit the narrative I had written. For example:

My text:

Several participants attributed much of the difficulty with this aspect of MI to a strong righting reflex, believing that as a *helper,* they should protect patients from uncomfortable feelings and that they may harm patients if they dwell on issues that result in negative emotions. They admitted to curtailing the conversation long before the full therapeutic benefit had been realised:

> … *it's that righting reflex – you always want to make everything better. You always want to say things that are going to make them feel better, give them something that will make them be better, improve their condition etcetera* …
>
> *(Participant 5 - non-completer, physiotherapy; lines 116-119)*

Feedback:

(Rachael Summers) Consider this statement, is this the participant's reflection or yours? Maybe the quote needs a little more adding to it from the main transcript, because at the moment I can't see anything in the quote below about 1) them acting on the righting reflex (only **wanting** to make things better), or 2) the righting reflex curtailing any therapeutic effects.

We discussed these issues during supervision and concluded that part of the problem related to a lack of thoroughness on my part, but that it was also evidence of a tendency to try and make the quotes fit a pre-conceived narrative. An important component of the analysis therefore, involved ensuring a good fit between all of the quotes and associated narrative. In some instances, this necessitated my selecting a different quote that better represented the point

being made, or extending the quote by adding words from the main transcript. It was also necessary to modify some of my commentary as in the example above. For this the revised narrative read:

"This participant attributed the difficulty of this aspect of MI to beliefs about her role in protecting patients from uncomfortable feelings and concerns that facilitating a discussion in which patients confront their choices may be detrimental to their relationship."

Appendix Q Published work based on research contained within thesis

Q.1 Journal article

Shannon RJ, Donovan-Hall M and Bruton A (2017) Motivational interviewing in respiratory therapy: What do clinicians need to make it part of routine care? A qualitative study. *PLoS One* 12(10): e0187335.

PLOS ONE

RESEARCH ARTICLE

Motivational interviewing in respiratory therapy: What do clinicians need to make it part of routine care? A qualitative study

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Data Availability Statement: The raw data for this study are the audiotaped conversations which will not be uploaded because consent was not sought for this at the time. Transcripts of these will be uploaded onto PURE (http://library.soton.ac.uk/research/pure). Consent was only given for 'excerpts' of the transcripts of the data to be used outside the research team. These will be available on request from the University of Southampton Ethics Committee (rgoinfo@soton.ac.uk).

Abstract

Motivational interviewing (MI) is a method for building motivation for behaviour change that has potential for use in respiratory contexts. There is a paucity of published research exploring the feasibility of this intervention from the clinicians' perspective. This study aimed to explore respiratory clinicians' views of MI: Is it perceived as useful? Could it be integrated into practice? What training would be required to make it part of routine care? Nine respiratory clinicians attended a one-day MI workshop and a semi-structured face-to-face interview two weeks later. All interviews were audio-recorded, transcribed verbatim and analysed with thematic analysis. Four main themes are presented—1) MI's suitability for use in respiratory contexts: participants saw potential in using MI to motivate their patients to engage with prescribed respiratory interventions, such as increased physical activity. Those who experimented with new skills post-workshop were encouraged by patient responsiveness and outcomes. 2) MI's relationship with routine clinical practice: some believed they already used elements of MI, but most participants felt MI was fundamentally 'different' to their normal style of working. 3) Implementation issues: additional time would need to be made available to enable an appropriate depth of conversation. 4) Training issues: Participants sensed the complexity of MI could make it difficult to learn and that it would take them time to become competent. On-going supervision was perceived as necessary. One key challenge identified was how to suppress behaviours that are antithetical to MI. These findings lend support to the feasibility of using MI in respiratory contexts such as pulmonary rehabilitation programmes, but highlight implementation and training issues that would need to be overcome. The insights have informed the development of another study, testing the effect of a tailored training package on MI skill, specifically for respiratory clinicians delivering pulmonary rehabilitation programmes.

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Competing interests: The authors have declared that no competing interests exist.

Introduction

The success of therapy for many conditions is influenced by the extent to which patients engage with their treatment and adhere to the activities and lifestyle changes that are recommended to them. However, in the respiratory field, making such changes usually requires a high degree of effort and motivation, and poor adherence is common [1–3]. An important task for clinicians working in this area, therefore, is enhancing motivation for behaviour change. This paper provides insight into clinicians' views of an approach to changing health behaviour (motivational interviewing) adapted specifically for respiratory patients.

Motivational interviewing (MI) has been defined as "a collaborative conversation style for strengthening a person's own motivation and commitment to change" [4]. According to MI theory, unresolved ambivalence—the experience of being torn between conflicting, yet co-existing motives—is what is most likely to undermine sustained behaviour change [4]. Patients with respiratory conditions may be motivated to change their behaviour (mobilise, exercise more, stop smoking) to improve their health, but simultaneously lack confidence in their ability to succeed, or may perceive that the personal costs, such as the time and effort it takes, to be insurmountable. MI seeks to create a supportive, empathic atmosphere whilst gently encouraging patients towards thinking about and verbalising their own motivations for change, as well as considering how their current behaviour is influencing their ability to lead the life they ultimately want [5]. The aim is to help patients to explore and resolve their ambivalence.

Meta-analyses of MI across behaviours and contexts have shown that MI can be effective in encouraging behaviour change, and also efficient, often taking less clinician time to achieve change than comparison interventions [6–8]. The strongest evidence for MI comes from the addictions field, where it was originally developed; although there is emerging evidence for its utility in health contexts [6, 9, 10]. The motivation and adherence issues that present in respiratory contexts closely resemble those where MI has been shown to be useful, which is why there is currently some interest in using it to help patients with respiratory conditions [11–13]. Although there is some evidence for this application of MI, the work tends to be limited by small sample sizes and insufficient reporting of treatment fidelity [14–19]. To be considered a genuine test of MI, trials need to: 1) confirm that the intended intervention contains all key elements of MI (engaging, focusing and evoking) rather than simply stating it was informed by, or contained strategies derived from MI; 2) demonstrate that interventionists had met specific proficiency criteria prior to the trial; 3) report the integrity of MI delivery during the trial; and 4) report the reliability of integrity measures used [20].

One particularly useful application of MI is where it is used in combination with other established interventions. When MI has been used prior to, or alongside, other established interventions, it has been reported that attendance, engagement and long-term outcome all improve [8, 21]. This suggests that one potential respiratory application of MI is to use it to extend and prolong the known beneficial effects of pulmonary rehabilitation (a programme comprising exercise and educational elements) for people with COPD.

Before recommending the transfer of MI into other contexts such as pulmonary rehabilitation, it is important to test its effectiveness within these patient groups. A necessary pre-requisite for designing a definitive trial in this area is to undertake qualitative work to identify the perceptions of the professionals who would be responsible for delivering the intervention in everyday practice [22, 23].

The aim of this study was to establish:

- do respiratory clinicians feel that MI is a useful intervention?
- do respiratory clinicians feel that MI could be integrated into their routine practice?

- do respiratory clinicians believe that they can deliver MI as intended?
- are there any training issues that respiratory clinicians foresee?
- what might prevent MI being delivered within clinical practice?

Method

Design

A qualitative design involving semi-structured interviews and thematic analysis was used to answer the research questions. We were interested in gathering respiratory clinicians' attitudes, beliefs and feelings regarding MI, and therefore a qualitative design was appropriate. A semi-structured interview approach was selected because this gave the adequate balance between providing the structure and focus of the pre-determined interview schedule, with the flexibility of open-ended questions and use of follow-up questions and prompts [24]. As the aim of the study was to understand the individual experience of the participants, this was considered more appropriate than a focus group approach, which could have led to issues with sharing views in front of other participants, plus the logistics of arranging a group meeting for busy clinicians. Thematic analysis was selected, because it is a flexible approach with theoretical freedom, that can provide "a rich and detailed, yet complex, account of data" [24].

