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UNIVERSITY OF SOUTHAMPTON

FACULTY OF SOCIAL AND HUMAN SCIENCES

Academic Unit of Psychology

**Modifying and Evaluating the Feasibility of a Web-based
Weight Loss Intervention for Royal Navy Personnel**

by

Gülcan Garip

Thesis for the degree of Doctor of Philosophy in Health Psychology
Research and Professional Practice

August 2013

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ABSTRACT

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MODIFYING AND EVALUATING THE FEASIBILITY OF A WEB-BASED WEIGHT LOSS INTERVENTION FOR ROYAL NAVY PERSONNEL

By Gülcan Garip

A range of resources exist to support overweight and obese personnel with their weight management efforts in the Royal Navy (RN). However, the high prevalence of personnel with excess weight in the RN suggests that these resources may be insufficient. Web-based weight loss interventions may be particularly well-suited for addressing the problem of overweight and obesity in the RN, as they may provide flexible and easily accessible support that can be accessed in users' own time.

This thesis presents an evaluation of the first web-based weight loss intervention for overweight and obese RN personnel. A systematic review and meta-synthesis of 17 studies was conducted to explore overweight and obese adults' perceptions and experiences of behavioural weight management interventions. The review indicated several factors that overweight and obese people perceived as affecting their weight management efforts, which if addressed, could improve the credibility of weight management interventions. A survey study with 1030 RN personnel identified there was some interest in using a web-based weight loss intervention in the RN, particularly among obese personnel and female personnel. A qualitative study with 21 overweight and obese RN personnel identified participants' perceived barriers and facilitators within the Naval environment that were related to their weight management efforts. These findings were used to inform modifications to an existing web-based weight loss intervention. A second qualitative study explored 14 overweight and obese personnel's perceptions and experiences of using the modified web-based weight loss intervention. Further modifications to the intervention were undertaken in light of the results from this study. A final feasibility study aimed to evaluate the possibility of trialling and implementing the modified web-based weight loss intervention among 43 overweight and obese RN personnel according to the *Reach, Efficacy, Adoption, Implementation and Maintenance* (RE-AIM) framework. It was estimated that the uptake of the intervention was 6% and it had a moderate effect on weight loss among users, despite not being implemented as intended.

This thesis identified a number of suggestions for improving overweight and obese RN personnel's engagement with web-based weight management interventions. These include the need for interventions to promote autonomous motivation among overweight and obese personnel to manage their weight, and interventions at the organisational level to change perceptions around weight management in the RN.

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DECLARATION OF AUTHORSHIP

I, Gülcan Garip, declare that the thesis entitled “Modifying and Evaluating the Feasibility of a Web-based Weight Loss Intervention for Royal Navy Personnel” and the work presented in the thesis are both my own, and have been generated by me as a result of my own original research.

I confirm that:

- This work was done wholly while in candidature for a research degree at this University;
- 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;
- Where I have consulted the published work of others, this is always clearly attributed;
- 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;
- I have acknowledged all main sources of help;
- 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;
- Parts of this work have been published as:

Garip, G. & Yardley, L. (2011). A synthesis of qualitative research on overweight and obese people’s views and experiences of weight management. *Clinical Obesity*, 1(2-3), 110-126.

Garip, G., Brasher, K., Bridger, R. & Yardley, L. (*in press*). Weight management experiences of overweight and obese Royal Navy personnel. *Military Behavioural Health*.

- Parts of this work have been published as the Institute of Naval Medicine reports:

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Brasher, K., Garip, G., Bennett, A., Day, A. & Bridger, R. (2011). Body mass, weight loss and psychological strain in the RN. INM Report No. 2011.048.

Signed:

Date:.....

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Abbreviations

BMI	Body Mass Index
CASP	Critical Appraisal Skills Programme
DNPD	Department of Naval Physical Development
GG	Gülcan Garip
INM	Institute of Naval Medicine
LY	Lucy Yardley
MoD	Ministry of Defence
MoDREC	Ministry of Defence Research Ethics Committee
NICE	National Institute for Health Care Excellence
PBC	Perceived behavioural control
POWeR	Positive Online Weight Reduction
POWeR-RN	Positive Online Weight Reduction Royal Navy
RE-AIM	Reach, Efficacy, Adoption, Implementation & Maintenance
RN	Royal Navy
RNFT	Royal Navy Fitness Test
SCT	Social Cognitive Theory
SDT	Self-Determination Theory
TA	Think aloud
T	Telephone
TPB	Theory of Planned Behaviour
TSRQ	Treatment Self Regulation Questionnaire
UK	United Kingdom
UoS	University of Southampton

1. Introduction, Methodological Issues and Thesis Outline

1.1 Chapter overview

This thesis presents a programme of applied health research that was conducted to investigate the feasibility of implementing a web-based weight loss intervention in the Royal Navy (RN). Health psychology may be particularly useful for developing and identifying feasible interventions for supporting overweight and obese personnel to achieve and maintain a healthy weight in the RN. The chapter will introduce the context within which the research was conducted, followed by a description of the current status of the problem of overweight and obesity in the RN and the existing sources of support for weight management in the RN. A brief overview of the recent literature on the effectiveness of web-based weight loss interventions is then presented. The chapter also describes some of the epistemological (theory of knowledge) and methodological considerations relevant to mixed methods research and the empirical work that was conducted. Lastly, the chapter ends with an outline of the empirical chapters and a rationale for the research undertaken in this thesis.

1.2 The Royal Navy

1.2.1 The research context

The Royal Navy (RN) is a branch of the British Armed Forces and is concerned with the protection of British interests. As of January 2013, the RN has reported consisting of 31,810 regular personnel (excluding volunteers), with a considerably higher ratio of men (91%) to women (9%) which is common across all branches of the military (UK National Statistics, 2013). The research programme reported in this thesis was tasked by the RN's Department of Naval Physical Development (DNPD) as a collaborative project between the University of Southampton (UoS) and the Institute of Naval Medicine (INM) as high rates of

overweight and obese personnel were identified in the RN (Bridger, Bennett, & Brasher, 2011; Kilminster, De Sa, & Bridger, 2008).

This research project was conducted in RN personnel's workplaces, i.e. in various shore-based Navy bases in the Portsmouth and Yeovil areas in the UK. The majority of participants were junior personnel (ratings) who also lived in RN accommodation halls (cabins and dorms) at the bases where they were working and undergoing training. Ratings went to their civilian homes during the weekends and holidays. Some participants of higher ranks (officers) who lived close to the base they worked at lived in their civilian homes. Upon completing their training at a particular base, ratings were often relocated to ships or other bases for more permanent positions. All personnel could be drafted for deployment at any time, medical status permitting.

The researcher had the opportunity to visit a type-45 ship (HMS DAUNTLESS) in order to get a better understanding of the constraints of personnel's life on ships and to assess whether it would be feasible to implement the weight loss website on ships. Ultimately it was decided that due to limited internet accessibility on ships, ships were not included within this programme of research. The physical training instructor who gave the researcher the tour of the ship highlighted the shift in many tasks that were historically carried out manually, that had now become mechanical due to technological developments. The change in many manual tasks becoming mechanised has resulted in roles that are mainly sedentary for RN personnel. Therefore, some personnel that would have had physically demanding positions are nowadays likely to have sedentary roles. This change in the nature of RN personnel's duties may also have influenced weight problems in the RN.

1.2.2 The problem of overweight and obese Royal Navy personnel

Obesity and overweight have been defined as an excess accumulation of fat that may impair one's health (World Health Organisation, 2010). In this section, background information on current rates of overweight and obese personnel, the impact of excess weight on personnel's wellbeing and the implications for the operational capability of the RN will be presented. Overweight and obesity

are linked with hypertension, Type 2 diabetes (Ford, Williamson, & Liu, 1997) and coronary heart disease (Klein et al., 2004), as well as increased knee and back injury risk, and musculoskeletal disorders (Toivanen et al., 2010). There is some evidence to suggest that obese people who take regular exercise are partially protected against health conditions such as heart disease (Manson et al., 1999), and all-cause mortality (Paffenbarger Jr, Hyde, Wing, & Hsieh, 1986). Excess weight is a strong predictor of knee and joint injuries, which are the most common reason for lost man days at work within the military (Wallace et al., 2006). Burton and colleagues (1998) found that, in the workplace, personnel with BMIs higher than 27 had higher costs of employment directly and indirectly due to additional health risks, short-term disability, sickness absence and higher overall healthcare costs. In the RN, excess weight may be related to a higher risk of being medically downgraded (Kilminster et al., 2008) and to diminished self-reported ability to work (Bennett & Bridger, 2010), which has implications for the operational capability of the RN. Obesity is associated with the development of knee and back disorders which are the most frequently cited reasons for being medically downgraded in the RN (Bridger, 2008). Overweight and obesity-related health problems result in considerable financial costs for the RN in lost man days at work, medical discharges, and rehabilitation (Armed Forces Weight Management Policy, 2009).

A crude measure of establishing one's weight status is by calculating their Body Mass Index (BMI), which can be done by dividing an individual's body weight (kg) by the square of their height (m²) (Noël & Pugh, 2002). A more appropriate measure for RN personnel's weight status may also include their waist circumference measurements, in accordance with the NICE guidelines (National Institute for Health and Clinical Excellence (NICE), 2006). This categorisation is more appropriate for physically active RN personnel as this method is able to distinguish between people whose BMI is high due to muscle mass versus fat.

A survey that aimed to identify the prevalence rates of obesity in the RN found that in a stratified (gender and rank) random sample of 1596 personnel, 13% were obese and 42% were overweight based on their body mass index (BMI) (Kilminster et al., 2008). In a later stage of this longitudinal survey, self-reported height, weight and waist circumference measurements were collected

and it was found that 28% of the sample fell into the increased health risk zone according to the NICE guidelines (Bridger et al., 2011). A more recent study calculated the 'at risk' prevalence using the NICE guidelines and based on objective measurements of BMI and waist circumference, found that 30% of male and female RN personnel fell into the at risk categories (Shaw, Simpson, Davey, & Fallowfield, 2013). In the general population in England, prevalence rates of overweight and obesity have been reported as 62.8% (National Obesity Observatory, 2010). There is some evidence to indicate that an increasingly larger proportion of younger personnel in the RN are obese, which may be explained by the high prevalence rates in obesity in the general population (Bennett et al., 2011). These findings resulted in the RN's Department of Naval Physical Development (DNPD) tasking the Institute of Naval Medicine (INM) to collaborate with the University of Southampton (UoS) in order to develop a cost-effective way for supporting overweight and obese RN personnel in their efforts to manage their weight.

This is the first programme of research to explore overweight and obese RN personnel's experiences and perceptions of weight management in the RN. In this thesis, the psychological and social factors that may influence weight management and decisions to engage with a behavioural weight loss intervention are explored. It is important to understand what may hinder personnel from making healthier dietary choices, taking advantage of the facilities for increasing levels of physical activity and seeking support for weight management. In identifying these barriers it may be possible for health researchers and health professionals to develop or modify existing interventions that may support personnel in overcoming some of the barriers they perceive.

1.2.3 Existing sources of weight management support in the Royal Navy

There are many resources and facilities available to RN personnel for maintaining high levels of physical activity, perhaps more so than the opportunities that may be available to people in the general population. Despite the various sources of weight management support available to RN

personnel, some personnel struggle with excess weight. Every base and a majority of the ships have gyms, and physical training instructors organise sports sessions at least once a week for personnel. All personnel are entitled to an hour each week during their working hours to exercise. Most bases nowadays run Healthy Lifestyle Clubs, which are weekly one hour sessions that are led by physical training instructors that aim to bring together overweight and obese personnel to take part in organised exercise. At HMS SULTAN, these sessions were compulsory for obese personnel and for personnel who failed their fitness test. Some of the larger bases have well maintained sports grounds for various team sports including, rugby, football, and cricket.

In the RN, physical fitness is necessary and highly valued as it has implications for personnel carrying out their operational roles. Since 2004 it is compulsory for all personnel to undergo an annual RN fitness test (RNFT), which aims to ensure that personnel maintain minimum levels of physical fitness to carry out their operational roles. The RNFT consists of various activities that need to be completed within a certain time frame which depends on one's age, gender and medical status. Personnel who fail the RNFT are placed on one of three remedial packages that aim to increase personnel's fitness levels before they re-take the RNFT. The remedial package one is put on depends on the extent of how badly they fail the RNFT. Personnel following the RNFT work closely with physical training instructors, who monitor their progress. Personnel who fail the RNFT three times are referred to medical staff at INM, who liaises with the personnel about the underlying reasons for failing the RNFT. At this stage, the personnel's case is reviewed and an executive decision about their career in the Naval Services is made by the personnel's chief officer.

Some information about the importance of nutrition is provided in dining areas and on notice boards in the sports centres but compared to the emphasis placed on physical fitness, information about making healthier dietary choices is not as prominent.

1.3 Web-based weight loss interventions

In this thesis the feasibility of implementing a web-based weight loss intervention for overweight and obese RN personnel is explored. The RN, as in most military settings, consists predominantly of male personnel, which creates an opportunity for conducting research that may help to remedy the underrepresentation of men in weight loss research (Young, Morgan, Plotnikoff, Callister, & Collins, 2012). Engaging men in weight loss interventions has traditionally been quite difficult, as men tend to perceive these interventions as a more feminine approach for managing one's weight (Morgan, Warren, Lubans, Collins, & Callister, 2011). Web-based weight loss interventions may be particularly well-suited for men as it has been suggested that men tend to prefer interventions for weight loss that they can access in their own time, that are convenient and do not require face-to-face contact (French, Jeffery, & Wing, 1994; Sabinsky, Toft, Raben, & Holm, 2007).

Web-based health behaviour interventions are delivered to end-users over the Internet and may aim to prevent the development, or to self-manage the treatment of existing chronic health conditions (e.g. diabetes, eczema, obesity) as well as to promote campaigns for the adoption of health behaviours (e.g. healthy eating, smoking cessation) (Glasgow, Vogt, & Boles, 1999). Web-based interventions are generally followed independently by users and can differ in terms of the number and type of behaviour change techniques adopted and the extent of human support involved in the intervention.

In a review of the reasons for delivering health interventions over the Internet, it was found that web-based interventions provided timely information and reduced costs for users and health services, reduced stigma, and increased user and provider control over the intervention (Griffiths, Lindenmeyer, Powell, Lowe, & Thorogood, 2006). On the other hand, web-based health interventions may lack human contact, require technological expertise and may reinforce stigma around sensitive topics (e.g. weight loss). Systematic reviews that have investigated the efficacy of web-based weight loss interventions reported that the user profiles of weight loss websites were unknown, and the efficacy of web-based weight loss interventions was unclear (Neve, Morgan, Jones, & Collins, 2010; Saperstein, Atkinson, & Gold, 2007).

There is growing evidence to suggest that web-based weight loss interventions are perceived by users and intervention providers as flexible, easily accessible, and user-friendly for supporting overweight and obese people in the general population (Arem & Irwin, 2010; Hansen et al., 2012; Morgan et al., 2013) and in workplaces (Morgan, Collins, et al., 2011; Morgan, Lubans, Collins, Warren, & Callister, 2012; Patrick et al., 2011). The workplace may be particularly well-suited for implementing a web-based weight loss intervention since personnel spend a significant amount of time at the RN bases and they may be able to draw on social support from their colleagues. Systematic reviews of weight loss interventions in the workplace identified a need for studies with stronger methodologies, and found problems with recruitment and retention (Benedict & Arterburn, 2008; Mhurchu, Aston, & Jebb, 2010).

One randomised controlled trial evaluated the feasibility and efficacy of a workplace-based weight loss intervention for male shift workers (Morgan, Collins, et al., 2011). The intervention lasted three-months and involved one information session, programme booklets, group-based financial incentives and an online component. Participants' anthropometric measures (including weight, waist circumference, and height) were taken at baseline and at 14-weeks. It was found that the intervention was feasible and efficacious, resulting in significant weight loss and improved health-related outcomes and behaviours in overweight male shift workers. It was unclear to what extent individual components of the intervention may have contributed to achieving the desired outcomes. Unlike in the RN, it is likely that this intervention would have been the main source of support participants would have received for losing weight.

In another study it was found that among male staff and students, clinically significant weight loss was maintained after 1-year follow-up in an intervention that included one information session, programme booklets and a weight loss website (Morgan et al., 2012). The authors refer to this intervention as a 'low-dose intervention programme' to indicate the low resources and costs associated with delivering this intervention. If effective, low-dose web-based weight loss interventions can be easily implemented in workplaces where people may struggle with excess weight.

An existing low-dose web-based weight loss intervention, called Positive Online Weight Reduction (POWeR), was modified for the RN context (chapter 6). The implementation of the modified POWeR intervention may serve as an additional tool for weight management for overweight and obese RN personnel that could be used in conjunction with existing weight management support in the RN.

1.4 Epistemological and Methodological issues

1.4.1 Philosophical stance

Different paradigms are associated with qualitative and quantitative research methods. Quantitative research is generally associated with a positivist perspective, which aims to establish objective truths and generalisable findings by evaluating operationalised variables using standard measures that have been found to be reliable and validated (Denzin & Lincoln, 2011). Where possible, experimental procedures are applied to randomised representative samples in an attempt to minimise or remove confounding variables. Qualitative research is generally associated with a constructivist perspective, which challenges the possibility of objective knowledge (Denzin & Lincoln, 2011). According to this tradition, our understanding and interpretation of reality is formulated by our subjective, social and cultural experiences.

The philosophical stance adopted in the qualitative and quantitative studies presented in this thesis is a critical realist approach. In the interest of clarity, it is worth considering the assumptions of critical realism with regards to ontological (the nature of being or existence), epistemological (theories of knowledge that describe existence), and methodological (research approaches that structure and rationalise epistemic concepts for investigative purposes) concepts (Lipscomb, 2008). Critical realism posits that there are many levels of objective (observable and measurable) and subjective (interpretative and constructed) truths that are structured, differentiated, stratified and changing (Bhaskar, 2008). According to the critical realist perspective, knowledge of reality is mediated through people's perceptions of and beliefs about reality (Barnett-Page & Thomas, 2009). A critical realist approach assumes that the perceptions people report are representative of a truth they experience in a particular context, at a particular point in time. To some extent, critical realism

overlaps with the social constructionist viewpoint in that although the existence of an external world independent of human consciousness is assumed, at the same time there is an acceptance that our knowledge about reality is socially determined (Danermark, 2001).

1.4.2 Mixed methods

In recent years, there has been a rise in research that uses both qualitative and quantitative methods, which is generally referred to as 'mixed methods', 'multiple methods' or 'multi-method' (Östlund, Kidd, Wengström, & Rowa-Dewar, 2011; Tashakkori & Teddlie, 2010). While it may be easy to identify mixed methods research, there may be much diversity in what authors mean by 'quantitative' and 'qualitative', and at what stage of the research process the two methods are mixed (Small, 2011). There are three qualitative and two quantitative studies presented in this thesis. The decision to use either qualitative or quantitative research methods was based on the aims of the studies. In chapter 2, a systematic review and synthesis of the qualitative literature on overweight and obese people's perceptions of behavioural weight management interventions was conducted to derive a more comprehensive understanding of people's unsuccessful and successful weight management experiences. Chapter 3 presents a survey study that aimed to explore whether there was interest among overweight and obese RN personnel to use a web-based weight loss intervention. In order to learn more about overweight and obese RN personnel's views and experiences of weight management and the web-based weight loss intervention semi-structured interviews (chapter 4) and think-aloud interviews (chapter 5) were conducted. Chapter 6 brings together the findings from the preceding chapters and describes how each study contributed to the modification of the existing web-based weight loss intervention, for use in the RN context. The second quantitative study is presented in chapter 7, which aimed to evaluate the feasibility of implementing the modified web-based weight loss intervention for overweight and obese RN personnel. The findings from the individual studies were integrated in the final chapter (chapter 8). Combining qualitative and quantitative methods, i.e. mixed methods, may be particularly useful in the development and evaluation

of behaviour change interventions as findings from different methods may complement one another (O'Cathain, Murphy, & Nicholl, 2007).

There is a lack of research into the weight management experiences of overweight and obese RN personnel. Qualitative methods may be particularly advantageous for providing rich and in-depth data about participants' subjective meanings and experiences relating to weight management and the modified web-based weight loss intervention. In health psychology, qualitative data is commonly collected through interviews or focus groups, and is generally designed to minimise participant responses being led or influenced by the researcher. The aim of the qualitative components of this research programme was to explore overweight and obese RN personnel's views of weight management (chapter 4) and their perceptions of a web-based weight loss intervention (chapter 5). Semi-structured face-to-face and telephone interviews were chosen for data collection in the qualitative studies. Participants were encouraged and given the opportunity to express their personal views and perceptions. Qualitative research does not seek to remove subjectivity, sources of bias or variability among participants. While qualitative research does not achieve generalizability and precision, its strength comes from the fact that findings tend to have higher ecological validity, as a result of preserving context and detail. Qualitative research can provide insight and understanding that can help formulate hypotheses, theoretical concepts and construct measures for quantitative studies. Furthermore, qualitative methods can be used to shed light on unexpected or incomprehensible findings from quantitative research. Findings from qualitative research lack generalizability and objectivity; however this shortcoming can be addressed by also using quantitative methods. Observations and hypotheses drawn from qualitative research can be examined and tested in large-scale quantitative studies. This would address issues of reliability, generalizability, and causality.

Quantitative research seeks to provide explanations that can be generalised to other contexts. Quantitative research methods are useful for producing factual, reliable, and objective data. In this research programme, findings from chapter 3 led to the identification of the proportion of personnel potentially interested in using the web-based weight loss intervention and the characteristics of participants who were most likely to engage with the web-based weight loss intervention. It was intended that this information would be

used for purposive sampling in the qualitative studies to target personnel who would be most interested in weight management. In chapter 7, the feasibility of implementing the modified web-based weight loss intervention was evaluated, and anthropometric measurements and self-reported questionnaire responses were collected at two time points.

The research programme presented in this thesis utilised both qualitative and quantitative methods to modify and evaluate the feasibility of implementing and trialling a web-based weight loss intervention in the RN. The rationale behind mixing methods in this research programme was to achieve *complementarity* between the findings from the different studies, i.e. “[sought] elaboration, enhancement, illustration, clarification of the results from one method with the results from another” (Greene, Caracelli, & Graham, 1989, p. 259).

The literature on the appropriateness of mixing methods has been somewhat ironically mixed. Combining qualitative and quantitative methods raises several problems due to differing epistemological, methodological, methodic, and practical differences (Alise & Teddlie, 2010; Creswell & Tashakkori, 2007). On the one hand quantitative research is underpinned in positivism, which seeks verifiable findings that are based on data that is collected systematically and objectively. On the other hand, qualitative research adopts interpretivism, which seeks meaning from participants. Purely qualitative or quantitative researchers (i.e. purists) may argue that the two approaches are founded in incompatible paradigms and philosophical stances. Others argue that the differences between the different methodologies are overstated and both approaches are valuable and useful for answering different research questions (Yardley & Bishop, 2007). The ‘qualitative versus quantitative’ debate is inevitable; however, both approaches, together with their strengths and weaknesses can be used to test or develop hypotheses or to describe data.

It has generally been reported in the literature that studies using mixed methods research adopt a pragmatic philosophical stance. Pragmatism assumes that both qualitative and quantitative research methods are valuable, in the context of study design, data collection and/or analysis (Maudsley, 2011). However others have argued that a pragmatic approach may be

unreflective and naïve (Lipscomb, 2008). In the fields of psychology and health research, combining qualitative and quantitative research using a pragmatic paradigm has become increasingly common, which highlights the benefits that can be gained from using the insights of both methods.

1.4.3 Methodological considerations

The methodological considerations made for each study are presented in this section and a brief overview of the individual studies is presented in section 1.5.

1.4.3.1 Synthesising qualitative studies

A synthesis of studies of overweight and obese people's experiences with weight management and behavioural weight management interventions was conducted to develop a more comprehensive understanding of the factors that may be involved in people's weight management efforts (chapter 2). A meta-ethnographic approach was selected to guide the synthesis of the qualitative studies as the steps of the analysis has been clearly defined and the method allows for contextual information from the individual studies to be retained (Noblit & Hare, 1988). There are other methods for synthesising qualitative papers, such as grounded theory synthesis (Eaves, 2001) and thematic synthesis (Thomas & Harden, 2008) however these methods were not appropriate for the purposes of this synthesis. A grounded theory synthesis would have required all of the papers to have used similar methods and is a more comparative approach, whereas meta-ethnography allows for synthesising papers that have used different qualitative methods. Thematic synthesis mirrors the stages involved in thematic analysis approaches (Braun & Clarke, 2006) where data is first coded line by line to develop descriptive themes, which are then used to generate analytic themes. However, in undertaking this method of synthesis, contextual information from the individual papers is likely to be lost, whereas meta-ethnographic approaches are more useful for retaining information about the context.

The Critical Appraisal Skills Programme criteria (Critical Appraisal Skills Programme (CASP), 1998) was used as a checklist for assessing the quality of the papers included in the review. Although no papers were excluded on the basis of their quality rating, the CASP criteria were useful for reporting the findings of the meta-synthesis. Although other criteria and quality checklists for qualitative reports exist, the CASP is one of the most widely used and provides a systematic and clear set of criteria for evaluating the validity of an article, the results of the study, and whether the results were applicable to the aims of the research.

1.4.3.2 Data from surveys

The survey study reported in chapter 3 was nested within a larger study. The primary investigator of the larger survey study, who was also involved in the research presented in this thesis, informed the researcher of an opportunity to include up to five items within this survey to explore whether there was scope to introduce a web-based weight loss intervention in the RN for overweight and obese personnel. The Theory of Planned Behaviour (TPB) was chosen to guide the development of the survey items as the theory has demonstrated good predictive power of health behaviours based on individual's beliefs (Ajzen, 1991; Armitage & Conner, 2001). As there was limited space in the survey, more general questions were constructed instead of Ajzen's recommendations for developing TPB questionnaire items. The purpose of the five items was to gain insight into what proportion of overweight and obese RN personnel wanted to lose weight, what proportion of personnel who wanted to lose weight were interested in using a weight loss website, and what proportion of personnel wanting to lose weight reported they were capable of using a weight loss website. The aim of the survey was to identify sub-groups of overweight and obese RN personnel who may be most likely to use a web-based weight loss intervention.

1.4.3.3 Accessing Royal Navy personnel's perceptions and experiences

In order to learn more about overweight and obese RN personnel's views and experiences of weight management and the web-based weight loss

intervention semi-structured interviews (chapter 4) and think-aloud interviews (chapter 5) were conducted. Semi-structured interviews were conducted one-to-one and face-to-face with participants at the RN base the participant was stationed at and an interview guide was loosely followed in order to ensure that key topics were covered. In a think-aloud interview, the researcher records participants' ideas, thoughts and opinions about the task they are engaging in or the tool they are using (Davison, Vogel, & Coffman, 1997; Kushniruk & Patel, 2004). The researcher emphasises that participants should engage with the task or tool as if the researcher were not present and to especially focus on aspects that users dislike in order to identify usability problems.

Possible alternatives to semi-structured interviews were focus groups, however focus groups are better suited for research questions that are interested in how participants interact within the group. Focus groups are not group interviews where each participant answers the researcher's questions. Chapter 4 was particularly interested in participants' individual experiences with weight management and weight management interventions in the RN, which is why interviews were deemed more appropriate. In the think-aloud study, participants were also contacted for a follow-up telephone interview to retrospectively provide their perceptions and experiences of using the subsequent sessions of the web-based weight loss intervention. While it may be thought that follow-up telephone interviews would have allowed participants to interact more naturally with the intervention (without the presence of the researcher), the lack of opportunity for participants to report their real-time thoughts and perceptions made it difficult to obtain in-depth and rich data as was collected in the think-aloud interviews.

The data from the interview and think-aloud studies were analysed using inductive thematic analysis processes to identify patterns within the data (Braun & Clarke, 2006). This method was useful for organising and describing the data, as well as providing some interpretation that was useful for answering the respective research questions. Possible alternative methods for analysing the data include discourse analysis, interpretative phenomenological analysis, and grounded theory. These methods, unlike thematic analysis, are theoretically bound, which makes it less suitable for a mixed methods research programme.

As there is little or no qualitative research looking at the perceptions and experiences of overweight and obese personnel's of weight management and weight management interventions, it may have been useful for a grounded theory approach to be taken. The development of a theoretical model would have been practical for intervention development and its evaluation. However, given that this research programme was tasked by the RN to investigate the feasibility of implementing a web-based weight loss intervention, it was deemed most appropriate to analyse qualitative data thematically given the limited time for carrying out this research.

1.4.3.4 The feasibility of introducing a web-based weight loss intervention for Royal Navy personnel

A feasibility study was conducted to assess whether it would be possible to implement a web-based weight loss intervention for overweight and obese RN personnel. Participants from HMS COLLINGWOOD and HMS HERON could immediately access the website, and participants from HMS SULTAN and HMS NELSON were allocated to a waiting list which would allow them access to the website 3 months after signing up to the study and completing their follow-up measurements. Feasibility studies and pilot studies have been generally used interchangeably in the literature but not in this programme of research (Arain, Campbell, Cooper, & Lancaster, 2010). This thesis adopts the definition of a feasibility study provided by the National Institute for Health Research Evaluation, Trials and Studies Coordinating Centre (NETSCC) (Arain et al., 2010; Thabane et al., 2010). The purpose of a feasibility study is to be able to make estimates about important parameters that would be required in the design on the main study and can answer the question "can this study be done?". In this feasibility study, the willingness of overweight and obese RN personnel to be recruited, response-rates to questionnaires, follow-up rates, adherence rates to the web-based weight loss intervention, the involvement of physical training instructors in recruitment and assessment were evaluated. Feasibility studies may not be randomised, power calculations are not normally undertaken, and the results of studies cannot be used to make any predictions about the effectiveness of an intervention that may be used in the study. Pilot studies are smaller versions of the main study and their purpose is to assess whether all

the components of the main study work together. Processes of the main study, including recruitment, randomisation, treatment, and follow-up are evaluated, and the primary outcome may also be assessed. Despite the value feasibility and pilot studies may add in preparation of a larger and more comprehensive study, pilot and feasibility studies receive little attention in the literature, and even lesser attention in scientific research training (Thabane et al., 2010).

1.5 Thesis outline

Given the problem of overweight and obesity in the RN (sub-section 1.2.2) and the evidence for the effectiveness of web-based weight management interventions (section 1.3), this thesis presents a programme of research that aimed to evaluate the feasibility of implementing a web-based weight loss intervention for use among overweight and obese RN personnel. The chapters introduced in the sub-sections below appear in the chronological order in which they were conducted. The research project commenced in October 2010 and the final study was completed in June 2013. The final chapter ties together the findings of the empirical chapters, details the unique contribution of this thesis and relates them to the literature, and presents implications for the RN.

1.5.1 A systematic review and synthesis of qualitative literature

Chapter 2 presents a systematic review and synthesis of published qualitative papers on overweight and obese people's experiences and perceptions of weight management and behavioural weight management interventions. For the purposes of this thesis it may have been more fitting to conduct a systematic review on people's views and experiences of web-based weight loss interventions, due to the limited number of qualitative papers identified in this area, it was deemed more informative to conduct the review on a broader topic. Narrowing the focus of the review to people's experiences with web-based weight loss interventions could have left out some important insights that were gained from analysing findings on people's experiences with behavioural weight management interventions. The study aimed to identify factors perceived by overweight and obese people as relevant to successful and

unsuccessful weight management and to derive a more comprehensive understanding of people's experiences with weight management that may inform future research and practice. Furthermore, this review made a valuable contribution to the literature on people's weight management experiences, as there had not yet been a synthesis of people's views in this area.

1.5.2 Survey study

Chapter 3 presents the findings from a brief survey that was nested within the longitudinal Naval Service cohort study of occupational stress that ran through 2007 to 2011 (Bridger, 2008). The study had two aims. The first aim was to examine 1030 RN personnel's desire and perceived behavioural control (PBC) to lose weight, belief about the effectiveness of using a web-based weight loss intervention, and PBC to use a web-based weight loss intervention. This data was used to determine whether there was scope in the RN to introduce a website to support overweight and obese RN personnel in their weight loss attempts. The second aim was to contextualise findings from subsequent studies (chapter 4, 5 and 7) that were limited by smaller samples. The results of the survey complemented the findings of the interview and thinkaloud studies (chapter 4 & 5) and the feasibility study (chapter 7) by allowing triangulation of qualitative and quantitative findings, i.e. the survey study provided information on the proportion of RN personnel who may be interested in using a weight loss website from a large generalisable sample, while the subsequent studies provided deeper insight of purposive samples of overweight and obese RN personnel's weight management experiences, perceptions and behaviours.

1.5.3 Qualitative studies

Chapter 4 presents a study that aimed to understand the dietary and physical activity habits and weight management experiences of overweight and obese RN personnel. The findings were used to inform modifications to an existing web-based weight management intervention to maximise the relevance of the content of the intervention for overweight and obese RN personnel (chapter 6).

Secondly, it added a predominantly male account of weight management experiences to the literature. Additionally, the study attempted to explain how even in an environment where support for weight management is readily available, weight management may not be achieved some personnel.

Chapter 5 presents a study that aimed to explore the usability of a modified online intervention (i.e. POWeR-RN; chapter 6) for supporting overweight and obese RN personnel's weight management efforts. Understanding overweight and obese RN personnel's engagement (or non-engagement) with the modified weight loss intervention led to the identification of further modifications to improve the intervention (chapter 6) and facilitated the development of alternative approaches to implementing the intervention in the feasibility study (chapter 7).