Recruitment and participants

Following attendance at a one day 'Introduction to Motivational Interviewing workshop' run by the first author (RS), all attendees (n = 18) were given a study recruitment pack inviting them to take part in a qualitative study to explore their views of the use of MI within the respiratory setting (see S1 Table for details of the MI workshop). Those interested in participating were asked to make contact with a member of the research team (MD-H) to arrange a suitable time to obtain consent and undertake the interview. This resulted in a convenience sample of nine female clinicians (three physiotherapists, four nurses, one occupational therapist and one rehabilitation assistant) who worked in a respiratory service (in-patient and out-patient) within a community hospital in the South of England.

Researcher background

In the service of transparency, we provide contextual information about the authors in this section, to enable the reader to make judgments about the how our backgrounds, pre-existing beliefs and experiences might have influenced the research [25]. The first author (RS) delivered the 1-day introductory MI workshop and with support, analysed the interview data and wrote the manuscript. He is a Chartered Sport and Exercise Psychologist who teaches healthcare communication (with a focus on encouraging health behaviour change) to allied health professionals and nurses at both pre and post registration levels within the Faculty of Health Sciences, University of Southampton. He has been delivering training in MI for over 20 years and is a member of the Motivational Interviewing Network of Trainers, an international organisation that aims to promote high quality practice and training. He embarked on the present study, therefore with a sound knowledge and experience of MI, but with some potential for bias in favour of its use. This research is the first of three studies that form his PhD, focused on the feasibility of MI for promoting adherence to physical activity recommendations as part of pulmonary rehabilitation. He is being supervised by the co-authors of this paper (MD-H & AB). MD-H is a Health Psychologist, Senior Lecturer, and experienced qualitative researcher.

She interviewed the participants following the workshop and supported RS in the analysis of the interview data. AB is a Professor of Respiratory Rehabilitation with a clinical background in respiratory physiotherapy who leads Respiratory Research within the Faculty of Health Sciences, in which one of the key themes is adherence to therapy. She had input into the initial research design, and both she and MD-H have contributed to all drafts of the written report.

Procedure

Ethics approval for the study was obtained from the National Health Service Integrated Research Application System (REC Reference Number: 06/Q1704/33). The second author (MD-H) interviewed each participant individually face-to-face after having gained written informed consent. She observed the workshop but was otherwise independent. The interviews were carried out approximately two weeks after the MI workshop, so participants had already had an opportunity to reflect on what they had learnt in the context of their routine practice. During the semi-structured interviews MD-H explored topics relating to 1) what the participants remembered from the workshop and their views about its content, 2) whether they thought they could implement the skills in their current practice, 3) what they thought were the key challenges in implementing the approach, and 4) what training needs they anticipated having in order to deliver motivational interviewing skilfully (please see S1 Text for interview schedule). The interviews lasted between 20 and 50 minutes and were carried out within a hospital setting. All interviews were audio-recorded and transcribed verbatim, however the transcripts were modified where necessary to preserve confidentiality and anonymity.

Data analysis

A systematic approach to thematic analysis described by Braun and Clarke [24] and recommended by others as best practice [26] was adopted. The phases summarised in Table 1 were completed. These phases are recursive, meaning that it was necessary to return to earlier stages frequently, to ensure consistency between the themes and data.

Analysis was not theory driven so codes for the emergent themes were developed inductively from the interview transcripts. In this sense they are closely linked to the participant

Table 1. Phases of thematic analysis adapted from Braun and Clarke (2006) [24].

Phase	Description of Process
1. Data familiarisation	Audio-recordings of interviews were transcribed verbatim (RS). Transcripts were read and re-read (RS). Initial ideas were noted (RS)
2. Generating initial codes	Systematic coding of entire data set on a line-by-line basis was performed (codes were assigned to chunks of data—words, sentences or paragraphs) (RS). Extracts of data relevant to each code were collated (RS). Written reflection on interesting features was produced (RS).
3. Searching for themes	Excerpts from each code were re-read (RS). Codes were collated into potential themes (RS).
4. Reviewing themes	Research team members checked whether the themes worked in relation to the coded extracts (RS, MD-H). All transcripts were re-read to establish whether themes worked in relation to the data set (RS).
5. Defining and describing themes	On-going analysis was performed to refine the specifics of each theme and the overall narrative of the analysis (RS, MD-H). Research team members checked that each theme captured something important in relation to the overall research question.
6. Producing the report	Appropriate examples of extracts that best represent each theme/subtheme were selected (RS, MD-H, AB). The analysis was linked to the research questions and literature (RS, MD-H, AB). A final written report was produced (RS, MD-H, AB).

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narratives and the authors made a conscious effort to prevent any preconceived ideas and knowledge of MI from constraining the analysis. On-going reflexive dialogue within the team throughout the analytic process served to maximise the correspondence between participants' description and the authors' representation of them. Themes were identified primarily from the explicit content of participant interviews, though it was necessary to examine latent themes regarding participants' perception of motivational interviewing in relation to normal practice. The sub-theme 'It is quite foreign at first', therefore drew on ideas and conceptualisations that were thought to underpin their views about the potential of MI in their work.

Strategies were employed to maximise the trustworthiness of the analysis and reporting [27]. The on-going reflexive dialogue within the team, mentioned above, helped to ensure adherence to the analytical method and minimise bias in the interpretation of the interview data. Constant comparison was used to systematically develop and refine the content of categories during coding and generation of themes. Finally, an audit trail was developed (available from corresponding author on request) detailing the decisions that were made together with their rationale and acknowledgment of the impact of any potential bias.

Results

The findings are described under the four main themes that emerged from the data.

Theme 1: Motivational interviewing's suitability for use in respiratory contexts

Most participants talked favourably about the use of MI within the respiratory setting. They believed that MI improved the relationship that they had with patients and had the potential to be an effective method to motivate patients to change behaviour. Participants described it as a pragmatic approach that might be used in several situations in their clinical practice: smoking cessation, mobilising, exercise, reducing alcohol consumption and modifying diet.

> *". . .I could see and every example they gave just made so much sense. It's um, it is something that I would like to pursue."* [Participant 3, Physiotherapist]

The potential of MI to promote engagement and commitment to pulmonary rehabilitation was also discussed. Sometimes patients agree to attend for the programme but are at a high risk of drop out because at the time of committing to it, they do not appreciate the intensity of exercise that is involved or the requirement for additional physical activity between group sessions.

> *". . . but it's so hard . . .. but they present themselves for a pre assessment session and they all come in and their whole body language is of ahh, what am I signing up for here?"* [Participant 2, Physiotherapist]

Another participant described how some patients are reticent about making changes in their physical activity because of a fear of breathlessness. The style of MI was perceived to be helpful in these circumstances.

> *"Umm the other thing is exercise for our pulmonary rehab. . .. trying to encourage people that are breathless to exercise is really difficult but they are so scared of their breathlessness anyway."* [Participant 4, Nurse]

Following the workshop, without prompting, several the clinicians tried out some of the skills they learnt about in their practice. One of the physiotherapists noticed greater responsiveness from patients whilst using MI as compared with her normal way of working.

"Umm, but I have had a little bit of go on certain patients on the ward. And I think what I have done, it does, you see quite a different reaction from the patient, they seem to have a lot more belief in what you are trying to encourage them to do." [Participant 8, Physiotherapist]

Another participant, an Occupational Therapist described beneficial effects of MI which reinforced her belief in its effectiveness.

". . . I worked with a particular patient in a different way and had a very good outcome, umm which I was really—it was really positive and also another person on the course, the other physio, we worked together with this patient in the same way, umm and you could see it did work." [Participant 5, Occupational Therapist]

Reflective listening seemed to be an important new skill to clarify their understanding of what the patient had said. This helped to improve the quality of the relationship that they felt they had with the patient.

"Not that I didn't listen before but I think actually taken on board maybe more what they are saying and showing that I understand whereas before you might listened to a patient and then you say right okay that's good let's, now because I'm paraphrasing what they're saying to me it shows them that I have actually listened to what they've said and I think you get a much better rapport that way with patients and they're more willing to do what you want them to do." [Participant 8, Physiotherapist]

Underpinning these views was recognition that a change in the clinician's practice behaviour leads to changes in how patients respond. For example, participants observed less passivity, reduced resistance and greater levels of motivation for change from patients.