1.5.4 Feasibility study

Chapter 7 presents a feasibility study in which the practicality of trialling and implementing a web-based weight loss intervention in the RN was evaluated. The RE-AIM framework was used for evaluating the reach, efficacy, adoption, and implementation of the intervention. The reach of the study was comparable to other contexts, such as community and primary care samples. Preliminary and exploratory analyses suggest that participants who used the intervention did lose weight and that the intervention had a medium effect size. In terms of adoption, it was possible to recruit participants from all but one of the selected RN bases. The intervention was originally designed to be implemented with some support from physical training instructors; however it was not possible for physical training instructors to arrange the supportive meetings with participants. Several suggestions were made based on this study for improving overweight and obese RN personnel's engagement with weight management interventions.

1.5.5 General discussion

This applied programme of research is the first to assess the feasibility of implementing and trialling a modified web-based weight loss intervention for use among overweight and obese RN personnel in the UK. The synthesis of qualitative studies focused on overweight and obese people's experiences with behavioural weight management interventions. The qualitative empirical chapters present overweight and obese RN personnel's perceived factors that may be involved in their decisions to engage with weight management. Some suggestions are provided for the RN for increasing overweight and obese personnel's engagement with web-based weight loss interventions.

2. A synthesis of qualitative research on overweight and obese people's views and experiences of weight management

2.1 Introduction

As outlined in chapter 1, this chapter presents a systematic review of the literature on overweight and obese adults' experiences and perceptions of weight management and behavioural weight management programmes. Qualitative papers that explored the experiences and/or views of obese and/or overweight adults on weight management and behavioural weight management interventions were analysed and synthesised using meta-ethnography (Noblit & Hare, 1988).

The International Association for the Study of Obesity (International Association for the Study of Obesity, 2008) reports that around 1.5 billion adults worldwide are either obese or overweight. Obesity is associated with many adverse outcomes, including morbidity, disability, premature death (World Health Organisation, 2010), poor mental health (Atlantis & Baker, 2008), stigma and discrimination (Puhl, Moss-Racusin, Schwartz, & Brownell, 2008). Sustained weight loss of 5-10% of initial body weight in overweight and obese people has been associated with benefits to physical and psychosocial health, functional ability, and quality of life (Barte et al., 2010). Despite the wide variety of individual and population based interventions that have been developed to address obesity, the rise in obesity rates suggests that the long-term results of such interventions have generally been poor (Marinilli Pinto et al., 2008).

Systematic reviews have been conducted to evaluate the effectiveness of weight management interventions in order to establish which types of interventions, or components of interventions, are most effective for supporting overweight and obese people to adopt dietary and physical activity behaviours associated with weight management (Galani & Schneider, 2007; Shaw, O'Rourke, Del Mar, & Kenardy, 2005). Meta-analyses indicate that lifestyle interventions appear to be more effective than interventions focusing

on immediate weight loss (Galani & Schneider, 2007; Shaw et al., 2005). Previous reviews of the factors associated with weight management have tended to focus on quantitative studies, and has been useful for identifying determinants of weight management (Elfhag & Rössner, 2005). The potential contribution of the perspectives of people who attempt to manage their weight has received less attention.

Quantitative research typically provides limited information about how and why adults adopt, maintain or cease to engage in behaviours associated with weight management in the long-term. The effectiveness of weight management interventions may be improved by a better understanding of how and why successful and unsuccessful weight management occurs. Hence, one way of improving weight management programmes may be to learn from the views of the target users regarding their acceptability and feasibility. Numerous qualitative studies have investigated overweight and obese people's views of weight loss and their experiences with weight management programmes. Such studies are valuable for identifying limitations of existing programmes and offering suggestions for improvements from overweight and obese people's viewpoint. However, most have focused on people's views regarding a single programme, in a single context, and their generalizability to other programmes is therefore unclear.

Qualitative studies are increasingly recognised as an important source of evidence for public health (Dixon-Woods, Fitzpatrick, & Roberts, 2001). The feasibility and usefulness of using meta-ethnography (Noblit & Hare, 1988) to synthesize qualitative research in a defined field of study has been demonstrated (Campbell et al., 2003; Pound et al., 2005). However, there are no existing published syntheses of qualitative research on overweight and obese people's experiences with weight management and weight management programmes.

This systematic review was undertaken to identify and synthesise published qualitative findings of overweight and obese adults' experiences and perceptions of weight management and behavioural weight management programmes. The aim was to identify factors perceived by overweight and obese people as relevant to successful and unsuccessful weight management and to derive a more comprehensive understanding of people's experiences with weight management that may inform future research and practice.

2.2 Methods

2.2.1 Meta-ethnography

Meta-ethnography is an interpretive approach that was initially developed for synthesising ethnographic research in the field of education (Noblit & Hare, 1988) and is now “perhaps the most well-developed method for synthesising qualitative data” (Britten et al., 2002, p. 210). Therefore, meta-ethnography was selected as the method for synthesising published qualitative studies focusing on overweight and obese people’s experiences with weight management. Noblit and Hare (1988, p. 26-29) outline seven steps to conducting a meta-ethnography. In the interest of clarity, the seven steps have been presented separately but in reality the synthesis was an iterative process. The steps have been outlined below:

1. *Getting started* – The first step involved determining the aim of the meta-ethnography. This study aimed to synthesise findings from published qualitative studies on overweight and obese people’s perceptions of and experiences with weight management.
2. *Deciding what is relevant to the initial interest* – Published qualitative studies exploring the experiences and views of obese and/or overweight adults towards weight management, within and outside the context of behavioural weight management interventions, in North American, UK, European and Australian settings were of interest. Further details of the search strategy and selection criteria have been described under the section titled ‘systematic search of the literature’.
3. *Reading the studies* – At this stage of the study the selected papers were repeatedly read, while analysing and noting themes in the studies.
4. *Determining how the studies are related* – Noblit and Hare (1988, p. 36) describe three ways in which the chosen studies might be related. Studies may be “reciprocal,” in which findings from some of the studies are encompassed by other selected studies; studies may be “refutational,” where the findings of one study opposes findings from another; and when individual studies focus on different aspects of the topic of interest, a “line of argument” can be made. In this study, two types of relationships were identified among the selected papers. There was a reciprocal relationship between some studies in which findings from one paper were encompassed by another study. A line of argument synthesis was also conducted given that the selected studies offered interpretations of different aspects of overweight and obese people’s experiences with weight management.
5. *Translating the studies into one another* – Noblit and Hare (1988) suggest that each author uses their own “interpretative explanation” (p.

7) or an “interpretive language” (Malpass *et al.*, 2009) for expressing their findings. The term ‘translation’ can be conceptualised as the interpretations of the authors of the meta-ethnography, of the interpretations of authors of the individual studies, of participants’ interpretations of their experiences.

6. *Synthesizing translations* – In this step, translations of individual studies contributed to deriving a more comprehensive understanding of overweight and obese participants’ experiences with weight management.
7. *Expressing the synthesis* – This meta-ethnography is published in the journal *Clinical Obesity*, which is one of the main publications of the International Association for the Study of Obesity. Target readers of the journal include health professionals and researchers involved in the prevention and management of obesity.

2.2.2 Selection criteria

Qualitative studies were eligible if they explored the experiences and views of obese and/or overweight adults regarding weight management and behavioural weight management interventions, in North American, European and Australian settings. Studies involving medical populations undergoing surgery or pharmacological weight management interventions were excluded, as these experiences were considered to be very different from behavioural weight management. The perspectives of health professionals and relatives were excluded. Only studies written in English were included in this study. Unpublished theses and dissertations were not considered for this meta-ethnography as they may not have been subject to the rigorous reviewing that published studies have undergone.

2.2.3 The search strategy

A systematic literature search was conducted from up to November 2010 utilising a range of electronic databases. Databases searched and the search terms used are detailed in Table 1. The search terms overweight/obese and qualitative/qualitative research were searched as key terms while the remaining terms were entered into the databases using MeSH explode, where this was possible. In databases where it was possible to specify the participants’ age range, studies using adult samples were selected.

The searches initially identified 943 references which were imported into an EndNote bibliographic database. Following a process of electronic and manual elimination of duplicates, the number was reduced to 596 records. Titles and abstracts were searched to identify papers of potential relevance. There were few papers published before 1990 and overweight and obese people's experiences with weight management were qualitatively different in studies published post-1990. We attributed this difference to changes in the prevalence of obesity. Therefore, for the meta-ethnography a 20-year period, from 1990 to 2010, was considered adequate to cover the most recent research on overweight and obese adults' views on weight management. Five hundred and seventy eight studies did not meet the inclusion criteria in terms of the aims of the study, study setting, language, year of publication, and characteristics of the sample, which resulted in 18 studies that were selected for further screening. Full texts were obtained for the 18 studies.

One of the 18 articles was excluded as its aims were incompatible for the purposes of this chapter; the paper did not present the views of overweight and obese people regarding weight management. Seventeen papers met the inclusion criteria (see Table 2 for study characteristics), a sample size which is compatible with Sandelowski and Barroso's (2007) recommendation of including at least 10-12 studies in a meta-synthesis. The reference lists of potentially relevant papers were searched but no further articles were identified. Figure 1 shows the study selection process.

Table 1 Databases searched and search terms used

Databases searched	Interface	Coverage
PsycINFO	EBSCO	1806 to November 2010
MEDLINE	Ovid SP	1966 to November 2010
EMBASE	Ovid SP	1980 to November 2010
Web of Science	ISI Platform	WoKnowledge 1981 to November 2010
OR	AND OR	AND OR
Overweight obes*	"weight loss" "weight control" "weight reduction" "weight management" "weight maintenance" "weight perception"	"qualitative research" Qualitative interview* "focus groups" narrative* "grounded theory"

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Table 2 Study characteristics

Authors	Aims	Setting	Participants, sample selection and socioeconomic factors	Data collection	Data analysis
1.Davis <i>et al.</i> (2005)	Examined obese women's experiences with weight-loss methods	Maryland, USA	Purposive volunteer sample of obese African American and White women ($n = 27$)	Focus groups ($n = 4$)	Grounded Theory approach
2.Visram <i>et al.</i> (2009)	Explored the views and experiences of patients who recently completed a primary care-based weight management intervention	Newcastle, UK	Purposive volunteer sample of overweight and obese patients ($n = 20$) recently completing a weight management programme	Semi-structured interviews ($n = 20$)	Subject coding and thematic representations (Miles & Huberman, 1984)
3.Fogel <i>et al.</i> (2009)	Described the experience of weight loss efforts among lesbians participating in a predominantly lesbian weight loss group	USA	Self-identified overweight lesbians ($n = 14$)	Focus groups ($n = 2$)	Template Analysis (Crabtree & Miller, 1999)
4.Bidgood <i>et al.</i> (2005)	Explored obese adults' accounts of their experiences and feelings during their attempts to lose weight and to maintain a reduced weight	Hertfordshire, UK	Volunteer sample of obese men and women ($n = 18$)	Semi-structured interview ($n = 8$); focus groups ($n = 2$)	Thematic analysis

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5.Lopez (1997)	Described women's experiences of weight treatment and how they integrated the requirements of the programme into their daily life activities	USA	Purposive volunteer sample of women ($n = 6$) attending one of three weight treatment programmes	Series of three in-depth interviews ($n = 6$)	Smith's (1987) feminist framework was used to focus the inquiry on women's daily experiences with their chosen weight treatment programs within the context of American culture. No information on data analysis given
6.Adolfsson <i>et al.</i> (2002)	Identified the circumstances considered to be important for obese individuals participating in a lifestyle intervention programme for weight reduction	Stockholm, Sweden	Volunteer sample of overweight and obese attendees ($n = 15$) in a weight reduction programme	Series of four semi-structured interviews ($n = 15$)	Transcripts coded according to topic using a vertical and horizontal coding system (Riley, 1966)
7.Johnson (1990)	Described and analysed the experience of the weight loss process among participants attending a weight loss programme	USA	Purposive volunteer sample of attendees ($n = 13$) of a weight loss programme	Series of in-depth interviews ($n = 13$)	Grounded theory
8.Van Zandvoort <i>et al.</i> (2009)	Explored obese female university students' views on their experience of a co-active life coaching intervention	Ontario, Canada	Obese female university students ($n = 5$)	Semi-structured interviews ($n = 5$) conducted pre- and post- participation in the coaching intervention	Inductive content analysis

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9.Groven <i>et al.</i> (2010)	Explored how women experience training as a means of losing weight	Norway	Purposive volunteer sample of obese women ($n = 5$) participating in an exercise programme	In-depth interviews ($n = 5$)	“Bricolage” (Kvalve & Brinkmann, 2009) Integration of several analytic techniques to systematically analyse transcripts Grounded Theory
10.Barberia <i>et al.</i> (2008)	Explored obese and overweight women’s beliefs and attitudes related to eating behaviours	Spain	Overweight and obese female ($n = 17$) outpatients participating in a weight loss programme	In-depth interviews ($n = 17$)	
11.Miles <i>et al.</i> (2006)	Assessed the ways in which the perceived quality of community environments affects low-income women’s efforts to increase physical activity	USA	Overweight and obese women ($n = 25$) participating in an intervention to increase number of daily steps taken	In-depth interview ($n = 25$)	Content analysis
12.Herriot <i>et al.</i> (2008)	Investigated obese adults’ reasons for volunteering for a weight loss programme and their experiences in a commercial weight loss programme	Surrey, UK	Obese adults ($n = 32$) participating in one of four commercial weight loss programmes	Baseline focus groups ($n = 6$); follow-up focus groups ($n = 4$)	Classical long table approach (Kruger & Casey, 2000)

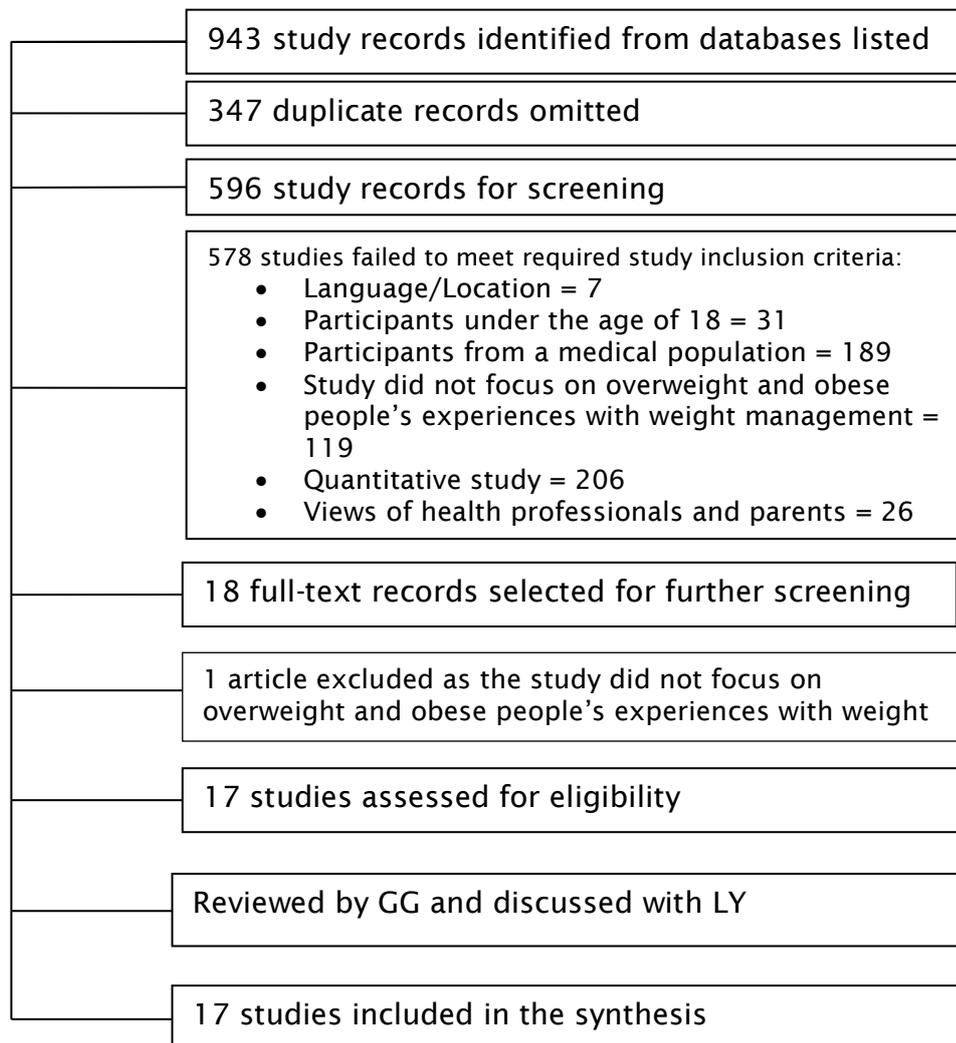
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13.Jones <i>et al.</i> (2007)	Investigated obese adults' views on attending community dietetic clinics, on dietetic service, the outcomes of dietary treatment in terms of lifestyle change and the impact of the dietician	Ayrshire, West of Scotland	Obese patients ($n = 24$) attending dietetic clinics for weight management	Semi-structured interviews ($n = 24$)	Content analysis
14.Burke <i>et al.</i> (2009)	Explored participants' experience of self-monitoring and described their feelings, attitudes, and behaviours while using a diary to self-monitor their diet and exercise	USA	Purposive volunteer sample of overweight adults ($n = 15$) participating in a behavioural weight loss intervention	Semi-structured interviews ($n = 15$)	Inductive content analysis
15.Sabiston <i>et al.</i> (2009)	Explored the experiences of overweight women participating in a physical activity intervention	Canada	Overweight, inactive women volunteering in the physical activity intervention ($n = 8$)	In-depth interviews ($n = 8$)	Interpretative Phenomenological Analysis (Smith, 1996)
16.Greener <i>et al.</i> (2010)	Investigated the perspectives of lay overweight people about their beliefs of the causes of obesity and effective interventions to manage their weight	UK	Purposive volunteer sample of self-identified overweight men and women ($n = 34$)	Interviews ($n = 34$)	Framework approach

Chapter 2

17. Cioffi (2002)	Explored factors that influence participants' transition from a weight management programme	Australia	Purposive volunteer sample ($n = 12$)	Interviews ($n = 12$)	Thematic analysis
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Figure 1 Flow chart for selecting studies



2.2.4 Quality assessment

A wide range of criteria exists in the literature for evaluating qualitative research (www.qualres.org) (Hannes, 2011). A structured appraisal tool was used to evaluate the quality of the studies included in the meta-ethnography (Dixon-Woods, Booth, & Sutton, 2007); a modified version of the critical appraisal skills programme for qualitative research (Critical Appraisal Skills Programme (CASP), 1998) by Campbell and colleagues (2003) was used for this purpose to evaluate 18 papers prior to conducting the synthesis. The CASP was chosen as it most closely matched the approaches used in the selected studies for the synthesis. The research student and supervisor discussed the

evaluation of each paper in light of the modified CASP criteria. As per the CASP criteria, two screening questions were used to eliminate papers that were inappropriate for the purposes of the synthesis; 'is this paper a qualitative study and did it involve qualitative methods of data collection and analysis?' and 'is the research relevant to the synthesis topic?' One study was excluded at this stage. All the remaining 17 studies were considered of sufficient quality to be included in the synthesis. Ratings for each paper based on the 11 CASP criteria can be found in Appendix A.

Papers from journals with generous word limits (mainly papers from the field of nursing) were easier to evaluate because the length of articles allowed the research process to be more fully described. Papers published in medical journals (e.g. (Davis, Clark, Carrese, Gary, & Cooper, 2005)) and a study that used mixed-methods (Miles & Panton, 2006) were often poorly rated using the CASP tool due to lack of space to provide methodological details. Most papers ($n = 16$) reported the type of qualitative data analysis used in the study, with the exception of Lopez (1997). However, only Lopez reported the theoretical framework from which the study was conducted. However, it became evident that study quality as assessed by the CASP criteria did not affect the contribution of a paper to the synthesis. Descriptive studies with a well-described and satisfactory methodology offered few insights, while conceptual studies with rigorous analysis made substantial contributions to the development of the themes and findings of this study even if their method was less comprehensively described (Daly et al., 2007).

2.2.5 The synthesis

Meta-ethnography is an interpretive approach that was initially developed for synthesising ethnographic research in the field of education (Noblit & Hare, 1988) and was selected for the purpose of this review because it is now one of the most well-developed methods for synthesising qualitative data (Britten et al., 2002). Noblit and Hare suggest that concepts from individual studies can be synthesised to develop a broader interpretation of the written interpretive accounts by a process called 'reciprocal translational analysis'. The process of 'translation' involves identifying common and recurring concepts across the

individual papers to derive 'third-order constructs'. According to Noblit and Hare, 'second-order constructs' are concepts developed by the authors of the individual papers, which are based on the 'first-order constructs' (i.e. participants' accounts). Noblit and Hare use the term 'constructs' but in this paper we will use the term 'themes' as it conveys a similar meaning and is more widely recognised.

For this meta-ethnography, the seventeen included articles were read in full several times, noting the main themes, descriptions and quotes representative of each of the themes. Fourteen (Adolfsson, Carlson, Uden, & Rossner, 2002; Barberia, Attree, & Todd, 2008; Burke, Swigart, Turk, Derro, & Ewing, 2009; Cioffi, 2002; Fogel, Young, & McPherson, 2009; Groven & Engelsrud, 2010; Herriot, Thomas, Hart, Warren, & Truby, 2008; Johnson, 1990; Jones, Furlanetto, Jackson, & Kinn, 2007; Lopez, 1997; Miles & Panton, 2006; Sabiston, McDonough Meghan, Sedgwick Whitney, & Crocker Peter, 2009; van Zandvoort, Irwin, & Morrow, 2009; Visram, Crosland, & Cording, 2009) of the 17 selected papers focused on people's experiences with weight management programmes, while 3 papers (Bidgood & Buckroyd; Davis et al.; Greener, Douglas, & van Teijlingen, 2010) explored people's experiences with weight management outside the context of weight management programmes. A grid was created to aid the 'translation' of studies into one another. Each paper was entered into a separate column and the themes from each paper entered into the grid. The grid was explored to identify related themes that could be grouped together across studies.

A coding manual was developed using the second-order themes to derive third-order themes (Appendix B). The second-order themes in each paper were compared with those from other studies. Similar themes were grouped together. Third-order themes were developed through translating the themes through an iterative process of review and discussion with my supervisor based on my interpretations of the findings from the studies reviewed.

2.3 Results

Seventeen studies were reviewed in this paper. Eight were conducted in the USA and Canada, five in the UK, three in Europe, and one study was undertaken in Australia. Participants' demographic characteristics were diverse in terms of age, socioeconomic status, sexuality, and ethnicity. The total number of participants was 290; at least 224 participants were women but one study (Greener et al., 2010) did not report the number of participants by gender. Eight studies involved mixed samples, while nine studies reported female-only samples from diverse backgrounds. Twelve third-order themes were derived from the papers that were reviewed and are presented in Table 3. Participation in weight management programmes was not common in all the selected studies. Table 4 illustrates participants' quotes that are representative of the third-order themes.

Table 3 Summary of themes derived from the studies reviewed

Third-order themes	Second-order themes	Papers from which themes derived
Health concerns	Motivation to improve health; existing health problems; legitimization from health professionals	Visram et al., 2009; Herriot et al., 2008; Greener et al., 2010; Fogel et al., 2009; Barberia et al., 2008; Jones et al., 2007; Miles & Panton, 2006
Expectations towards weight management	Weight management processes; unrealistic expectations; realistic expectations	Groven & Engelsrud, 2010; Herriot et al., 2008; Jones et al., 2007
Attributions for weight gain and the maintenance of excess weight	Unhealthy behaviours and eating habits; lack of physical activity; physical and psychological problems	Greener et al., 2010; Johnson, 1990; Miles & Panton, 2006
Psychological factors		
Facilitators	Internal changes; understanding one's eating and dieting patterns	Burke et al., 2009; Johnson, 1990
Barriers	Previous weight loss attempts; eating for reasons other than hunger; feeling unable to manage weight	Herriot et al., 2008; Burke et al., 2009; Greener et al., 2010; Fogel et al., 2009; Barberia et al., 2008; van Zandvoort et al., 2009; Adolfsson et al., 2002; Cioffi,

Self-perception and body image	Feelings related to excess weight; motivation to improve body image; weight management as a personal responsibility	2002; Bidgood & Buckroyd, 2005 Miles & Panton, 2006 Lopez, 1997; Herriot et al., 2008; Burke et al., 2009; Greener et al., 2010; Fogel et al., 2009; Barberia et al., 2008; van Zandvoort et al., 2009; Johnson, 1990; Sabiston, McDonough Meghan, et al., 2009
Stigmatising experiences	Experiences of stigma; stigma as a barrier and motivator to weight loss	Visram et al., 2009; Groven & Engelsrud, 2010; Herriot et al., 2008; Bidgood & Buckroyd, 2005;
Sociocultural factors	Competing daily responsibilities; influences of family and friends; societal and cultural influences	Visram et al., 2009; Lopez, 1997; Herriot et al., 2008; Burke et al., 2009; Greener et al., 2010; Barberia et al., 2008; van Zandvoort et al., 2009; Adolfsson et al., 2002; Bidgood & Buckroyd, 2005; Jones et al., 2007; Davis et al., 2005
Environmental factors Facilitator Barriers	Reorganising the environment Availability of tempting food; costs; safety and security concerns; services and facilities	Johnson, 1990; Herriot et al., 2008; Greener et al., 2010 Barberia et al., 2008; van Zandvoort et al., 2009; Jones et al., 2007; Miles & Panton, 2006
Experiences with the programme	Support from peers and health professionals; obligations to attend; intervention environment liked; conflict between structure and participant's desire to be in control; dependence	Visram et al., 2009; Lopez, 1997; Groven & Engelsrud, 2010; Herriot et al., 2008; Burke et al., 2009; Greener et al., 2010; Fogel et al., 2009; Barberia et al., 2008; van Zandvoort et al., 2009; Adolfsson et al., 2002; Cioffi, 2002; Bidgood & Buckroyd, 2005
Positive outcomes of programme participation	Knowledge and skills; weight loss; weight loss-related psychological benefits; weight loss-related physical benefits; improved lifestyle	Visram et al., 2009; Burke et al., 2009; Fogel et al., 2009; van Zandvoort et al., 2009; Adolfsson et

al., 2002; Cioffi,
2002; Jones et al.,
2007

Table 4 Quotes illustrating the third-order themes

Theme	Representative Quotes
Health concerns	“The doctor telling you you’re not well. [...] when somebody says ‘you’ve got seriously high blood pressure and it’s your life’ type of thing, you get off your backside and you try to do something about it.” (Male) (Visram et al., 2009)
Expectations towards weight management	“...I’m really trying to get [the weight] off. I’m eating better, but it’s not coming off -it’s not getting off as fast as I hoped it would.” (Female, obese) (van Zandvoort et al., 2009)
Attributions for weight gain and the maintenance of excess weight	“I live a stressful life during the day and love eating at night. I lie in bed, watch TV and eat cheese, crackers, fruit, and sandwiches... I don’t want to deprive myself. I have a right to enjoy something.” (Female, 38, obese) (Adolfsson et al., 2002)
Psychological facilitators	‘...with the other diets that I’ve done before, you get so far then the line and you give up. But because I can still say I’m losing weight, it’s an incentive to continue to be careful.’ (Female) (Visram et al., 2009)
Psychological barriers	When I get depressed I feel anxious and I go directly to the fridge(...)my way of escape is the food (Alicia, Obese, 27 years) (Barberia et al., 2008)
Self-perceptions and body image	“When no one else is around I look in the mirror at myself – I look good. If someone else comes into the room, I look fat. I see myself differently when someone else is around.” (Johnson, 1990)
Stigmatising experiences	“If you’re waiting to be served, you can be overlooked . . . big as you are, you can be invisible. People make snide comments to each other in lifts. In passing they will stare.” (Bidgood & Buckroyd, 2005)
Sociocultural factors	“It is very hard if I have to cook for my children. Say that I am preparing 3 sandwiches of Nutella, come on! You have to have loads of willpower! And you always try a bit...” (Lucia, Overweight, 40 years) (Barberia et al., 2008)
Environmental facilitators	“I’m getting all of the things out of the way that I could for an excuse. I’m not even watching TV very much ... TV is loaded with commercials about eating all the wrong

	things. ... I've tried to surround myself with things that are going to be positive." (Johnson, 1990)
Environmental Barriers	"It's impossible to eat healthily at work due to a lack of healthy eating facilities." (Jones et al.)
Experiences with the programme	"I walked into the first meeting; it just felt like I had found a home, and every week has been successful so far. I cannot imagine not doing it [coming to the meetings] on Saturday mornings. So—I am very grateful for this meeting." (Fogel et al., 2009)
Positive outcomes of programme participation	"She is my motivator. She weighs and measures me. And she makes me keep a record of my diet. I fill out a form and then she gives me advice as to how I can eat healthier meals . . . How I can do even better. So I think it is really nice to participate in her treatment program" (Groven & Engelsrud, 2010)

Health concerns related to excess weight

Many studies found that the existence of health problems (Miles & Panton, 2006) and the desire to prevent future health problems (Barberia et al., 2008; Fogel et al., 2009; Greener et al., 2010; Herriot et al., 2008; Jones et al., 2007; Visram et al., 2009) were the main reasons reported why some people engaged in weight management. For example, Visram and colleagues (2009) found that twenty overweight and obese people viewed health professionals as a legitimate source informing them of the consequences of excess weight on their health, which motivated them to manage their weight.

Expectations of weight management

Studies revealed that people's expectations of the weight management process varied which may influence their weight management attempts. Groven and colleagues (2010) conducted in-depth interviews with obese middle-aged women and found that participants had ambivalent attitudes towards weight management, which were related to fluctuations in their weight. Some studies revealed unrealistic expectations of weight management (Herriot et al., 2008; Jones et al., 2007), which led to disappointment and negative attitudes towards

the weight management programme and/or towards themselves (Jones et al., 2007).

Some people had more realistic expectations (Herriot et al., 2008), which may have facilitated the development of effective strategies to deal with potential relapses. For example, one study found that five obese women attending a weight management intervention aiming to increase physical activity levels expected to experience physical discomfort during the sessions and attributed this to their excess weight (Groven & Engelsrud, 2010). It was reported that participants believed that by persevering with the programme, engaging in physical activity would cause less physical discomfort as they lost weight.

Attributions for weight gain and the maintenance of excess weight

A variety of attributions were made for weight gain and the maintenance of excess weight when people were not trying to manage their weight. Many overweight and obese people between the ages of 18-50 commonly attributed their excess weight to unhealthy behaviours (Greener et al., 2010) and dietary (Greener et al., 2010; Miles & Panton, 2006) and physical activity patterns (Greener et al., 2010; Miles & Panton, 2006) that were incompatible with weight management. These people attributed their excess weight to modifiable behaviours, suggesting they were knowledgeable about how to successfully manage weight and viewed weight maintenance as a personal responsibility.

Miles and colleagues (2006) reported that overweight and obese women from low-socioeconomic backgrounds viewed physical and psychological problems as the main cause of weight gain and the maintenance of excess weight. In a few studies (Greener et al., 2010; Johnson, 1990; Miles & Panton, 2006) some people attributed their excess weight to genetic factors, life events and having children. For these people, excess weight was attributed to uncontrollable factors, which may have implications for their attitudes towards weight management.

Psychological factors

Studies identified a variety of psychological factors that may hinder or facilitate people's weight management attempts. Previous experiences of unsuccessful weight management were described as potentially influencing people's confidence to successfully manage weight in the future (Bidgood & Buckroyd, 2005; Fogel et al., 2009; Greener et al., 2010; Herriot et al., 2008). The majority of studies reported that many people felt they were unsuccessful with weight management because they lacked the willpower (Barberia et al., 2008; Burke et al., 2009; Greener et al., 2010) or knowledge and skills (Burke et al., 2009) for successful weight management, had psychological problems (Burke et al., 2009; Miles & Panton, 2006; van Zandvoort et al., 2009), or reverted back to old dietary habits (Burke et al., 2009; Cioffi, 2002). Another explanation for unsuccessful weight management was people eating for reasons other than hunger, such as emotional and habitual eating (Adolfsson et al., 2002; Burke et al., 2009; Herriot et al., 2008).

According to one study in which thirteen overweight and obese women were interviewed, understanding one's eating and dieting patterns was helpful for the identification of unhelpful behaviours, which guided the development of a plan for weight management (Johnson, 1990). Other studies suggested that successful weight management was associated with achieving a psychological preparedness to integrate weight management strategies into everyday life and to be committed to self-management (Burke et al., 2009; Johnson, 1990).

In sum, it may be necessary to help overweight and obese people identify and address psychological barriers to weight management such as maladaptive habits, poor self-regulation skills, low motivation or emotional problems.

Self-perception and body image

Findings suggest that self-perception and body image are related to weight management in various ways. A few studies identified overweight and obese women having positive self-perceptions (Johnson, 1990; Sabiston, McDonough Meghan, et al., 2009; van Zandvoort et al., 2009) and Sabiston et al (2009) found that four out of eight White women reported benefits of excess weight.

On the other hand, some studies found that overweight and obese people had negative feelings towards their weight status, such as shame (Fogel et al., 2009; Greener et al., 2010) and feeling self-conscious (van Zandvoort et al., 2009). Van Zandvoort et al (2009) revealed that five female obese university students felt remorse about their weight and lifestyle choices, which may have motivated them to engage in weight management. Indeed, in some studies, improving self-perception and body-image were motivations to manage weight (Barberia et al., 2008; Greener et al., 2010; Herriot et al., 2008; Lopez, 1997; Sabiston, McDonough Meghan, et al., 2009). Where weight management was reported as being perceived as a personal responsibility (Burke et al., 2009; Greener et al., 2010; Sabiston, McDonough Meghan, et al., 2009), successes and failures related to weight management may influence self-perception. In summary, negative self-perceptions can motivate weight management, which then may improve self-perceptions.