"Yeah we had a patient in who'd been in quite a while she was very good she could move quite well and she just would refuse a lot of the time, and I'd get frustrated, she'd get frustrated and it wasn't, you know, it wasn't bad but it was just both were getting frustrated and were going anywhere so I tried, myself and another colleague who did it and we tried the motivational interviewing . . .. we did get her to transfer really well and not and she was quite shaky before but this time she was a lot better." [Participant 9, Physiotherapist]

Arguably the strongest support for its use came from a nurse participant who valued it so much that she was concerned that she might relapse back to old ways of working. Here she refers to her righting reflex—the natural helping inclination to provide advice at the expense of evoking the patient's ideas, which has the potential to trigger resistance and undermine engagement.

"I just hope I continue to use and that my own reflex, righting reflex, and my own previous assessment techniques don't just slip back in as a bad habit, you know, I am worried that I will get one tired week or one bad week and start going back to how I was before." [Participant 4, Nurse]

Theme 2: Motivational interviewing's relationship with routine clinical practice

"I do this already". Whilst MI represented a novel way of working for most participants within this sample, some believed that they were already using elements of the approach, prior to the workshop.

> *"But I think I do I do have aspects of motivational interviewing in me anyway when I talk, when I listen. . ."* [Participant 9, Physiotherapist]

One participant felt that her previous training in counselling, combined with her clinical experience meant that she had developed her own way of consulting with patients about behaviour change. When questioned on whether the workshop had prompted any changes in her practice she said:

> *"I'm going to have to be very frank here and say not an exceptional amount because I've been dealing with them for a long time, I did a counselling course some years ago and that taught me quite a lot."* [Participant 2, Physiotherapist]

Another participant described the workshop as having consolidated many of the skills that she had developed instinctively.

> *"Yeah I did feel that I was doing most of it anyway. But for somebody to tell me that this is what we do and this is why we are doing it. And I thought oh, actually that makes perfect sense yeah."* [Participant 1, Nurse]

We had anticipated that some participants might perceive similarities between MI and their routine clinical practice. MI has been described as a refined form of guiding that is patient-centred and draws on skills such as asking, informing and listening that are often used in everyday practice [28]. On first exposure, MI can appear deceptively simple; a fluid conversation in which the patient is engaged and becoming increasingly committed to the change side of their ambivalence. Some of the skills may be familiar to an observer, though the strategy underpinning the specific way they are used may not be so obvious [29]. Monitoring and responding to patient reaction on a moment-by-moment basis, attending to the unspoken meaning of what the patient has expressed, as well as arranging the conversation in a way that encourages the patient to explore and resolve their ambivalence, are examples of MI components that are not immediately apparent and are difficult to discern following a brief workshop.

When explaining which elements of MI they felt they were already using in their practice, most described a general patient-centred orientation, rather than anything that is unique to MI. This suggests that the workshop had not been successful in helping these participants make sense of all the elements that make MI different:

> *"Well I always go on the patient's past history and what they prefer and how they would like to be cared prior to coming into hospital. I always try and research that from the carer and the patient as to what their habits were, when did they try different things before, umm to try and change their behaviour."* [Participant 7, Nurse]

One participant expressed uncertainty as to whether she was using MI or not, and described the open nature of her consulting style:

"Yeah, probably not in the way it was completely phrased or [workshop facilitator] *put it across but yes, I think, and it's personal that I ask too many closed questions and not open questions but I do allow the patient to talk quite openly and freely."* [Participant 2, Physiotherapist]

Whilst the above descriptions are compatible with MI, they do not reflect the refined use of the skills, or the underpinning strategy that distinguishes MI from everyday patient-centred conversations. The comments suggest an oversimplified picture was presented, that resulted in some participants believing they were already using MI.

"It is quite foreign at first". Many participants did recognise differences between what was taught in the workshop and what they normally deliver in practice. One participant lamented her reliance on advice giving:

"Um, I'd still listen, but I don't think I'd probably, I'd probably more bombard them with advice and say look it's important you do this because of this. . ." [Participant 9, Physiotherapist]

Others spoke about the need to think about the specific language that they use and the benefit of evoking the patient's perception of their problem.

"I remember thinking at the time I am definitely going to do that. I can see there's a genuine benefit of just, you know letting the patient tell you what the problem is." [Participant 1, Nurse]

Although MI draws on some familiar skills, most of the participants believed MI to be fundamentally 'different' to their current style of working.

"*But I found just the whole way of posing the questions and being open and maybe a little bit more um I don't know, non-judgemental about your approach to interviewing with a patient."* [Participant 3, Physiotherapist]

For the majority, the philosophy and practice of MI was perceived as antithetical to their normal way of encouraging behaviour change. It calls for a re-direction of their 'expert role' from one in which the aim is to install motivation through the provision of expert advice, to one which relies on empathic counselling skills to carefully draw out and reinforce the patient's own reasons for making changes.

". . . I thought before that when they had been to their GP, the GPs probably waved a finger and said you most give up smoking it is bad and so when they come into me because I try and be friendly and nice about I feel that I was doing a better, but I was actually doing the same thing just in a different tone of voice." [Participant 4, Nurse]

Practicing MI, therefore, often necessitates the suppression of tacit, over-learned counselling habits that run counter to its collaborative, evocative and autonomy respecting style. This need is reflected in the following quote from participant 4:

"I think the main thing was we kind of all discovered as healthcare professionals that our righting reflex was really strong and when we were trying to do the role plays we were automatically trying to correct what people were saying, they were saying 'oh I can't do this' and we were saying 'yes you can you can this because this that and the other'." [Participant 4, Nurse]

Although participants had previously experienced some success with advice giving to encourage behaviour change, with sufficient success to reinforce this style of working, they also thought its effectiveness was limited. Furthermore, they voiced concerns regarding its potential for undermining rapport and increasing patient defensiveness.

".. don't just force your, not your opinions, but the health information on someone because sometimes they've heard it so many times before like the smokers and things and it's trying to work out why it hasn't worked rather than just bombarding them with it because it's not going to have any effect they'll just deflect it like they have with any other professional." [Participant 9, Physiotherapist]

Another difference between MI and routine practice that participants discussed was the proportion of talk time occupied by the clinician and patient. Participant 4 discussed how she had previously viewed silence as a cue to say more, and thus would dominate the consultation. Using skills such as silence to encourage involvement was novel and felt awkward, but was viewed positively.

"It is getting more comfortable, it is quite foreign at first, particularly just not talking. . .. because I think particularly my own personality problem is the fact that there is a silence I will try and fill it in and if there is a patient in front of me I think that if there is silence they're asking me to tell them something so I'll then continue to give them more and more advice, so just sitting back and letting there be a silence, does mean that actually they will generally start talking themselves and continue to talk about their areas." [Participant 4, Nurse].

Most participants indicated that they reflected on their normal consulting style as a result of the introductory workshop. One in particular evaluated it quite negatively:

"I am just information giving yeah continuously, it makes me sound like a bully, I don't think it is bullying at the time." [Participant 4, Nurse]

Although an awareness of the difference between the style and focus of MI and routine practice maybe a precondition for learning the method, this quote suggests that being introduced to MI and trying out the skills with patients can be somewhat destabilising. Another physiotherapist indicated that she uses closed questions almost exclusively in consultations.

"As physios we maybe used to expecting an answer and almost give a prompt to the patient in your questioning we give a prompt rather than allow them freely to give the information over to you. Pretty well the clearest things [from the workshop training] *were how you question patients and how you phrase rather than standard closed questioning that physios I think preferentially tend to use. You know we've got black and white answers to the questions we're asking"* [Participant 2, Physiotherapist]

For this participant, closed questions help her to maintain control of the consultation. This prevents the discussion from straying into psychosocial matters, which were deemed to be ambiguous and more difficult to address. Doing so serves a practical function, in ensuring that the consultation keeps to time, but also a protective one for the therapist because it pre-empts the need to address what might be emotive issues that they feel less equipped to address.