Stigmatising experiences related to excess weight

Some studies found that people with excess weight experienced stigma, which had varied influences on people's weight management efforts. Stigmatising experiences hindered obese people's attempts to manage their weight by deterring them from taking up activities in public spaces (Bidgood & Buckroyd, 2005; Groven & Engelsrud, 2010; Visram et al., 2009). One study found that negative comments from partners could lead to negative feelings, which were described as a motivation to engage in weight management for some overweight and obese women (Herriot et al., 2008).

Sociocultural factors

Sociocultural factors could either support or obstruct weight management efforts. Three studies (Burke et al., 2009; Davis et al., 2005; Visram et al., 2009) reported that family and friends facilitated overweight and obese people's weight management efforts by encouraging them to engage in weight management and weight management behaviours. Spouses and co-workers were particularly identified as an invaluable source of support (Burke et al., 2009).

However, a larger proportion of studies described how sociocultural factors hindered weight management attempts. Pressure from family and friends for overweight and obese people to manage their weight actually left some women less inclined to manage their weight (Barberia et al., 2008; Davis et al., 2005; Jones et al., 2007; van Zandvoort et al., 2009). Family and friends were identified as unintentional saboteurs of weight management efforts by making unhealthy palatable foods available (Burke et al., 2009) and disrupting time that had been set aside for physical activity (Lopez, 1997). Six studies (Adolfsson et al., 2002; Barberia et al., 2008; Burke et al., 2009; Greener et al., 2010; Herriot et al., 2008; Jones et al., 2007) suggested that daily family and work routines and responsibilities competed with and hindered weight management attempts. According to these studies, overweight and obese people lacked the time to plan and engage in weight management due to family and/or work commitments, and life events. One study revealed that obese people felt unsupported at a societal level because society generally did not take into account obese people's weight management-related concerns (Bidgood & Buckroyd, 2005). Davis et al (2005) reported that food had a central focus in the African American culture, which encouraged dietary patterns that were incompatible with successful weight management.

In summary, involving family and friends in weight management attempts may help people persevere with weight management behaviours, as long as family and friends support overweight and obese people sensitively, in order to avoid provoking negative responses.

Environmental factors

Studies identified environmental barriers to weight management, such as the ease of access to unhealthy food (Barberia et al., 2008), the financial costs of healthy eating and participation in some weight management programmes (Greener et al., 2010; Herriot et al., 2008; Jones et al., 2007), and the difficulty of accessing services and facilities for weight management (Jones et al., 2007; van Zandvoort et al., 2009). A major barrier to increase physical activity, such as walking in one's neighbourhood, was related to people's safety and security concerns in their communities (Greener et al., 2010; Miles & Panton, 2006). On a more positive note, some overweight and obese middle-class women found

that reorganising their own environment, for example by not buying unhealthy food, facilitated weight management efforts (Johnson, 1990).

In summary, findings suggest that there are a variety of environmental barriers to weight management but by developing ways to reorganise one's environment, such obstacles may be eliminated.

Experiences of weight management programmes

The social context of weight management programmes appears to be an important source of motivation and support. A prominent theme in seven studies related to people's positive views of support from contact with peers and health professionals in weight management programmes (Burke et al., 2009; Fogel et al., 2009; Greener et al., 2010; Groven & Engelsrud, 2010; Herriot et al., 2008; Lopez, 1997; Visram et al., 2009). Participants liked the tailored, face-to-face support provided by health professionals in the weight management programmes (Fogel et al., 2009; Greener et al., 2010; van Zandvoort et al., 2009; Visram et al., 2009). Contact with peers afforded people with a safe, affirming and supportive environment for sharing experiences related to weight management (Burke et al., 2009; Fogel et al., 2009; Greener et al., 2010; Groven & Engelsrud, 2010; Herriot et al., 2008; Lopez, 1997; Visram et al., 2009). This was especially highlighted in two focus groups with 14 overweight and obese lesbians, who stated they had rarely felt supported in their weight management attempts (Fogel et al., 2009). Two studies reported that people attended weight management programmes due to perceived pressure from health professionals (Barberia et al., 2008) and because of an awareness of being part of a research study (Burke et al., 2009).

The extent to which control is imposed by the weight management programme can be problematic. Lopez (1997) reported that six overweight and obese women desired to make personal choices regarding their weight management behaviours. Conversely, in one study (Adolfsson et al., 2002), participants felt the weight management programme failed to provide adequate structure to support their needs. In addition, a few studies found that some overweight and obese people indicated they relied on continued

attendance at the weight management programme to successfully manage their weight (Bidgood & Buckroyd; Cioffi, 2002; Groven & Engelsrud).

In summary, weight management programmes can provide structure and support for people attempting to manage their weight but need to foster individuals who can make autonomous weight management decisions, in and out of the context of the programmes.

Positive outcomes of participating in a weight management programme

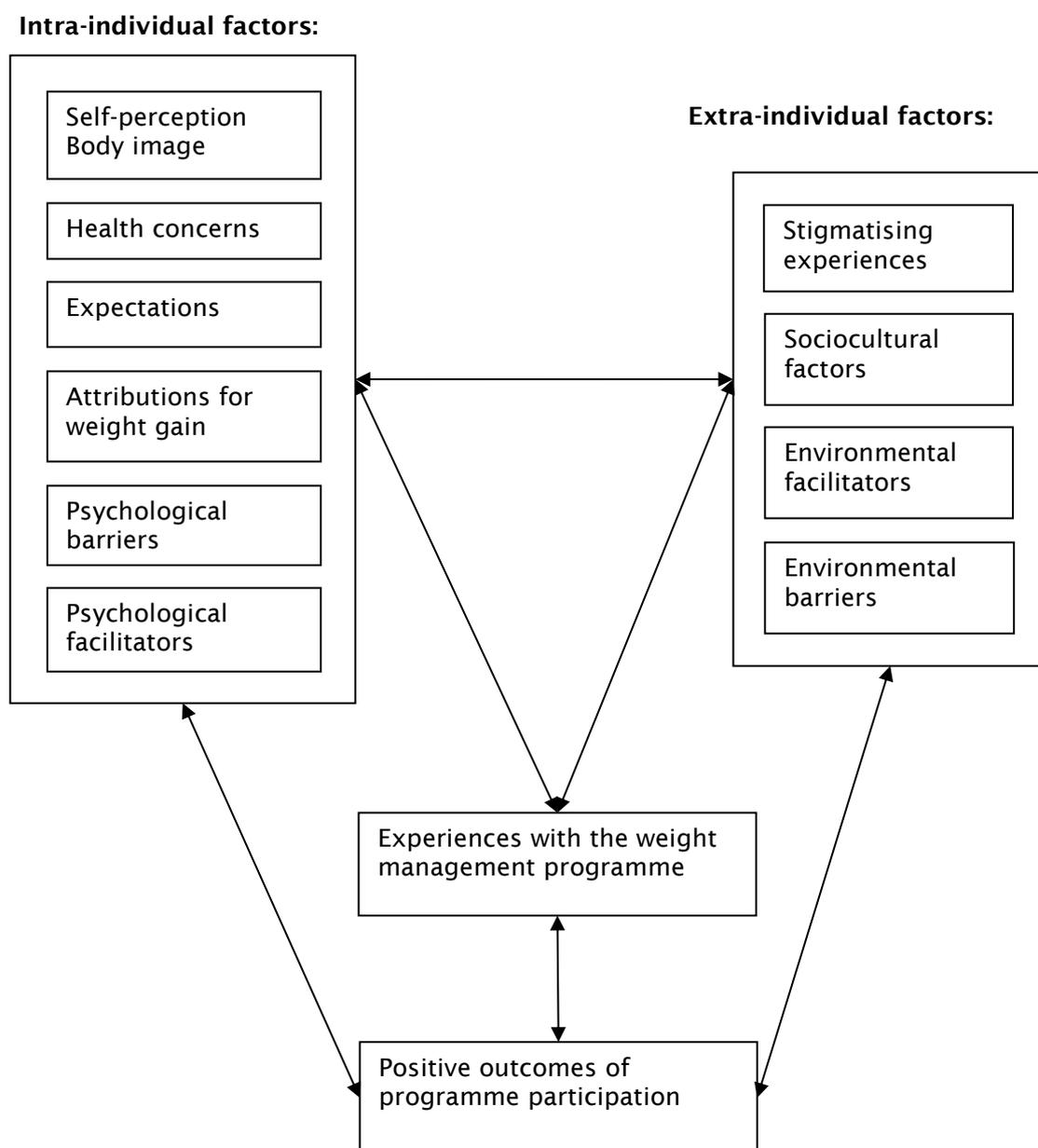
A wide variety of benefits of participating in weight management programmes were identified, including weight loss (Cioffi, 2002), weight loss-related physical improvements (Jones et al., 2007), weight loss-related psychosocial benefits (Cioffi, 2002; Fogel et al., 2009; Jones et al., 2007; van Zandvoort et al., 2009), gaining knowledge and skills to manage weight (Adolfsson et al., 2002; Burke et al., 2009; Jones et al., 2007; Visram et al., 2009), and improvements in lifestyle (van Zandvoort et al., 2009). Participation in the weight management programmes often increased eating-related knowledge and afforded participants the skills to self-monitor their eating habits. Participants who acquired such knowledge and skills were then able to achieve their target weight loss (Cioffi, 2002).

Many studies reported improvements in physical and psychosocial functioning that were not necessarily linked to weight loss, such as improved mobility (Jones et al., 2007), mood (Jones et al., 2007), self-acceptance (van Zandvoort et al., 2009), and relationships with others (Jones et al., 2007). For fourteen overweight and obese lesbians, the weight management programme afforded participants a sense of belongingness which was described as a benefit irrespective of weight loss (Fogel et al., 2009). Weight management interventions that highlight the physical and psychosocial benefits of weight loss may encourage participants to persist with weight management efforts.

2.3.1 Conceptual model of the factors related to people's weight management experiences

Figure 2 represents the relationships between the themes identified in this review. Six of the twelve third-order themes derived from the papers were grouped together as 'intra-individual' factors related to people's weight management experiences, four themes were grouped together as 'extra-individual' factors related to weight management experiences, and two themes related to people's experiences in the context of a weight management programme.

Figure 2 Factors perceived by overweight and obese people as relevant to weight management



2.4 Discussion

2.4.1 Summary of findings

Overweight and obese people’s experiences with weight management were influenced by intra- and extra-individual factors and by their evaluations of

their experiences in weight management interventions (see Figure 2). Various intra-individual factors may influence weight management, including self-perceptions and body image, health concerns related to excess weight, attributions for weight gain and the maintenance of excess weight, and expectations about weight management. For some younger females, negative self-perception was attributed to excess weight. Improving health as a motivation for managing weight was commonly described by overweight and obese participants in some studies. Unrealistic expectations and unhelpful beliefs may hinder weight management attempts, while realistic expectations and constructive beliefs could allow people to manage weight effectively.

Several extra-individual factors, including stigmatisation, sociocultural factors, and environmental factors, were also related to weight management. Stigmatising experiences negatively influenced weight management for some participants, while motivating some female participants to manage their weight. Sociocultural factors were a prominent theme in the papers and highlighted how people's community, home and work settings, and culture could facilitate or support weight management. For some people, the food culture was incompatible with weight management. Many uncontrollable environmental barriers were reported but reorganising one's surroundings to eliminate some environmental barriers (e.g. restricting the availability of unhealthy food) was described as facilitating weight management.

Our review suggests that the overweight and obese people included in the studies reviewed generally had positive attitudes towards the structure and content of weight management interventions, and relationships with health professionals and peers. Many physical and psychosocial benefits associated with participation in weight management programmes were reported. In one study of overweight and obese lesbians, the support received from the intervention was described as providing a sense of belongingness which was valued, regardless of whether they lost any weight. Nevertheless, in some other interventions a tension could be discerned between the need for structure provided by weight management programmes and participants' desire and need for autonomy.

2.4.2 Implications for weight management

The themes identified have implications for improving current interventions for weight management for overweight and obese adults. Assessing overweight and obese people's weight management-related expectations may help identify unrealistic expectations, in order to prevent disappointment and negative attitudes towards weight management and themselves. It may be necessary to challenge unrealistic expectations about weight management and unhelpful beliefs regarding the reasons for weight gain and maintenance of obesity in order to provide a convincing rationale that the adoption of healthy dietary and physical activity behaviours can lead to successful weight management.

An ideal intervention may draw on support from peers to create a positive and encouraging environment, while health professionals can provide a valuable source of personalised advice and a structured environment for successful weight management. However, interventions also need to foster autonomous individuals who will be able to recognise and make use of available internal and external facilitators, and to plan for dealing with environmental and psychological barriers to maintain weight when support from the intervention is unavailable.

Overweight and obese people who stop engaging in weight management behaviours after some weight loss are likely to regain weight and this experience may negatively affect future attempts to lose weight (Elfhag & Rössner, 2005). Weight management interventions that highlight the physical and psychosocial benefits of weight management, irrespective of weight loss, may encourage participants to persist with weight management efforts. It may also be helpful for interventions to help overweight and obese people deal with pressure from others to manage weight.

Interventions can help people reorganise their lifestyle to achieve weight management. Successful weight management requires overweight and obese individuals to make behavioural, psychosocial and environmental changes that they can maintain in the long-term (Shaw et al., 2005). Weight management interventions can be useful for providing overweight and obese individuals with the knowledge and skills for managing weight and may also address psychological issues that may hinder weight management; however, it is unlikely that environmental and sociocultural barriers can be addressed by

weight management interventions alone. Therefore, changes are needed at the sociocultural level to establish safe and supportive environments that encourage overweight and obese people to modify their lifestyle in ways that will lead to successful weight management.

2.4.3 Limitations of the synthesis

It is unclear whether the findings from this review are applicable to contexts other than those included in the synthesis, i.e. mainly female Caucasian adults from general population samples participating in various weight management programmes. Overweight and obese men were seriously under-represented, and it is clear that more research into male experiences of weight management is urgently needed. Moreover, the meta-ethnography included studies only from Western societies, which limits the transferability of findings to other societies.

An inevitable limitation of the review is that in the studies reviewed the samples were self-selected, and may have over-represented the views of people who attended and had positive experiences in the weight management programmes. People who dropped out of the programmes and/or had negative weight management experiences may have had different views from those who volunteered for an interview or focus group.

As with any qualitative work, the meta-ethnography cannot demonstrate causal relationships between the hindering and facilitating factors and weight management. Participants' perceptions of factors influencing the success of weight management efforts may not always be accurate, and experimental methods are required to conclusively test whether each factor impacts on intervention effectiveness. A meta-ethnography is interpretive by nature and offers one possible interpretation of overweight and obese people's views and experiences with weight management and weight management programmes.

Traditionally, syntheses using meta-ethnography would present an interpretative analysis of the selected papers, in this case, to build a theoretical model of overweight and obese people's experiences of weight management. The aim of this meta-ethnography was to inform practice by illustrating

practical rather than theoretical issues that may be important in overweight and obese people's weight management attempts. Furthermore, the majority of the selected papers, with the exception of Johnson (1990), were descriptive studies aiming to inform practice; these studies were inherently inappropriate for theory building on overweight and obese people's weight management experiences.

2.4.4 Conclusion

Overweight and obese people's experiences with weight management need to be comprehensively understood in order to improve current recommendations and interventions to support people in their weight management efforts. To my knowledge, this is the first systematic review and meta-synthesis of published qualitative studies of overweight and obese adults' perceived barriers and facilitators to weight management, in and out of the context of diverse behavioural weight management programmes. By synthesising a large number of studies it was possible to build up a more complete overview of potentially relevant factors, than could be obtained from the findings from each of the individual studies.

The themes derived in this study of the factors perceived by overweight and obese people as relevant to weight management are consistent with findings from quantitative studies. Many of the psychological facilitators and barriers to weight management described in this review have also been identified in observational quantitative research into factors predicting weight management and weight regain (Byrne, Cooper, & Fairburn, 2004; Elfhag & Rössner, 2005; Teixeira, Going, Sardinha, & Lohman, 2005; Wing & Phelan, 2005). Since observational research can only provide suggestive and not conclusive evidence of the causal role of such factors (Teixeira et al., 2005), the convergence of qualitative evidence provides useful triangulation and corroboration of the probable role of these factors. Our overview of the qualitative research can also provide an elaboration of these factors, which reveals some interesting and potentially important complexities and dilemmas. For example, the negative stigmatizing consequences of obesity have been well established by quantitative research (Puhl & Heuer, 2009), but our review

suggests that stigmatizing experiences may also motivate some people to lose weight. A particularly interesting finding from the qualitative literature was the tension between participants' desire and need for the structure and social support provided by weight management interventions and the risks this posed in terms of loss of autonomy and dependence on the programme; finding the right balance between support and autonomy may be important for helping people to maintain weight loss independently in the longer term (Mann et al., 2007).

The findings of this synthesis complement and build on quantitative reviews that have examined psychosocial factors associated with weight management in overweight and obese adults (Byrne et al., 2004; Elfhag & Rössner, 2005) by identifying and explaining facilitators and barriers to weight management from the viewpoint of overweight and obese people. Interventions that address all of the modifiable factors identified in this review are likely to appear credible to participants and will engage with the intra- and extra-individual factors that they perceive as affecting their weight management efforts.

3. Determining whether there is scope to introduce a web-based weight loss intervention for overweight and obese Royal Navy personnel: a survey

3.1 Introduction

Chapter 2 presented the factors overweight and obese adults in the general population perceive as relevant to managing weight and engaging with behavioural weight loss programmes. However, the systematic review did not include any studies that explored the views and experiences of overweight and obese people from military samples. The purpose of this chapter was first to establish whether there was scope in the Royal Navy (RN) to introduce a web-based weight loss programme for overweight and obese personnel and, second, to contextualise the findings from subsequent studies (chapter 4, 5, and 7). This chapter presents the findings from a brief survey that was nested within the longitudinal Naval Service cohort study of occupational stress that ran through 2007 to 2011 (Bridger, 2008).

The first phase of the longitudinal Naval Service cohort study highlighted the problem of overweight and obese personnel in the RN (Kilminster et al., 2008). This study found that in a sample of 2576 RN personnel, according to participants' self-reported Body Mass Index (BMI), the proportions of overweight and obese personnel were 42% ($N = 1006$) and 13% ($N = 321$), respectively (Kilminster et al., 2008). It was noted that the prevalence of overweight and obesity were likely to be an underestimate as previous studies have reported a tendency for people to overestimate their height and underestimate their weight, which would result in a lower BMI [BMI = (Body mass in Kilograms) / (Height in Meters x Height in Meters)] (Spencer, Appleby, Davey, & Key, 2002). Findings from the first phase of the survey led to the conception of a collaborative project between the RN's Department of Naval Physical Development (DNPD) and the University of Southampton to modify and implement a web-based weight loss intervention for overweight and obese RN personnel.

For the current study, items were developed for addition to the 2011 version of the longitudinal Naval Service cohort study. Items were constructed to assess RN personnel's desire and perceived behavioural control (PBC) to lose weight, belief about the effectiveness of using a web-based weight loss programme, and PBC to use a web-based weight loss programme, drawing on the Theory of Planned Behaviour (TPB). The TPB constructs have been found to reliably predict health behaviours, including the adoption of a healthier diet and increasing physical activity (Armitage & Conner, 2001; McEachan, Conner, Taylor, & Lawton, 2011; Schulze & Whittmann, 2003). Demographic variables including gender, age, rank, and self-reported height, weight, and waist circumference data were used to examine potential differences between sub-groups of RN personnel's receptiveness to use a web-based weight loss programme. The next section provides an explanation of the major limitations during the construction of the items for this study. The rationale behind assessing RN personnel's desire and PBC to lose weight, belief about the effectiveness of using a weight loss website, and PBC to use a weight loss website are then presented. Lastly, the aims of this chapter are stated.

3.1.1 Constraints of the survey

The principal investigator of the parent study was involved in the project presented in this thesis. During the conception of this project, the initial research proposal consisted of four studies (chapter 2, 4, 5 & 7) for modifying and evaluating the feasibility of a web-based weight loss intervention for the RN. The primary investigator presented me with the opportunity to include up to four items in the Naval Service's occupational stress survey at the start of the PhD project in October 2010. There were major time and space constraints related to the inclusion of the additional items in this survey. The questionnaire items were developed to assess RN personnel's desire and PBC to lose weight, belief about the effectiveness of using a weight loss website, and PBC to use a web-based weight loss intervention, based on the TPB (section 3.3 for more detail) (Ajzen, 1991). As the parent survey already included a battery of questionnaires, the primary investigator of the survey study suggested that a maximum of four additional items would be acceptable to include in the survey, as this would not increase response burden on

participants. The four items that were included in the survey were constructed in a month and went through two revisions following discussion with my supervisor. Four items were included within the larger questionnaire to examine RN personnel's a) desire to lose weight, b) perceived behavioural control in losing weight, c) belief about the effectiveness of using a weight loss website, and d) confidence in using a weight loss website. The aim was that responses to these items would provide information as to whether there was scope in the RN for introducing a web-based weight loss intervention for overweight and obese personnel.

3.1.2 Rationale for inclusion of items

There is a lack of research about the user profile of weight loss websites in the general population (Saperstein et al., 2007). This is also the case in the RN. This study aimed to identify demographic and psychosocial factors that would provide insight as to which groups of overweight and obese RN personnel are more likely to engage with a weight loss website. As target users of the web-based weight loss programme, overweight and obese RN personnel are in the best position to provide information about their desire and PBC to lose weight, belief about the effectiveness of using a website for weight loss, and their PBC to use a website for weight loss.

The TPB is a psychological model of behaviour change that was used for providing a framework for the construction of the questionnaire items (Ajzen, 1991). According to the TPB, intentions and PBC are the most immediate determinants of one's behaviour. Despite the conceptual differences between 'intention' and 'desire' to engage in a particular behaviour (in this case, to lose weight), research suggests that there is response consistency between questionnaire items worded to assess intentions (e.g. I intend to) and those worded to assess desires (e.g. I want to) (Armitage & Conner, 2001). For the purposes of this chapter, desire to lose weight is used as a proxy for assessing intention to lose weight, though the conceptual differences between intentions and desires are acknowledged.

Assessing whether overweight and obese RN personnel desire to lose weight is important for determining the uptake of resources that may be

provided for supporting weight loss. On the other hand, a lack of desire to lose weight among overweight and obese personnel may suggest that interventions that aim to motivate these personnel to lose weight may be necessary, not only for improving individuals' health but also for improving the operational capabilities of the RN. Information about the sample's PBC to lose weight may shed light as to whether there is room for improving some participants' confidence in their ability to lose weight. Personnel, who report confidence in their ability to lose weight, if they wanted to, may not perceive any benefit from a web-based resource to support their weight loss attempts.

Since it was not possible to give participants any information about the content of the website, their beliefs about the effectiveness of using a weight loss website were measured, instead of assessing their intention to use a weight loss website. Personnel's PBC to use a weight loss website was also of interest as responses to this item would provide insight about their perceived confidence in using a weight loss website. By measuring participants' belief about the effectiveness of using a web-based weight loss programme, the aim was to identify potential sub-groups among RN personnel who may be more receptive to use a website to support their weight loss attempt. Participants' PBC to use a web-based weight loss programme was measured to shed light on potential users' confidence in their ability to use a weight loss website. Taken together, these findings may provide insight for targeting potential users of the website and/or why the website may not be well received by this sample.

3.1.3 Rationale for chosen demographic variables

The findings from the 2008 study revealed differences in the prevalence rates of overweight and obesity based on age, gender, and rank (Bridger, 2008). Obesity was found to be more prevalent among male RN personnel compared to female personnel, even when differences in the proportion of male and female personnel were controlled for. In terms of age, the highest prevalence of obesity was reported among RN personnel older than 35 years, followed by personnel under the age of 25. The highest prevalence of overweight personnel was in the 25-34 age group when compared to personnel who were younger or older than this age group category. The prevalence of obesity was

higher among ratings (junior personnel) compared to officers (senior personnel). Based on these findings, demographic variables including age, gender, and rank were collected and included in the analyses of this study.

3.2 Aims

The primary aim of this chapter was first to examine RN personnel's desire and PBC to lose weight, belief about the effectiveness of using a web-based weight loss programme, and PBC to use a web-based weight loss programme in order to determine whether there was scope in the RN to introduce a website to support overweight and obese RN personnel in their weight loss attempts. The second aim of this chapter was to contextualise findings from subsequent studies (chapter 4, 5, and 7) that were limited by smaller samples. This survey complements the findings of the interview and thinkaloud studies (chapter 4 & 5) and the feasibility study (chapter 7) by allowing triangulation of qualitative and quantitative findings. The survey study provides information on the proportion of RN personnel who may be interested in using a weight loss website from a large generalisable sample, while the subsequent studies provide deeper insight of purposive samples of overweight and obese RN personnel's weight management experiences, perceptions and behaviours.

3.3 Methods

3.3.1 Participants

A random and stratified sample of 3105 males (10% of the total male population in the RN) and 1846 females (60% of the total female population in the RN) were selected from a total of 34130 RN personnel in January 2007 and were mailed the original Naval Services occupational stress survey. There were no selection criteria for participation. Participants who responded to the 2007 survey and who were still serving in the RN in 2011 were re-sent the questionnaire pack ($N = 1859$) with additional items that were included for the

purposes of this project (i.e. modifying a web-based weight loss intervention for overweight and obese RN personnel).

The response rate to this cross-sectional survey was 67% ($n = 1241$); 65% for males and 69% for females. Responses of pregnant personnel ($n = 35$), personnel with missing data for the General Health Questionnaire-12 (GHQ-12; $n = 51$) (Goldberg & Williams, 1988), and of Royal Marines ($n = 91$) were excluded from analyses, resulting in a sample of 1064. Pregnant personnel and Royal Marines were excluded due to differences in their physical training compared to RN personnel. Ideally, participants with missing GHQ-12 data would have been included in the analyses for the purpose of this chapter. However, two independent researchers from the Institute of Naval Medicine (INM) cleaned the data set prior to making the data set available to me. All participants with a low BMI (< 18) had reported waist circumference data and it was possible to calculate their level of risk according to the NICE risk zone model. Participants at risk of being underweight were excluded ($n = 34$, 3%). The findings reported in the remainder of this chapter are based on a sample of 1030 RN personnel.

3.3.2 Measures

Most of the pre-existing measures included in the survey pack were not relevant for the purposes of this study and therefore details of these measures are not provided here (for further details see Bridger, 2008). Some participant characteristics that were collected in the questionnaire that were of interest are listed below:

- a. Height (metres and centimetres)
- b. Weight (in kilograms)
- c. Waist circumference (centimetres)
- d. Gender
- e. Rank
- f. Age

Height, weight, and waist circumference data were collected in order to categorise participants into no risk, increased risk, and high risk of developing obesity-related health problems (hypertension, Type II diabetes, and musculoskeletal disorders) according to the NICE guidelines risk zone model

(National Institute for Health and Clinical Excellence (NICE), 2006). This categorisation could have been more informative than relying on BMI data alone, given that the RN population may be more muscular due to differences in physical training compared to the general population. However, as 69% of female and 41% of male waist circumference data were missing, BMI data were used for categorising participants into *healthy weight*, *overweight*, and *obese* categories. This categorisation was done in order to test whether there were differences in terms of demographic characteristics and psychological factors (desire, PBC, and belief) between these groups. As the main focus of this PhD project was to test the feasibility of implementing a web-based weight loss programme to support overweight and obese RN personnel, this categorisation was useful for identifying trends within these groups.

The demographic characteristics were selected in order to identify which demographic variables, if any, were associated with wanting to lose weight and using a weight loss website. Identifying subgroups among high risk RN personnel who are interested in using the website may lead to targeting specific subgroups in subsequent studies, as they may be more receptive to using a web-based weight loss intervention.

Constructing the questionnaire items

The TPB was used as a guide for the construction of the new questionnaire items to assess RN personnel's desire and PBC (confidence in one's ability) to lose weight, belief about the effectiveness of using a web-based weight loss programme, and PBC to use a web-based weight loss programme (Ajzen, 1991). Although the TPB provides a framework from which it was possible to generate items of interest, it was not possible to construct items that adhere to the recommendations of constructing items that assess the TPB constructs due to limitations described above (section 3.1.1) (Fishbein & Ajzen, 2010; Francis et al., 2004).

The TPB assumes that people are rational decision makers, and the constructs of the TPB are expected to predict volitional behaviour. Reviews have shown that the TPB constructs reliably predict health behaviours, including the adoption of a healthier diet and increasing physical activity

(Armitage & Conner, 2001; McEachan et al., 2011; Schulze & Whittmann, 2003). The TPB posits that intentions and PBC may directly predict volitional behaviour. Intentions can be defined as one's willingness to engage in a particular behaviour. Attitudes and subjective norms' influences on behaviour are mediated through intentions. PBC may also influence behaviour by influencing one's intentions.

In the context of losing weight, it would have been desirable to assess the indirect influence of attitudes and subjective norms as well; however, due to limitations with space in the survey, it was decided to assess the influence of constructs that are predicted to have a direct effect on behaviour, according to the TPB model. Overweight and obese participants may respond in a socially desirable way to a statement relating to their intentions to lose weight, therefore operationalizing PBC is expected to provide a more genuine picture of overweight and obese RN personnel's likelihood of using a website to support their weight loss.

The questionnaire items developed for this study would have ideally been constructed in accordance with the instructions for developing TPB questionnaire items, that is, the behaviour of interest should be defined in terms of the target, action, context, and time elements (Fishbein & Ajzen, 2010). 'Losing weight' is not a clearly defined behaviour, however, given the numerous behaviours one may engage in to achieve weight loss, it would not have been feasible to develop a series of clearly defined behavioural items given the limited space that was made available in the survey. It can be argued that 'intentions to diet' may have been a better defined behaviour. However, given the differences in men's perceptions of dieting, some participants may have not intended to diet but may have intended to lose weight by increasing levels of physical activity, and not necessarily through making dietary changes (De Souza & Ciclitira, 2005). The idea of losing weight through increasing physical activity among male participants also emerged in chapters 4 and 5.

Participants were asked to rate how strongly they agreed or disagreed with the statements below using a 7-point Likert scale ranging from "1" (strongly disagree) to "7" (strongly agree). Participants were instructed to rate statements 2, 3, and 4, if they rated they agreed (a rating of at least 4) with the first statement:

1. I want to lose weight
2. I am confident I could lose weight, if I wanted to
3. Using an interactive website that provided weekly personalised advice on weight loss strategies would help me lose weight
4. I am confident that I could use an interactive website that provided weekly personalised advice on weight loss, if I wanted to

Participants' motivation to lose weight could have been assessed in various ways. For example, intention to lose weight could have been assessed with the following item, 'I intend to lose weight', whilst duty to lose weight may have been measured by the item, 'I ought to lose weight'. In fact, it has been suggested that intention to engage in a particular behaviour could be measured using three individual items that are then combined in a single variable, i.e. 'I expect to', 'I want to', and 'I intend to' (Francis et al., 2004). There are conceptual differences between these three wordings, however, a review by Armitage and Conner (2001) suggests there is considerable response consistency among these items. Given the limitations of the number of items that could be included in the survey, it was deemed acceptable to include only one of these wording formats to assess desire to lose weight, which is used as a proxy for assessing intention to lose weight. For item 1, 'I want to lose weight' was chosen to measure participants' desire to lose weight because 'I intend to lose weight' may have excluded some personnel who wanted to lose weight but who had not yet found a suitable approach to lose weight. Items 2 and 4 aimed to assess perceived behavioural control to lose weight and to use a weight loss website. The wording of these items was chosen to measure self-efficacy ('I am confident I could') and to hold motivation constant ('if I wanted to') (Ajzen, 2002; Rhodes, Blanchard, & Matheson, 2006). Item 3 aimed to measure behavioural beliefs about the effectiveness of using a weight loss website.

3.3.3 Procedure

An amendment to the original research protocol was submitted with the inclusion of the additional items in the parent study. The amendments were

approved by the Ministry of Defence Research Ethics Committee. The INM mailed participants consent forms and the questionnaire packs in January 2011, with a stamped and addressed envelope for participants to return their questionnaires. Survey packs were received by researchers at the INM over the course of six months. Data entry was carried out and checked for accuracy by researchers at the INM. Following data entry, it became apparent that a majority of the sample had responded to all four of the additional items, regardless of whether they had agreed or disagreed with the first item. Initially, data analyses were to focus on responses from overweight and obese participants, however, sufficient responses to the 4-items from healthy weight participants made it possible to conduct between group comparisons of participants' desire and PBC to lose weight, belief about the effectiveness of using a web-based weight loss programme, and PBC to use a web-based weight loss programme.

3.3.4 Data Analyses

Statistical analyses were carried out using Predictive Analysis Software version 18.0 (SPSS: An IBM Company, Chicago, IL, USA). The dataset was checked for outliers and any identified were removed by two independent researchers at the INM. A BMI over 42 was deemed erroneous, which resulted in eight personnel's BMI data being excluded from analyses. All but 2 of the participants included in the analyses responded to the first item, 'I want to lose weight' ($n = 1028$). Missing data were not replaced. Data were explored to ensure parametric assumptions were met. Scatter plots and histograms were checked to ensure normal distribution of the data.

In this study and in the thesis, overweight and obese RN personnel were the main population of interest. Therefore, participants were categorised into three groups based on their weight status, which was determined by participants' self-reported BMI. Participants with a self-reported BMI between 18 and 24.9 fell in the *healthy weight* category, those with a BMI between 25 and 29.9 comprised the *overweight* category, and participants' with a BMI of 30 or more made up the *obese* category.