"So it may be just phrased in a different way rather than having the confidence to let it be a more open discussion. . . They should be equal, [physical and psychosocial issues] that's the problem that we, you know, maybe being physiotherapists you always see it as the physical because that's the way that you are naturally trained" [Participant 2, Physiotherapist]

Theme 3: Implementation issues

In general, these participants viewed MI positively. However, they also expressed some issues regarding its integration within routine clinical practice. The pace of modern healthcare is fast, with many pressures that compete for clinicians' time; a lack of time was felt to be a significant factor that might present a barrier to its use.

"It's quite hard when the focus for us on the medical wards is to get people fit enough to leave the hospital as quick as possible. So it's you know I'm doing this if you like on the back of a lot of what we're you know we're very restricted really on the time that we have for patients." [Participant 3, Physiotherapist]

On the other hand, there was a sense that some additional investment in time (particularly listening) might actually lead to greater levels of overall efficiency in the care that is provided.

". . . you don't have loads of time with patients um and I find that you just tend to go in, give them all the information or whatever and then get out, rather than spending a more time sometimes spending more time with them initially–just an extra 10 minutes means you don't need to spend so much time with them later on." [Participant 9, Physiotherapist].

When participants reflected on what is important from the patients' perspective, taking time to listen and to respond to the patient's needs and priorities was seen to be a worthwhile investment.

". . . the nurses are rushing them to do this, the physios are rushing to do something and everybody is at them and then suddenly there is somebody who has actually got a little bit of time for them and it seems to make a huge difference 'oh you give me so much confidence' and that's really nice for me to hear." [Participant 6, Rehabilitation Assistant]

Clinician participants were keen to impress that they have several different tasks to undertake as part of their role, which may demand different styles of communication. Whilst MI was perceived useful for addressing behaviour change issues, a key to its integration would be the need to switch flexibly between different communication styles, based on the situation. One participant discussed this in the context of an initial consultation prior to pulmonary rehabilitation, involving a combination of instruction, assessment and discussion about helpful behaviour change.

". . .. there is definitely a place for motivation interviewing to discuss certain areas, say about their smoking or about their exercise, but then the other half of the interview we do need to give advice about their medication and when is best to take it and umm what other factors to avoid to make their chest worse, so we have to be kind of clever in the way, I think that we need to incorporate both of those techniques. . ." [Participant 4, Nurse)

Two important considerations expressed were the timing of MI interaction, and the need for a quiet space. This was relevant, particularly on busy wards where the clinicians felt

conscious that the content of what might be discussed would necessitate additional privacy not afforded by the setting.

> *"The pressures of the staffing levels and um the general sort of ambiance on the ward you can often perhaps want to spend some time in quiet with a patient and you have to make a real effort to find both of those—the time and the quiet to do it"* [Participant 3, Physiotherapist]

Theme 4: Training issues

Whilst these participants had experienced some success with their efforts to implement MI, they also acknowledged that it would take time and practice to develop proficiency. One particular challenge was felt to be the use of empathic listening. This is a fundamental skill that involves listening carefully to what the patient is saying, and using reflective listening statements to clarify understanding. Reflections vary in depth with the content of simple reflections staying close to what the patient has stated, whilst more complex reflections capture the underlying meaning (what has been implied but not stated explicitly) [4]. As one might imagine, being able to use complex reflections to differentially evoke and reinforce patient's own motivations for change (a characteristic of more advanced MI practice) is a novel skill which was demanding for these participants.

> *". . . it was just that actually trying, rather than just repeat what the other person is saying, actually trying either paraphrase or emotionally reflect what they are saying, I found really difficult and I think is one of those skills that you really need to practice to improve on really."* [Participant 8, Physiotherapist]

The participants had attended a one-day training in MI, and the consensus was that whilst this was sufficient to create interest and promote enough insight and confidence to try it in practice, additional tailored training with coaching and feedback would be required to promote proficiency.

> *". . . I think the day is enough for you to pick it up and understand what it's about but it's the practice that, improves . . .so having the feedback when you have seen a real patient and applied it would be useful."* [Participant 9, Physiotherapist]

Discussion

Motivational interviewing is a method for resolving the common problem of ambivalence about behaviour change [4]. Although the strongest evidence of effectiveness is in the addictions field, there is considerable interest in applying the same principles to help patients with respiratory problems, for whom effective self-management is known to be of benefit [30]. The results of this study lend support to the feasibility for the use of MI in respiratory care, but raises issues surrounding the desirability for further training, beyond a one-day workshop.

This work is novel in its focus on the feasibility of pure MI rather than a derivative of the pristine method, which is a common feature when attempts are made to apply MI to health contexts. Using adapted forms of MI may be time-efficient in terms of intervention delivery and may reduce training requirements, but runs the risk that intervention 'failure' may be due to a lack of fidelity to the original format, rather than a failure of MI [20]. This study has also provided some preliminary insights into clinicians' views of MI used as an adjunct to pulmonary rehabilitation to enhance engagement and adherence. Identifying ways to extend and prolong the beneficial effects of pulmonary rehabilitation has been identified as a key research

question [31] and studies of interventions to encourage uptake and adherence to PR are now seen as a research priority [32]. One of the strengths of this research is that it involved clinicians from a range of different professional groups, and with different levels of experience of respiratory therapy. To date, most published work applying MI to respiratory contexts has only involved nurses. In the UK, physiotherapists are often the primary point of contact for respiratory patients referred for pulmonary rehabilitation, and are therefore frequently key to encouraging any behaviour change.

The thematic analysis used in this research was primarily inductive, in that the themes were derived mainly from the participant narratives, rather than being aligned to a particular theoretical position. We are aware that prior exposure to MI training and implementation literature will have inevitably influenced our interpretations. As Braun and Clarke note, however, it is not possible for researchers to divorce themselves from pre-existing knowledge [24]. Workshop participants were informed prior to consenting to join the study that the first author (RS) who delivered the MI workshop would also be involved in the analysis of interview data. Those with more negative perceptions of the workshop and of the utility of MI may have been dissuaded from participating to avoid offence or personal embarrassment. Equally, those who elected to participate may have felt inclined to share perceptions that were more complimentary and endorsed the approach. However, neither MD-H nor AB had prior experience of MI, or held any particular views about it

The one-day workshop delivered in this study was designed to introduce the critical elements and theoretical underpinnings of MI, and help participants appreciate how it differs from traditional practice. Another goal was to avoid alienating participants by providing so much detail that they left the workshop confused and/or believing they would never be able to master the skills involved. Whilst it was not the original intention, some attendees were sufficiently motivated and had enough confidence to try out what they had learnt in practice. These participants were encouraged by the responsiveness of their patients and the outcomes they achieved with the approach. However, as participants themselves admitted, a one-day workshop was not sufficient to promote proficiency in the method. This experience is consistent with conclusions from meta-analyses of MI training across other professional groups, that emphasise the importance of additional training in the form of coaching and feedback on practice [33, 34].

It is not yet known how much MI training respiratory clinicians would need in order to develop a level of skill that is capable of making a difference to long-term patient outcomes. The insights gained here have informed the development of a study testing the effect of a tailored training package on MI skill, specifically designed for clinicians delivering pulmonary rehabilitation. There is some evidence from the studies in the addictions field that prior counselling skills (such as accurate empathy, which is foundational to MI) may influence overall MI skill acquisition and retention [35, 36] and a plausible model to explain this observation has been proposed [37]. This means that respiratory clinicians who typically do not have prior training in counselling may find it harder to learn MI than psychologists and specialist counsellors, for whom MI training represents a refocusing of previously attained skills, a point that has been raised by others [5]. For the participants in this study, learning to do MI would involve not only developing a new set of skills, but also de-automating and learning to supress ways of talking with patients that are incompatible with MI. Training would therefore need to focus on both of these issues. Insights gained from this study indicate the importance of teaching respiratory clinicians how to address emotive issues that may emerge during MI, and the need for some flexibility in consultation duration, at least at the outset, while skills are new and relatively inefficient. For these reasons, any future trials of MI should incorporate a cost-benefit analysis that includes the training component for those providing the intervention.