Descriptive analyses were conducted on the dataset to identify the proportion of participants whose BMI fell in the healthy weight, overweight, and obese categories. Pearson's correlation tests were carried out on all variables to examine the relationships between demographic and psychological variables, i.e. participants' desire and PBC to lose weight, belief about the effectiveness of using a weight loss website, and PBC to use a weight loss website based on their gender and rank. Findings from the 2008 survey suggested there were differences in the proportion of overweight and obese personnel based on their gender and rank; therefore, differences in participants' responses to the survey items were examined for these two characteristics. Potential differences in participants' responses, based on their gender and rank, may have implications for identifying subgroups within the sample that may be more likely to use a website for supporting their weight loss attempts.

One-way ANOVAs were conducted to test differences in the mean responses to items between the three weight groups (healthy weight; overweight; obese). The following hypotheses were tested in line with the aims of this study:

- Overweight and obese participants will report stronger desire to lose weight compared to the desire to lose weight reported by healthy weight participants.
- Healthy weight participants will report stronger PBC to lose weight compared to overweight and obese participants' reported PBC.
- Overweight and obese participants will report stronger beliefs about the effectiveness of using a web-based weight loss programme to lose weight compared to beliefs rated by healthy weight participants.
- All participants, regardless of their weight status, will report strong PBC for using a web-based weight loss programme to lose weight.

3.4 Results

Based on data from 1030 RN personnel (female = 410, 40%; male = 620, 60%), the majority of participants were ratings ($n = 606$, 59%; officers = 421, 41%), and the mean age of the sample was 39 ($SD = 7.32$; range = 22 - 58). The

mean BMI for the sample was 26.44 ($SD = 3.72$). Most participants' ($n = 462$, 45%) BMI fell in the overweight category ($BMI = 25 - 29.99$), with 38% ($n = 394$) of participants self-reporting a healthy weight ($BMI = 18.50 - 24.99$), and 16% ($n = 166$) of personnel's BMIs classified as obese ($BMI \geq 30$). This finding revealed that 61% of the sample had excess weight. Age was split into three groups (<25; 25-34; >35) in accordance with the way age was categorised in the 2008 report (Kilminster et al., 2008). Table 5 summarises the demographic characteristics of the sample according to participants' weight status. Table 6 presents correlations between demographic variables and participants' desire and PBC to lose weight, belief about the effectiveness of using a weight loss website, and PBC to use a weight loss website.

Table 5 Sample characteristics categorised by participants' weight status and the proportion of participants who were in agreement with the survey items

Characteristics	Healthy weight		Overweight		Obese	
	<i>n</i>	%	<i>N</i>	%	<i>n</i>	%
Gender						
Female	214	21	143	14	52	5
Male	180	18	319	31	114	11
Rank						
Rating	208	20	271	26.5	124	12
Officer	186	18	191	19	42	4
Age						
< 25	3	0.3	5	1	0	0
25 - 34	146	15	116	12	31	3
> 35	234	23	334	33	130	13
Desire to lose weight	167/396	42	363/462	79	156/168	93
PBC† to lose weight	227/239	95	371/413	90	150/166	90
Effectiveness of using a website	138/239	58	242/414	58	113/166	68
PBC† to use a website	185/240	77	323/413	78	135/166	81

†PBC = Perceived behavioural control.

Table 6 Pearson's correlations between gender, rank, age, BMI, and psychological variables

Variable	2	3	4	5	6	7	8
1. Age	.18*	.33*	.17*	.05	-.02	-.09*	-.04
2. BMI	-	.20*	-.14*	.50*	-.11*	.11*	.05
3. Gender		-	.05	-.11*	.01	-.07*	-.02*
4. Rank			-	.02	-.09*	0	.04
5. Desire to lose weight				-	.10*	.28*	.20*
6. PBC† to lose weight					-	.01	.21*
7. Belief about the effectiveness of using a weight loss website						-	.52*
8. PBC† to use a weight loss website							-

Note: *Correlation is significant at $p < .05$; †PBC = Perceived behavioural control

A rating of 4 or more indicated that the participants agreed with the statement “I want to lose weight”, while a rating of 3 or less indicated that participants did not want to lose weight. The majority of participants ($n = 686$, 67%) reported agreement, to some degree, with the statement “I want to lose weight”, that aimed to measure participants' desire to lose weight. This item was used as a proxy for assessing participants' intention to lose weight. Participants' PBC to lose weight was generally high, with only 70 (8%) participants reporting a lack of confidence to lose weight. Obese participants (68%) were significantly more likely to report that using a website to achieve weight loss may be effective, compared to healthy weight and overweight participants' responses. Regardless of weight status, the majority of participants (78%) reported confidence in their ability to use a website to lose weight, suggesting that most RN personnel believed they would be able to successfully engage with a web-based weight loss programme. Alternatively, this finding may also suggest that participants may feel confident in their ability to lose weight independently, without the input from other people.

Correlations revealed that there was a significant positive correlation between age and BMI, suggesting that on average older participants were more likely to have a higher BMI. On average, male participants were more likely to be officers and older, compared to female participants. The correlations also suggest that younger participants, on average, were more likely to report belief about the effectiveness of using a weight loss website for weight loss, compared to older participants. Male participants, compared to female participants, were more likely to report having excess weight. Ratings were more likely than officers to report having excess weight. Participants with a higher BMI, on average, were more likely to agree with the statement “I want to lose weight”, and were less likely to be confident in their ability to lose weight. Participants were more likely to report believing that a web-based weight loss programme may be effective for weight loss if they had a higher BMI.

Participants’ desire to lose weight positively correlated with the three other items measured in the survey, suggesting that participants reporting desire to lose weight were, on average, more likely to report being confident to lose weight, more likely to agree that using a weight loss website would be effective for weight loss, and more likely to report being confident to use a weight loss website. Participants who reported confidence in their ability to lose weight, on average, were more likely to report confidence in their ability to use a weight loss website. Participants’ belief about the effectiveness of using a weight loss website significantly correlated with their confidence in their ability to use a weight loss website, suggesting that participants who believed using a weight loss website would be effective for weight loss, on average, were more likely to report they would be able to use a weight loss website. Additionally, participants who reported being able to use a weight loss website may have been more likely to believe that using a weight loss website would be effective for weight loss.

The target sample of interest in this thesis was overweight and obese RN personnel. This group was of particular interest as the aim of the overall thesis was to support personnel with excess weight in their attempts to lose weight by implementing a web-based weight loss programme. Therefore, participants’ responses to the items were analysed based on their weight status. Table 7 summarises the means and standard deviations of participants’ desire and PBC to lose weight, beliefs about the effectiveness of using a weight

loss website, and PBC to use a weight loss website, according to participants' weight status.

Table 7 Healthy weight, overweight and obese participants' means and standard deviations of desire and PBC to lose weight, belief about the effectiveness of using a weight loss website, and PBC to use a weight loss website

Variable	Healthy weight			Overweight			Obese		
	<i>n</i>	<i>x</i>	<i>SD</i>	<i>n</i>	<i>x</i>	<i>SD</i>	<i>n</i>	<i>X</i>	<i>SD</i>
Desire to lose weight	396	3.41	1.88	462	5.03	1.67	168	5.69	1.46
PBC+ to lose weight	239	5.85	1.19	413	5.52	1.41	166	5.42	1.39
Effectiveness of using a website	239	3.68	1.74	414	3.85	1.88	166	4.19	2.00
PBC+ to use a website	240	4.77	1.88	413	4.90	1.82	166	5.06	1.84

The greater the mean response (\bar{x} = ranging from 1-7), the more strongly participants agreed with the statement; +PBC = Perceived behavioural control.

Desire to lose weight. Obese participants reported greater desire to lose weight compared to overweight participants, while healthy weight participants were less likely to report a desire to lose weight. A one-way ANOVA between participants in the different weight categories revealed that these mean group differences in desire to lose weight were statistically significant, ($F(2, 1025) = 89.60, p < .001$).

Perceived behavioural control to lose weight. Healthy weight participants were more likely to report greater agreement with the item measuring PBC to lose weight compared to overweight and obese participants. The mean differences in participants' PBC responses were statistically significant, ($F(2, 815) = 6.20, p$

< .01). These findings suggest that overweight and obese RN personnel may feel less equipped with the knowledge and skill set required to lose weight, compared to healthy weight participants.

Beliefs about the effectiveness of using a weight loss website. Obese participants were more likely to report that using a weight loss website would help them lose weight compared to overweight and healthy weight participants. Mean group differences for beliefs about the effectiveness of using a weight loss website were statistically significant, ($F(2, 818) = 3.67, p < .05$).

Perceived behavioural control to use a weight loss website. Obese participants were more likely to report greater PBC to use a weight loss website compared to overweight and healthy weight participants. However, the between group mean differences were not found to be statistically significant ($F(2, 818) = 1.18, p = .31$), suggesting that participants across all weight groups felt equally confident about using a weight loss website.

3.5 Discussion

This chapter's main aim was to determine whether there was scope in the RN to introduce a weight loss website to support overweight and obese personnel in their efforts to lose weight. The items in the survey set out to measure RN personnel's desire and PBC to lose weight, beliefs about the effectiveness of using a weight loss website, and PBC to use a weight loss website. Participants' responses to the four items were used for assessing the proportion of overweight and obese RN personnel that may be interested in using a website to support their efforts to lose weight.

This study originally set out to examine overweight and obese participants' desire and PBC to lose weight, beliefs about the effectiveness of using a weight loss website, and PBC to use a weight loss website. Interestingly, over 40% of participants with a healthy BMI rated that they

wanted to lose weight. The weight loss website is designed for use by overweight and obese personnel and therefore may be less useful to personnel with a healthy weight. However, as there were sufficient responses to the items from healthy weight participants, it was possible to compare mean ratings of beliefs about the effectiveness of using a weight loss website, and PBC to lose weight and to use a weight loss website across the three weight status groups (healthy weight; overweight; obese). Differences and similarities between mean responses of overweight and obese personnel with healthy weight personnel were examined.

The majority of the sample agreed with the statement “I want to lose weight”, suggesting that most participants desired to lose weight. There is evidence that suggests desire to lose weight may be used as a proxy for assessing intentions to lose weight, which may predict weight loss behaviour (Armitage & Conner, 2001). However, caution is needed when interpreting this result as participants may have been responding in a socially desirable way, which would lead to an overestimate in the proportion of personnel intending to lose weight.

Findings from the 2008 report suggest that younger male personnel are more likely to be at an increased risk for developing obesity-related health problems (Kilminster et al., 2008). However, this finding was not replicated in this survey. The sample of this study was limited to the sample recruited in 2007. A participant who was 21 in 2007 (the first phase of the survey) would have been grouped in the 25 – 34 category in 2011. This may be one explanation for the limited responses from younger personnel to the follow-up survey. This is concerning as it may suggest that the views of a potentially high risk group for developing obesity-related conditions may have been underrepresented.

Participants whose BMI fell in the overweight or obese categories were less likely to agree with the statement “I am confident I could lose weight, if I wanted to” compared to participants who were classified as having a healthy weight. This suggests that some overweight and obese participants may welcome support from a weight loss website in order to achieve a healthy weight. Obese participants compared to overweight participants, on average, reported stronger agreement that a website would be helpful for weight loss,

which suggests that the website may be better received by obese participants. For overweight participants, alternative resources of support for losing weight could be explored. Due to the limitations of this study, it was not possible to provide any detail about the weight loss website in terms of the structure and content, which may have made it difficult for participants to express their opinion of a website they had no information about.

In an attempt to identify the potential user profile of the weight loss website, demographic factors were analysed to test whether they were associated with increased interest to lose weight and to use a weight loss website. Obese personnel and female personnel appeared to be particularly interested in using a weight loss website compared to other subgroups based on their responses to the four items. This finding is in line with previous studies that have found that women are more likely than men to take part in behavioural weight loss programmes (chapter 2) (Garip & Yardley, 2011).

The second aim of this chapter was to contextualise findings from subsequent studies. Although overweight and obese participants reported less confidence in their ability to lose weight compared to healthy weight participants, overweight and obese participants' reported levels of confidence in their ability to lose weight were still relatively high on average. This suggests that participants, regardless of their weight status, may feel they have some degree of confidence in their ability to lose weight, if they wanted. A lack of use of the website could be explained by participants not perceiving a need for the website for their weight loss attempts. However, confidence in one's ability to lose weight is associated with weight loss and weight maintenance, and therefore may be related to user's adherence to the advice provided in the weight loss website (Elfhag & Rössner, 2005).

3.5.1 Strengths and limitations

There are several limitations of this study. The constraints related to the number of items that could be included in the survey have already been discussed. The four items developed were loosely based on the TPB; however it was not possible to measure the items' reliability. Ideally, the items would have been developed in accordance with the recommendations for devising TPB

items, and they would have been validated in a sample of RN personnel. The single item measures included in the survey may not have captured the construct they were intended to measure and may have lacked construct validity. Self-presentational biases may have been operating with overweight and obese personnel responding in a socially desirable way (Gaes, Kalle, & Tedeschi, 1978), inflating the proportion of personnel wanting to lose weight and potentially being interested in using a weight loss website.

The majority of the sample self-reported a BMI that was classified as overweight or obese, with only 38% of the sample self-reporting a BMI that fell within 18 – 24.99, which is considered healthy. It is worth noting that some personnel may maintain higher levels of muscle mass, given that physically demanding jobs are not uncommon in the RN, which would result in a higher BMI but not necessarily indicating that the person is at risk for developing obesity-related health problems. A more accurate way of identifying the proportion of RN personnel at risk of developing obesity-related health problems would have been to include waist circumference measurements. BMI and waist circumference data together would have distinguished participants with a higher BMI due to muscle mass rather than body fat. However, due to high rates of missing self-reported waist circumference data, it was not possible to categorise weight status more robustly by relying on BMI and waist circumference data. Categorising participants into different weight status groups was solely based on participants' self-reported BMI.

Despite these limitations, data were gathered from a large sample of RN personnel, which was useful for providing preliminary insight into RN personnel's desire (intentions) and PBC to lose weight, beliefs about the effectiveness of using a weight loss website, and PBC to use a weight loss website.

3.5.2 Future research

Future research would benefit from using reliable and validated items to assess RN personnel's attitudes, subjective norms, intentions and perceived behavioural control to lose weight and to use a weight loss website. Due to limitations with space in the survey it was not possible to include well specified

items, in line with recommendations for developing items to assess constructs of the TPB. In an attempt to minimise the influence of self-presentational biases, collecting objective data, such as website usage, may increase the accuracy of self-reported measures. Some subgroups, for instance personnel under the age of 25, were underrepresented in this sample. Future research could focus on potentially high risk groups for developing obesity-related conditions in order to identify whether they are receptive to web-based weight loss programmes.

3.5.3 Practical implications

The findings from this survey suggest there may be a niche in the RN for implementing a web-based weight loss intervention for overweight and obese personnel, with obese personnel and female personnel being most likely to be interested in engaging with the website. This suggests that whilst recruiting users for the intervention, it may be worth targeting these groups, as they may be more likely to engage and potentially benefit from the intervention.

Findings suggest that some subgroups showed less interest in using a website to support their weight loss. For some overweight and obese personnel, non-digital resources may be more suitable and acceptable for supporting their weight loss attempts. It is interesting that some overweight and obese participants reported no desire to lose weight, which has implications for their fitness to work in the RN. Interventions that aim to increase motivation to lose weight may be beneficial to overweight and obese RN personnel who are less motivated to lose weight. These findings suggest that the web-based weight loss intervention is not likely to be received equally by all participants with excess weight.

3.5.4 Conclusion

RN personnel generally desire to lose weight and perceive having control over losing weight. On average, obese participants were most likely to believe that a website could be effective for achieving weight loss, and most participants,

regardless of weight status, believed they would be able to use a weight loss website, if they wanted to. Obese personnel and female personnel appear to be particularly interested in using a weight loss website compared to other subgroups. The final chapter (chapter 8) will triangulate findings from this chapter and subsequent chapters to present a more coherent understanding of overweight and obese RN personnel's experiences, perceptions, and behaviours related to using a web-based weight loss intervention.

4. Overweight and obese Royal Navy personnel's experiences with weight management: a qualitative study

4.1 Introduction

Understanding the lifestyle and weight management experiences of overweight and obese Royal Navy (RN) personnel may uncover some of the factors that may be relevant to the maintenance of excess weight. Such information would be valuable for informing the modifications to an existing web-based weight loss programme, titled "Positive Online Weight Reduction" (POWeR), to ensure that the intervention is relevant and acceptable to overweight and obese RN personnel attempting to lose weight. As potential users of the intervention, overweight and obese RN personnel are in the best position to provide information about their lifestyles, experiences with weight management and their views towards using a web-based weight management intervention. Hence, it could be useful to conduct face-to-face semi-structured interviews with overweight and obese RN personnel. Indeed, the literature shows (Brown & Gould, 2011; Garip & Yardley, 2011) that interview studies are valuable for understanding people's views related to weight management.

A meta-ethnography which synthesised 17 qualitative studies of overweight and obese people's weight management experiences identified common themes that were relevant to people's weight management experiences in a variety of contexts (chapter 2). These themes may also be applicable to overweight and obese RN personnel; however, there are contextual differences in the naval and civilian environments which may result in different factors that influence weight management. For example, the naval environment provides meals for personnel who do not self-cater, and provides more opportunities to exercise and support for weight management for personnel than is the case for people in most civilian settings.