The themes presented here reflect the perceptions of clinicians who were sufficiently interested in MI to attend a workshop and interview, so other clinicians may hold less positive views of the utility of MI. Despite this caveat, we believe our findings should be transferable to many clinicians working in this type of setting.

Conclusion

These findings lend support to the feasibility of using motivational interviewing (MI) in respiratory contexts, such as pulmonary rehabilitation programmes, but highlight potential implementation and training issues for respiratory clinicians who wish to deliver MI effectively. The style of a MI encounter is fundamentally different from traditional approaches to working with patients, but this is not always immediately grasped by those learning it during short training courses. On-going training and additional contact time are necessary to become proficient at the use of MI. These respiratory clinicians viewed MI positively and noted increased patient responsiveness when trying out skills in practice, but also perceived that more training time would be needed to enable them to embed MI within their practice.

Supporting information

S1 Table. (Workshop: Introduction to motivational interviewing in respiratory contexts).
(DOCX)

S1 Text. (Semi-structured interview guide).
(DOCX)

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Q.2 International conference presentation

Shannon RJ, Donovan Hall M and Bruton A (2015) Respiratory clinicians' views of motivational interviewing for enhancing engagement and adherence as part of pulmonary rehabilitation. Paper presented at European Respiratory Society International Congress Amsterdam

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European Respiratory Society
2015 International Congress

Abstract Number: 852111

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Abstract Group: 9.2. Physiotherapists
Keyword 1: Physiotherapy care **Keyword 2:** Rehabilitation **Keyword 3:** Physical activity
PRESENTATION TYPE: Yes, I would prefer to present my abstract, if accepted, as a poster.
You have only applied for the grants and/or sponsorships displayed below:
General Conflicts of Interests: The Presenting Author has no, real or perceived conflicts of interest that relate to this abstract.

Tobacco-Industry related conflict of interests: I have **NO** relationship of any kind with the tobacco industry (since 1/1/2000) nor will have a link to the tobacco industry before the event to which I have been invited by the ERS to participate in

Title: Respiratory clinicians' views of motivational interviewing (MI) for enhancing engagement and adherence as part of pulmonary rehabilitation (PR).

Mr. Robert Shannon, R.J.Shannon@soton.ac.uk[1], Dr. Maggie Donovan-Hall, mh699@soton.ac.uk[1] and Prof. Anne Bruton, ab7@soton.ac.uk[1]. [1]Faculty of Health Sciences, University of Southampton, Southampton, United Kingdom, SO17 1BJ.

Body: Background: MI has been recommended as a potential method for improving outcomes of PR, however there is a paucity of research exploring its feasibility in this context.

Aim: To explore respiratory clinicians' views of MI used as an adjunct to PR. Specifically: Is it useful? Can it be integrated into practice? What training is required?

Methods: Nine respiratory clinicians (3 physiotherapists, 4 nurses, 1 occupational therapist and 1 rehabilitation assistant) attended a 1-day MI workshop and a semi-structured interview 2 weeks later. Interviews were audio-recorded and subjected to thematic analysis.

Results: Three themes were identified: 1) Difference: Most participants felt MI was fundamentally 'different' to their current style of working, with its emphasis on counselling skills and resolving ambivalence. 2) Motivational: They saw potential in using MI to motivate patients. Those who experimented with skills post-workshop were encouraged by patient responsiveness and overall effectiveness. 3) Implementation issues: Participants sensed the complexity of MI would make it difficult to learn and it would take time to become competent. On-going supervision was perceived necessary. Suppressing behaviours that are antithetical to MI was highlighted as a challenge. PR structures would need revising, with additional time made available to enable an appropriate depth of conversation.

Conclusion: These results lend support to the feasibility of MI used as an adjunct to PR, but highlight implementation issues. The insights have informed the development of a study testing the effect of a training package on MI skill for clinicians delivering PR.

Close Window

Health Sciences

Respiratory clinicians' views of motivational interviewing (MI) for enhancing engagement and adherence as part of pulmonary rehabilitation (PR)

R Shannon CPsychol[1], Dr M Donovan-Hall, Professor A Bruton
Faculty of Health Sciences, University of Southampton, Southampton UK [1]R.J.Shannon@soton.ac.uk

UNIVERSITY OF Southampton

Aims

To explore respiratory clinicians' views of MI used as an adjunct to PR. Specifically: Is it useful? Can it be integrated into practice? What training is perceived necessary?

Method

Nine female respiratory clinicians (3 physios, 4 nurses, 1 OT and 1 rehab assistant) attended a 1-day MI workshop and a semi-structured interview 2 weeks later. Interviews were audio-recorded and analysed using thematic analysis.

Results



1.Difference: Though MI draws on some familiar skills, most participants believed MI to be fundamentally 'different' to their current style of working.



Nurse [participant 3]: ...but I found just the whole way of posing the questions and being open and maybe a little bit more um I don't know, non-judgemental about your approach to interviewing with a patient.

2.Motivational: Participants saw potential in using MI to motivate patients. Those who experimented with skills post-workshop were encouraged by patient responsiveness and overall effectiveness.

Physio [participant 5]: ... I worked with a particular patient in a different way and had a very good outcome, umm which I was really - it was really positive and also another person on the course, the other physio, we worked together with this patient in the same way, umm and you could see it did work.





3.Implementation issues: The complexity of MI would make it difficult to learn and it would take time to become competent. On-going supervision was perceived necessary. Suppressing behaviours that are antithetical to MI was highlighted as a challenge as was giving more control to patients during conversations about change. Additional time would be required to enable an appropriate depth of conversation.

Physio [participant 8]: ... rather than just repeat what the other person is saying, actually trying to either paraphrase or emotionally reflect what they are saying, I found really difficult and I think is one of those skills that you really need to practice to improve on really.

Physio [participant 2]: Pretty well the clearest things were how you question patients and how you phrase rather than standard closed questioning that physios I think preferentially tend to use. You know we've got black and white answers to the questions we're asking.

Key Insights

- MI can represent a fundamentally different approach to motivating patients.
- Comprehensive training involving on-going supervision is required.
- Learning to handle emotive issues that may arise during MI is important.
- MI takes time and may require changes to existing programme structures.

Conclusion

These results lend support to the feasibility of MI used as an adjunct to PR, but highlight implementation issues.

Q.3 International conference presentation

Shannon RJ, Bruton A and Donovan Hall M (2015) Learning motivational interviewing for use in pulmonary rehabilitation. Paper presented at European Respiratory Society International Congress Amsterdam

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European Respiratory Society
2015 International Congress

Abstract Number: 852505

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Abstract Group: 9.2. Physiotherapists
Keyword 1: Education **Keyword 2:** Rehabilitation **Keyword 3:** Physical activity
PRESENTATION TYPE: Yes, I would prefer to present my abstract, if accepted, as a poster.
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Title: Learning motivational interviewing (MI) for use in pulmonary rehabilitation (PR).

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Body: Background: MI is a potential method for improving PR engagement and adherence. The quality of MI is known to influence outcomes, but the extent to which PR clinicians can develop skill in this complex counselling method has not been determined.

Aim: To evaluate the impact of a tailored training package on MI skill amongst PR clinicians.

Method: Eleven PR clinicians (7 physiotherapists, 3 nurses, 1 exercise specialist) participated in a 2-day workshop and 5 individualised coaching/feedback sessions scheduled over 10 weeks. MI skill was measured through MI Treatment Integrity coding (MITI 3.1.1) of audio-recorded PR consultations at baseline, post-workshop, post-coaching and at 4 months.

Results: MI skill acquisition was variable. Mean MI skill increased and some aspects surpassed basic competency thresholds at 4 months, but no participants achieved all thresholds simultaneously. Training did not alter the relative frequency and depth of reflective listening sufficiently and some participants struggled to adjust to MI's collaborative, evocative spirit. Observations of patient functioning often did not show the pattern of language that is predictive of change. These results may reflect a 'best-case' scenario, since participants could choose which consultation to record. Mean time to complete training was 18 weeks (±8.26), with service demands commonly cited for the delay.

Conclusion: Prior to widespread adoption of MI as part of PR, it is essential to ensure that those responsible for MI delivery can do so competently. Following the sub-optimal gains in skill observed an updated training package (including the 'PREAMP' manual to guide the integration of MI into PR) is being evaluated.

Close Window

Health Sciences

Learning motivational interviewing (MI) for use in pulmonary rehabilitation (PR)

UNIVERSITY OF Southampton

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Aims

To explore the impact of a tailored training package on MI skill amongst PR clinicians.

Methods

Design: Single group, before and after. ***Participants:*** Eighteen PR clinicians (13 physios, 3 nurses, 1 exercise specialist and 1 physio technician) from 4 NHS Trusts with mean 3.50 (±5.29) hours prior MI training. ***Training Intervention:*** 2-day workshop plus 5 individual coaching/feedback sessions scheduled over 10 weeks. ***Main Outcome:*** MI skill - MI Treatment Integrity coding (MITI 3.1.1: Moyers et al. 2010) of audio-recorded PR consultations at baseline, post-workshop, post-coaching (10 weeks) and a 4-month follow-up.

Results

MI Skill:

Average MI skill increased at each measurement point, but did not reach the minimal level considered sufficient to influence patient outcomes in all areas.

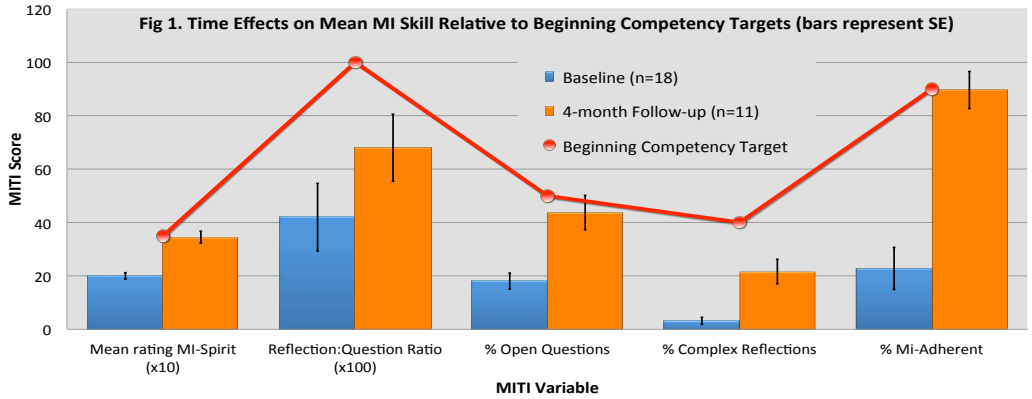
Patient language during recorded PR consultations often did not show the pattern that predicts change with MI.

Training Progression:

Mean time to complete all training components was 18.33 weeks (±10.22), nearly double the planned time with service demands commonly cited for the delay.

Seven participants dropped out at different stages with job changes or sickness given as reasons rather than MI related issues.

Fig 1. Time Effects on Mean MI Skill Relative to Beginning Competency Targets (bars represent SE)



Conclusion

Integrating enough quality MI into PR consultations in which a number of disparate tasks compete for limited contact time is challenging and will likely require more training and support than was afforded in this study. Prior to widespread adoption of MI as part of PR, it is essential to ensure that those responsible for MI delivery can do so competently. Following the sub-optimal gains in skill observed, an updated training package (including the 'PREAMP' manual to guide the integration of MI into PR) is being evaluated.

Key Insights

- MI is a complex clinical method that is difficult to learn.
- Skills improve following training particularly after supervision (individualised coaching and feedback).
- Achieving clinically meaningful levels of MI skill will likely require more than a 2-day workshop and 5 supervision sessions.

Q.4 International conference presentation

Shannon RJ, Bruton A and Donovan-Hall M (2017) Acquiring skills in motivational interviewing to enhance adherence to pulmonary rehabilitation. Paper presented at European Respiratory Society International Congress Milan

09.02 - Physiotherapists

3067
Acquiring skills in motivational interviewing (MI) to enhance adherence to pulmonary rehabilitation (PR).

Physiotherapy care, Rehabilitation, Education

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Background: MI has potential to improve PR engagement and adherence. The integrity of MI delivery is known to influence patient outcomes, but the extent to which PR clinicians can learn to deliver this complex counselling method is unknown.

Aim: To evaluate the impact of a tailored training package on the integrity of MI delivered by PR clinicians.

Method: 24 PR clinicians (16 physiotherapists, 6 nurses, 1 physiotherapy technician, 1 exercise specialist) from 4 NHS organisations participated. MI training involved a 2-day workshop and 5 individualised coaching sessions, with a manual (PREAMP) to guide the integration of MI into PR. MI skill was measured through MI Treatment Integrity coding (MITI 3.1.1) of audio-recorded PR consultations at baseline, post-workshop, post-coaching and at 4 months.

Results: MI integrity increased following training. Mean scores on most MITI components surpassed competency targets at 4-months. No participant achieved all thresholds simultaneously. Training did not alter the relative frequency and depth of reflective listening sufficiently, which may explain why patient language seldom showed patterns predictive of change in MI. Participant drop-out was a problem at each stage, with only 15 clinicians completing all training activities, and 12 contributing to the 4-month follow-up. Service issues rather than negative perceptions of MI were responsible.

Conclusion: Prior to widespread adoption of MI as part of PR, it is essential to ensure that physiotherapists and other clinicians responsible for MI delivery can do so competently. A sub-set of clinicians from this study have been interviewed to identify how training may be optimised.

UNIVERSITY OF Southampton

Acquiring skills in motivational interviewing (MI) to enhance adherence to pulmonary rehabilitation (PR)

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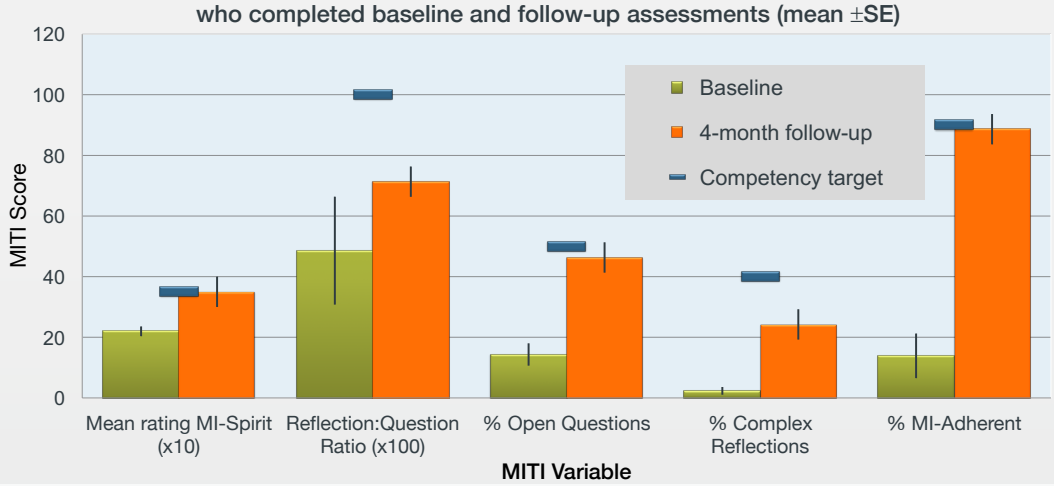
Background: MI has potential to improve PR adherence. The quality of MI delivery is known to influence patient outcomes, but the extent to which PR clinicians can learn to deliver this complex counselling method is unknown.

Aim: To explore the impact of a tailored training package on MI skill amongst PR clinicians.

Methods

Design: Single group, before and after. **Participants:** Twenty four PR clinicians (16 physios, 6 nurses, 1 exercise specialist and 1 physio technician) from 4 NHS Trusts. **Training Intervention:** 2-day workshop plus 5 individual coaching/feedback sessions scheduled over 10 weeks with a manual to guide integration of MI. **Main Outcome:** MI skill - MI Treatment Integrity coding (MITI 3.1.1: Moyers et al. 2010) of audio-recorded PR consultations at baseline, post-workshop, post-coaching (10 weeks) and a 4-month follow-up.

Time Effects on MI Skill Relative to Competency Targets for the 12 participants who completed baseline and follow-up assessments (mean ±SE)



Results

MI Skill: Skill increased at each measurement point. At 4-months, the number of participants achieving the competency target on each element of the MITI (the minimal level considered sufficient to influence patient outcomes) were as follows: MI spirit 8/12; reflection:question ratio 2/12, % open questions 6/12; % complex reflections 3/12; % MI-adherent 9/12. None of the participants achieved all thresholds simultaneously. Training did not alter the relative frequency and depth of reflective listening enough to reach competency targets.
Training Progression: Participant drop-out was a problem at each stage, with only 15/24 clinicians completing all training activities, and 12/24 contributing to the 4-month follow-up. Service issues rather than negative perceptions of MI were responsible.

Key Insights

- MI is a complex clinical method that is difficult to learn.
- Skills improve following training particularly after supervision (individualised coaching and feedback).
- Not all clinicians involved were able to achieve clinically meaningful levels of MI skill after a 2-day workshop and 5 supervision sessions.
- Service demands and programme structures influence clinicians' ability to complete training activities and integrate MI into practice.

Q.5 International conference presentation

Shannon RJ, Summers R, Bruton A and Donovan-Hall M (2017) The challenge of learning motivational interviewing for pulmonary rehabilitation: clinician perspectives. Paper presented at European Respiratory Society International Congress Milan

09.02 - Physiotherapists

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The challenge of learning motivational interviewing (MI) for pulmonary rehabilitation (PR): clinician perspectives.

Physiotherapy care, Rehabilitation, Education

R. Shannon[1], **R. Summers**[1], **A. Bruton**[1], **M. Donovan-Hall**[1]

[1]**University of Southampton - Southampton (United Kingdom)**

Background: MI is a potential method for enhancing adherence to PR. We observed variable skill acquisition amongst PR clinicians following intensive MI training. This study provides insights into their challenges.

Aim: To explore PR clinicians' experiences whilst learning and implementing MI.

Method: Nine PR clinicians (7 physiotherapists, 1 physiotherapy technician, 1 nurse) completed a 2-day workshop and on-going supervision. Each undertook a semi-structured follow-up interview that was audio-recorded, transcribed verbatim and analysed with framework analysis.

Results: Five themes were identified: 1) Burden: Participants described a high level of psychological effort involved in using MI. Trying novel skills and suppressing behaviours that are antithetical to MI demands much attentional resource and detracted from other key tasks such as maintaining empathy. 2) Destabilising: Recognising the limitations of existing practice, yet feeling underprepared to deliver MI effectively was stressful for some and led to performance anxiety. 3) Committing to uncertainty: Using MI required participants to accept sessions may take longer, cover unanticipated topics and may not result in change. 4) Difficult feelings: concern that MI may reveal emotive issues that are uncomfortable for patients and clinicians. 5) Additional support: Training was viewed positively, but more supervision was perceived necessary. Extending consultations would help integration efforts particularly while skills are novel and inefficient.

Conclusion: MI is a complex method that is challenging to do well. These findings have been used to optimise training to promote higher skill levels in a future study.

UNIVERSITY OF Southampton

The challenge of learning motivational interviewing (MI) for pulmonary rehabilitation (PR): clinician perspectives

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Background: MI is a potential method for enhancing adherence to PR. We observed variable skill acquisition amongst PR clinicians following intensive MI training.

Aim: To explore PR clinicians' experiences whilst learning and implementing MI.

Methods: Nine PR clinicians (7 physiotherapists, 1 physiotherapy technician, 1 nurse) completed a 2-day workshop and on-going supervision. Each undertook a semi-structured follow-up interview that was audio recorded, transcribed verbatim and analysed with framework analysis.

Results

Burden

- The psychological effort involved in using MI for the novice. During MI, participants focused their attention on what they should say but often struggled to simultaneously listen to, and be responsive to the patient.

[Participant 4] *… I don't think I'm always listening as well as I should do … because I'm panicking about what I should be saying next, to get it right …*

Destabilising

- Recognising the limitations of existing practice, yet feeling underprepared to deliver MI effectively was stressful for some and led to performance anxiety.

[Participant 8] *… it's something that you assume that you're good at - listening and motivating and doing all those things so you're – it's a bit of a – 'Oh right okay, I'm not actually doing – I'm not actually doing that'.*

Committing to uncertainty

- Using MI required participants to accept sessions may take longer, cover unanticipated topics and may not result in change.

[Participant 7] *… but it can be more difficult to handle, and control …*
[Participant 6] *It's actually to do with changing beliefs and giving people options and people have got choices when you kind of think oh, those choices are just so rubbish.*
[Participant 9] *… you get upset because you're giving them all your advice and they're not listening and you think 'If they don't do it then I've failed as a practitioner'.*

Difficult feelings

- Concern that MI may reveal emotive issues that are uncomfortable for patients and clinicians.

[Participant 2] *… they do open up to me and tell me things which sometimes might surprise me or like make me feel a bit sad …I start feeling quite sympathetic...*

Additional support

- Training was viewed positively, but more supervision was perceived necessary. Extending consultations would help integration efforts particularly while skills are novel and inefficient.

[Participant 3] *Yeh, the more* [coaching and feedback] *you could get the better…*
[Participant 7] *So I would say at my level at the moment, if I had an hour to just do that conversation and get the commitment then I'd need to invite them back to actually do the assessment.*

Key Insights

- All participants viewed MI positively but accepted that it is a complex method that is difficult to learn.
- The underpinning style of working and the skills involved differ from everyday practice.
- Practicing MI involves shifts in attitudes, beliefs and assumptions about the determinants of behaviour change, which take time and effort to achieve.
- Participants wanted more coaching and feedback and perceived this would be helpful in building their MI competence and confidence.

Glossary of terms[43]

Ability: A form of client *preparatory change talk* that reflects a perceived personal capability of making a change: typical words include *can*, *could*, and *able*.

Absolute worth: One of four aspects of acceptance as a component of *MI spirit*, prizing the inherent value and potential of every human being.

Acceptability: Whether recipients and providers view an intervention as appropriate and relevant for addressing a clinical problem or issue (Giangregregorio and Thabane 2015). Subsumed under the term *feasibility* within the Medical Research Council framework for designing and evaluating complex interventions (Craig et al. 2008).

Acceptance: One of four central components of the underlying *spirit* of *MI*, by which the clinician communicates *absolute worth, accurate empathy, affirmation* and *autonomy support.*

Accurate empathy: The skill of perceiving and reflecting back another person's meaning: one of four aspects of *acceptance* as a component of the *MI spirit*.

Activation language: A form of client *mobilising change talk* that expresses disposition toward action but falls short of *commitment language*; typical words include *ready*, *willing*, *considering*.

Affirmation: One of four aspects of acceptance as a component of *MI spirit*, by which the clinician accentuates the positive, seeking and acknowledging the client's strengths and efforts.

Agenda mapping: A short *focusing* metaconversation in which the clinician steps back with the client to choose a *direction* from among several options.

Airflow limitation: Inflammation and narrowing of airways leads to decreased ability to exhale (FEV_1). Destruction of cells in the lings contributes to airflow limitation through a reduction in elastic recoil, as does accumulation of mucous and inflammatory cells in the airways. *Dynamic hyperinflation* also contributes to airflow limitation and is a

[43] Motivational interviewing focused definitions within this section are direct quotes from the glossary within Miller, W.R. & Rollnick, S. (2013) Motivational Interviewing, 3rd Edition. New York: Guilford Press. pp. 405-414 (Appendix A).

major reason for exercise intolerance in patients with Chronic Obstructive Pulmonary Disease (GOLD 2020).

Ambivalence: The simultaneous presence of competing motivations for and against change.

Autonomy support: One of four central components of the underlying *spirit* of *MI*, by which the clinician accepts and confirms the client's irrevocable right to self-determination and choice.

Basic competency in motivational interviewing: The level of skill considered sufficient to impact patient outcomes. Based on expert opinion rather than derived empirically.

Change goal: A specific target for change in *MI*, typically a behaviour change although it may also be a broader goal towards which there are multiple avenues of approach.

Change plan: A specific scheme to implement a change goal.

Change talk: Any client speech that favours movement towards a particular change goal.

Client-centred counselling: A therapeutic approach introduced by psychologist Carl Rogers in which clients explore their own experience within a supportive, empathic and accepting relationship.

Closed question: A question that asks for yes/no, a short answer or specific information.

Collaboration: One of four central components of the underlying *spirit* of *MI*, by which the clinician functions as a partner or companion, collaborating with the client's own expertise.

Commitment language: A form of client *mobilising change talk* that reflects intention or disposition to carry out change: common verbs include *will*, *do*, *going to*.

Compassion: One of four central components of the underlying *spirit* of MI, by which the clinician acts benevolently to promote a client's welfare, giving priority to the client's needs.

Complex reflection: A clinician reflection that adds additional or different meaning beyond what the client has said; a guess as to what the client may have meant.

Confront: 1) as a goal: to come face to face with one's current situation and experience; 2) as a practice: an *MI non-adherent/inconsistent* clinician response such as warning, disagreeing, or arguing.

Chronic Obstructive Pulmonary Disease: Defined by *GOLD* as a lung disease characterised by chronic obstruction of lung airflow that interferes with normal breathing and is not fully reversible. The previously used terms '*chronic bronchitis*' and '*emphysema*' are now included within the COPD diagnosis. Either may be present, but it is difficult to determine the relative involvement of each to the disease process (GOLD 2020).

Depth of reflection: The extent to which a reflection contains more than the literal content of what the client has already said. See also *complex reflection*.

Desire: A form of client *preparatory change talk* that reflects a preference for change: typical verbs include *want*, *wish*, and *like*.

Directing: A natural communication style that involves telling, leading, providing advice, information or instruction.

Direction: The extent to which a clinician maintains in-session momentum toward a change goal.

Discord: Interpersonal behaviour that reflects dissonance in the working relationship; *sustain talk* does not in itself constitute *discord*; examples include arguing, interrupting, discounting, or ignoring.

Discrepancy: The distance between the *status quo* and one or more client *change goals.*

Dynamic hyperinflation: Volume of air in the lungs remains elevated on exhalation because of airflow limitation and reduced elastic recoil of the alveoli.

Dyspnoea: A complex symptom of *COPD*; the subjective experience of shortness of breath that can be distressing and may lead to activity avoidance (Rabe 2006).

Empathy: The extent to which a clinician communicates accurate understanding of the client's perspectives and experience; most commonly manifested as *reflection.*

Engaging: The first of four fundamental processes in *MI*, the process of establishing a mutually trusting and respectful helping relationship.

Evocation: One of four central components of the underlying *spirit* of *MI*, by which the clinician elicits the client's own perspectives and motivation.

Evoking: The third of four fundamental processes in *MI*, which involves eliciting the client's own motivation for a particular change.

Exercise: '. . . a subset of physical activity that is planned, structured, and repetitive and has a final or immediate objective the improvement or maintenance of physical fitness' (Caspersen et al. 1985 p126).

Exercise intolerance: A symptom whereby a person is either unable to participate in physical activity and/or exercise at an intensity or for a duration that would be expected, or experiences undue fatigue or other negative effects. A feature of COPD (GOLD 2020).

Expert trap: The clinical error of assuming and communicating that the clinician has the best answers to the client's problems.

Feasibility: The extent to which an intervention can be delivered as planned. Described within the Medical Research Council framework as one of four key elements in the process of developing and evaluating complex interventions (Craig et al. 2008).

Forced expiratory volume in one second: The maximum volume of air that can be exhaled in one second. Used as a measure of airways obstruction in COPD (GOLD 2020).

Focusing: The second of four fundamental processes in *MI*, which involves clarifying a particular goal or direction for change.

Following: A natural communication style that involves listening to and following along with the client's own material without the clinician inserting their own material.

Hypoxaemia: Low levels of oxygen within the blood.

Mobilising change talk: A subtype of client change talk that expresses or implies action to change; examples are *commitment*, *activation language*, and *taking steps*.

Motivational interviewing: a collaborative, goal-oriented style of communication with particular attention to the language of change, designed to strengthen personal motivation for and commitment to a specific goal by eliciting and exploring the person's own reasons for change within an atmosphere of acceptance and compassion.

Motivational Interviewing Skill Code: Introduced by Miller and Mount (2001) as the first system for coding client and clinician utterances within *MI*.

Motivational Interviewing Treatment Integrity coding system: Simplified from the *MISC* and focusing only on clinician utterances, to document integrity in MI delivery.

Need: A form of client *preparatory change talk* that expresses an imperative for change without specifying a particular reason. Common verbs include *need*, *have to*, *got to,* and *must*.

Open question: A question that offers the client broad latitude and choice in how to respond; compare with *closed question.*

Percent open-ended questions: The percentage of total clinician questions that are open-ended. Calculated by dividing the number of open-ended questions by the total number of questions (open-ended and closed), divided by 100. A component of *MI* skill.

Percent complex reflections: The percentage of total clinician reflections that are complex. Calculated by dividing the number of complex reflections by the total number of reflections (simple and complex), divided by 100. A component of *MI* skill.

Percent MI-adherent: The percentage of clinician responses that are consistent with the spirit and skills used in MI. Calculated by dividing the number of MI-adherent responses, by total responses (MI-adherent and MI-non-adherent), divided by 100. Used as a *MITI* summary score; see also *Percent MI-consistent*. A component of *MI* skill.

Percent MI-consistent: The percentage of clinician responses that are consistent with the spirit and skills used in MI. Calculated by dividing the number of MI-consistent responses, by total responses (MI-consistent and MI-inconsistent), divided by 100. Used as a *MISC* summary score; see also *Percent MI-consistent*. A component of *MI* skill.

Physical activity: '. . . any bodily movement produced by skeletal muscles that results in energy expenditure.' (Caspersen et. al. 1985 p. 126) and includes leisure time, domestic and occupational activities.

Physical inactivity: A level of physical activity that is below recommended levels (World Health Organisation 2010).

Planning: A fourth fundamental process in *MI*, which involves developing a specific change plan clarifying a particular goal or direction for change.

Preparatory change talk: A sub-type of client *change talk* that expresses motivations for change without stating or implying specific intent or commitment to do it: examples are *desire*, *ability*, *reason*, and *need*.

Proficiency in motivational interviewing: The level of skill identified within practice samples provided by 'experts' in motivational interviewing.

Pulmonary rehabilitation: '. . . a comprehensive intervention based on a thorough patient assessment followed by patient tailored therapies, which include, but are not limited to, exercise training education, and behaviour change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence of health enhancing behaviours.' (Spruit 2013b e16).

Reason: A form of client *preparatory change talk* that describes a specific if-then motivation for change.

Reflective listening: The skill of 'active listening' whereby the clinician seeks to understand the client's subjective experience, offering *reflections* as guesses about the client's meaning. See also *accurate empathy.*

Reflection question ratio: The ratio of reflective listening statements (simple and complex) to questions (open-ended and closed). A component of *MI* skill.

Resistance: A term previously used in MI, now deconstructed into its components *sustain talk* and *discord.*

Self actualization: The pursuit and realisation of one's core values – becoming what one is meant to be (Rogers 1961).

Scoping review: A review that "provides a preliminary assessment of the potential size and scope of available research literature. It aims to identify the nature and extent of research evidence." (Grant and Booth 2009 p. 101).

Simple reflection: A reflection that contains little, or no additional content beyond what the client has said.

Spirit: The underlying set of mind and heart within which MI is practiced, including collaboration, acceptance, compassion and evocation.

Spirometry: A test of pulmonary function.

Summary: A reflection that draws together content from two or more client statements.

Sustain talk: Any client speech that favours the *status quo* rather than movement toward a *change goal.*

Tachypnoea: Rapid breathing.

Taking steps: A form of client *mobilising change talk* that describes an action or step already taken toward change.

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