Despite the extensive literature on weight management experiences in civilian samples, the dietary and physical activity habits and weight management experiences of RN personnel have not been investigated. A

limitation of the majority of qualitative studies investigating people's weight management experiences is that female participants outnumber males (Garip & Yardley, 2011). This study can contribute to the understanding of weight management experiences of a predominantly male sample in the context of the RN.

4.1.1 Aims

This study aims to understand the dietary and physical activity habits and weight management experiences of overweight and obese RN personnel. Findings will be used to inform modifications to an existing web-based weight management intervention in order to maximise the relevance of the content of the intervention for overweight and obese RN personnel. Secondly, it will add a predominantly male account of weight management experiences to the literature. Additionally, this study will try to explain how even in an environment where support for weight management is readily available, weight management may not be achieved.

4.2 Methods

4.2.1 Recruitment

The study was advertised in three Royal Navy (RN) shore-based establishments, namely HMS NELSON, HMS SULTAN and HMS COLLINGWOOD, to recruit RN personnel who had a BMI of at least 25 and were concerned about their weight. Detailed information about the study setting has been provided in chapter 1. Posters describing the inclusion/exclusion criteria and nature of the study were placed on notice boards and circulated in daily orders in the naval establishments in Gosport, Portsmouth and Fareham, UK (Appendix C). The study was also advertised online on the naval network (www.Navy-net.co.uk) and on the RN's official Facebook page. Five RN personnel inquired about the study resulting from these advertisements and one participated in an interview. The four RN personnel who inquired about the study via the aforementioned routes were serving abroad during the time of data collection, and therefore it was not possible to arrange a face-to-face interview.

RN personnel with a BMI over 30 who were to receive details about their upcoming appointment at the Fitness and Anthropometry Clinic (Gosport, UK) were sent by post participant information sheets and an invitation to take part in the study. Of the six RN personnel who were sent invitations, none contacted the researcher. After a month of unsuccessfully attempts to recruit RN personnel by the aforementioned routes, physical training instructors at HMS NELSON, HMS COLLINGWOOD and HMS SULTAN were approached by the researcher, who informed them about the aims and structure of the study. Physical training instructors were asked to approach RN personnel who met the inclusion criteria and to purposively sample from various demographic groups, in terms of age, gender, living on or off base, years served in the RN, and weight management status. The involvement of physical training instructors in recruiting RN personnel proved fruitful. Twenty participants with diverse demographic backgrounds were recruited by physical training instructors. Two of the physical training instructors made prior arrangements with participants of a time and date for the interview and informed me about the arrangements. One physical training instructor gave interested RN personnel my contact details, and participants directly contacted me to make arrangements for an interview. Ethical approval was granted by the School of Psychology Ethics Committee at the University of Southampton and the Ministry of Defence Research and Ethics Committee.

4.2.2 Participants

Twenty one RN personnel (16 men; 5 women), with self-reported BMIs ranging from 26-34, took part in a face-to-face semi-structured interview. These participants were selected as they represented the target sample for which a weight management intervention was being developed. Participants were in various branches of the Royal Navy, including engineering, administration, band service, and catering services. Participants' ages ranged from 22 to 45. Recruitment terminated when no new codes or themes were derived from the latest interview transcripts, i.e. a saturation point was reached.

4.2.3 Design and data collection

Face-to-face semi-structured interviews, lasting between 15 and 50 minutes (median duration = 25 minutes), were conducted between February and May 2011 to understand participants' lifestyles and their experiences with weight management. The interviewer travelled to the three RN bases (HMS NELSON, HMS SULTAN and HMS COLLINGWOOD) to interview RN personnel. The locations of the interviews at the bases were arranged by physical training instructors. Participants were given sufficient time to read and ask questions about an information sheet (for them to keep) and a consent form, which they were given prior to the start of the interview (Appendix C). Prior to the start of the interview, the interviewer also verbally reiterated the aims of the interview, participants' rights, and that any information participants provided would be kept confidential. All interviews were conducted by me and were audio recorded with participants' consent.

An interview guide was used during the interviews. The interview guide was developed to gain insight about participants' day-to-day experiences in the RN, dietary and physical activity/exercise behaviours, experiences with weight management, and their views towards using a web-based weight management intervention. Box 1 shows a list of the main questions and prompts used to guide the interviews. Additional questions were asked depending on participants' responses to these questions. At the end of the interview, participants were given an optional form to provide their full name, date of birth, gender, ethnicity, marital status, self-reported anthropometric measurements (weight, height, waist circumference), medical grade, rank, how long they have served in the RN, and how long they have spent living onboard ships and in service accommodation (Appendix D). After a participant left the interview location, I made notes to accompany the transcripts. A research administrator, experienced in transcribing, transcribed the audio recordings verbatim.

Box 1 Interview guide

1. Could you tell me about what a typical day is like for you in the Royal Navy?
2. Could you tell me about what you normally eat and drink in a typical day?
3. What could you do if you wanted to eat a healthier diet?
4. Could you tell me about any physical activity you engage in?
5. What could you do if you wanted to be more physically active?
6. Could you tell me about your most recent experience with weight loss?
7. What support for weight loss do you have in the Royal Navy?
8. What are your views on using an interactive website that gives advice on maintaining healthy eating habits and engaging in regular physical activity?
9. What would make it more likely for you to use an interactive website that gives advice on maintaining healthy eating habits and engaging in regular physical activity?

4.2.4 Data analysis

Transcripts were analysed using an inductive thematic analysis approach to categorise the data (Braun & Clarke, 2006), using Nvivo 8.0 (QSR International Pty Ltd, 2009), a qualitative data analysis software package. The initial stages of analysis consisted of the researcher reading and re-reading their notes taken after the interview and the first four transcripts as they became available, while noting key concepts that were grounded in the data. Two sets of notes were kept throughout the coding process in the form of paper trails. I kept one set of notes to ensure transparency of the coding process, as well as to form a record of the development my interpretations of the codes, themes and the relationships between them. The purpose of the second set of notes was to inform modifications to an existing web-based weight loss intervention.

Line by line coding was undertaken on the first four transcripts. All text in the transcripts was coded that related to participants' dietary and physical activity habits, and their experiences with weight management. The initial codes were grounded in the data and participants' own words were used wherever possible. This stage of coding resulted in a preliminary list of 100 codes. The remaining transcripts were deductively coded using the preliminary

codes and were also explored to identify additional concepts that were relevant to the aims of the study but were not represented by the preliminary codes. Preliminary codes that were very similar were merged. The refined list consisted of 80 initial codes, i.e. lower level codes (Appendix E). A coding manual was developed defining each of the lower level codes. Lower level codes that were related were clustered together to form themes. Lower level codes mentioned by only one participant and that did not fit within a theme were excluded. Definitions and exclusions of each theme were included in the coding manual (Appendix F). Deriving themes was an iterative process, and resulted in 7 major themes and 21 sub-themes. The final stage of analysis involved examining how themes and sub-themes were inter-related.

4.2.5 Validity

I was the interviewer for this study and my perspective will have inevitably influenced the study design, development of the interview guide, development of the coding manual and data analysis. Regular discussions with Lucy Yardley (LY) and some discussion with colleagues from the Institute of Naval Medicine took place to obtain critical feedback and to gain different perspectives on the aforementioned stages. Colleagues from the Institute of Naval Medicine commented on earlier versions of the interview guide and demographic sheet to ensure that the questions made sense to RN personnel. To address issues around rigour, credibility, and relevance of qualitative studies, a tool developed by the Critical Appraisal Skills Programme was used to guide the development of this study (Public Health Resource Unit, 2006). To ensure credibility of the findings, themes derived from the 21 interview transcripts were discussed with LY.

4.2.6 Reflexivity

I informed participants that I was a research student whose aim was to gather information on participants' weight management experiences in the Royal Navy (RN) to modify an existing web-based weight loss intervention. My intention in presenting myself as a naïve researcher, unaffiliated with the RN, was to put

participants at ease, allowing them to talk freely about their positive and negative experiences with weight management in the RN. At the time I was conducting the interviews, I was a healthy weight female in my mid-twenties, interviewing predominantly obese male RN personnel under the age of forty. Some participants may not have been comfortable enough to share emotional experiences or sensitive information with a younger female interviewer. In general, all but one, female participants were more talkative and willing to share emotionally loaded stories compared to male participants.

All but one of the participants was approached by physical training instructors to take part in an interview. Some participants may have felt obliged to agree to participate in an interview but at the beginning of the interview participants were informed that they had a right to withdraw. Physical training instructors were not asked about whether any participants who were approached refused to take part in an interview. In hindsight, this information would have been valuable.

At two of the bases, interviews were arranged by physical training instructors, who scheduled some participants to be interviewed on the same day. During two of the interviews, the next participant arrived at the interview location whilst the interview was continuing, which resulted in the interviewer concluding the interview sooner than the natural ending point.

4.3 Results

This section presents 21 overweight and obese Royal Navy (RN) personnel's weight management perceptions and experiences in the RN. Participants' demographic details and self-reported anthropometric measurements are reported in Table 8.

Table 8 Participant characteristics

Characteristics	Men (<i>n</i> = 16*)	Women (<i>n</i> = 5**)
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Age		
22-30	7	2
31-40	5	0
41-45	0	2
Self-reported BMI		
26-29	3	1
30-33	9	1
34-35	0	2
Years served in Royal Navy		
4-9	8	2
10-19	2	0
20-23	3	2
Years serving on ships		
0	3	0
1-10	7	3
11-15	2	1
Years living in naval accommodation		
<1	1	0
1-8	10	2
9-12	2	2
Marital status		
Single	7	3
Married	6	0
Divorced	0	1
Serving at Royal Navy base		
HMS NELSON	3	3
HMS SULTAN	4	0
HMS COLLINGWOOD	9	2
Weight management status		
Successful	9	1
Unsuccessful	7	4

Notes: *Missing demographic information from three male participants as they chose not to provide any demographic information; one male participant partially completed the demographic sheet and had missing anthropometric data, age and time spent on ships. **One female participant chose not to complete the demographic form.

Participants' weight management status, i.e. whether they were successfully or unsuccessfully losing weight, was based on participants' perceptions of their recent weight management efforts. Ten participants described themselves as losing excess weight by making changes to their dietary and/or exercise behaviours for at least three months. Eleven participants reported struggling to lose weight because of various personal and environmental barriers for at least the last month.

The analysis of participants' accounts suggests that the following factors may be related to participants' weight management behaviours: the naval environment and culture, influences of others, motivations to manage weight,

perceptions of self with regard to excess weight, perceptions of weight management, explanations for successful weight loss and explanations for unsuccessful weight management. Table 9 presents these themes with the associated sub-themes derived from participants' accounts.

The factors that may be related to participants' weight management experiences have been described individually in the sub-sections below; however, these factors appeared to be interrelated, demonstrating the complex processes involved in participants' reports of their weight management attempts.

Table 9 Factors that may be related to participants' weight management experiences

Major themes	Sub themes
The naval environment and culture	Opportunities for exercise & weight management support Eating culture
Influences of others	Keeness of others to help with weight management Comparing self to others Feeling unsupported Support is there if needed Supportive home environment Weight loss noticed by others makes one feel good
Motivations to manage weight Perceptions of self with regard to excess weight and weight management	Awareness of excess weight Excess weight as a problem Excess weight as a source of embarrassment
Perceptions of weight management	Desire for weight management to be habitual Perceptions of exercising Lifestyle change needed Healthy lifestyle perceived as 'boring'
Explanations for successful weight loss	Self-discipline Self-monitoring Planning for exercising Getting into a routine
Explanations for unsuccessful	Personal barriers

4.3.1 The naval environment and culture

Most participants mentioned barriers to weight management in the naval environment and culture. Participants commented on the limited food options provided by the RN, the restrictions on opportunities to make use of exercising facilities and weight management support (e.g., physical training instructors and medical staff), and the incompatibility of the eating/drinking culture and social life in the RN with weight management behaviours.

Participants who had their meals in the RN's dining facilities stated that food options depended on what the RN provided, which was generally limited in terms of variety. Although healthy options were provided, these were usually not appealing and participants tended to prefer hot foods.

“The healthy option, it was there, but it wasn't that appealing, and do you know what I mean, there was enough of it there but people don't go for it. You know you go for the hot food, even at lunchtime, go for hot food. There is always a hot meal on. Umm... you know the hot choices are never overly healthy and it is kind of like much like pile your plate up high really.” (Participant 4, male, age 23, BMI 29, successfully losing weight)

The current layout of food in RN dining facilities requires RN personnel to walk by hot food options before getting to the salad and baguette counters. One participant suggested changing the layout of the hot food counter and the salad counter as a way to facilitate RN personnel to make healthier food choices:

“It would be easy if like I said if they put the salads before all the hot tasty stuff. You know, then that would be easier to go in there and then you can have your salad before you see all the other options, you are more likely then, to stick with the salad. Which

would obviously help you lose weight.” (Participant 7, male, aged 27, BMI 33, successfully losing weight)

Participants who mainly lived in self-catered RN accommodations explained that facilities for preparing meals were limited, which led some to opt for taking their meals in the RN’s dining facilities. Hot food options provided by the RN were perceived as unhealthy and many participants believed that self-catering was healthier than eating in the RN’s dining facilities.

“But I find [self-catering] is a lot healthier than going to the dining hall.” (Participant 12, female, aged 45, BMI 26, successfully losing weight)

Participants explained that the lack of variety and lack of healthy options in RN provided meals were due to the dining services’ limited budget.

“[The catering services] are pretty much restricted by the amount of money that they get given on a daily basis for what they can cook.” (Participant 2, male, aged 40, BMI 33, successfully losing weight)

Some participants reported not having enough time in the day to exercise due to work commitments. A distinction was made by some participants regarding the Navy’s time and their personal time, viewing exercising as an activity to be completed during working hours in the Navy.

“I think that is one of the biggest problems is that time is not put aside for you. They want us to maintain levels of fitness and obviously the weight all comes under that, but they don’t... don’t allocate the time for you to do it” (Participant 7, male, aged 27, BMI 33, successfully losing weight)

About a third of participants had established an exercise routine within their working day (e.g. taking longer lunch breaks in order to exercise and have lunch). Conversely, among participants who had been unsuccessful at establishing an exercise routine, they explained that one of the reasons they were unable to find time to exercise was because they perceived that exercising during work hours would be considered inappropriate by other RN personnel. One participant did not feel he had the option to exercise during working hours because he believed his divisional officer would be dissatisfied with the fact that the participant was spending his work time exercising rather than working.

Limited exercising opportunities were also reported on ships due to limited equipment. Although there is a booking system to ensure all RN personnel get access to the equipment, this system is apparently not enforced consistently.

“You are only meant to book the equipment for thirty minute sessions as well, so that it can rotate round. But a lot of the time that doesn’t happen.

Int: What tends to happen?

Well people will go in there and they will book it out for two or three slots so they could be on there for an hour, an hour and a half on the same bit of equipment,” (Participant 7, male, aged 27, BMI 33, successfully losing weight)

Participants reported that they believed weight gain onboard was common because of the abundance of food on ships, ease of access to beer, restricted opportunities to exercise, and the limited support for weight management on ships. Participants perceived that at best one could maintain their weight by exercising regularly. One participant talked about drinking more beer at sea than while on shore.

“You know and the alcohol is really cheap. So there is the temptation that I would have a beer rather than a diet coke, you know. Whereas if you are at home, your fridge might not always

contain beer. When you are on a ship the fridge always contains beer.” (Participant 2, male, aged 40, BMI 33, successfully losing weight)

Conversely, one participant believed that she gained weight when on shore as opposed to being on a ship. This overweight female participant was a chef on a ship before she was medically downgraded and sent to a shore establishment because of knee problems.

“I am always on my feet and I’m always on the go when I am doing my normal job, which is what I prefer because also you know my weight is not a problem when I am on board, I tend to lose weight when I am away at sea as well. Because I am constantly on the go. Whereas I find sitting down all day, or doing the job I am doing or... even just not being on a ship... because you are not constantly on the go, I tend to put more... I tend to put weight back on, when I am not at sea. I am one of these people I am better off on my feet doing stuff, twenty four seven, and I lose weight, so it’s... better for me. I just find it harder being just... don’t like being shore side.” (Participant 19, female, aged 42, BMI 33, successfully losing weight)

The RN environment emphasises the importance of personal fitness, with mottos such as “fit to fight – fit for life” posted in Sports and Recreation Centres, accommodation halls, and dining halls. At the majority of RN bases and ships, physical training instructors are available to support RN personnel with their fitness regimes, should RN personnel seek it. For overweight and obese RN personnel it is compulsory to work with a physical training instructor to lose weight. However, participants explained that most socialising with other RN personnel took place either during mealtimes or at the bar after working hours. Five participants stated that it was difficult to manage weight in the RN because of the eating and drinking culture in the Navy which encouraged the consumption of large quantities of food and alcohol.

“For instance like if we are in a bus going to, coming back from a gig, everyone just wants to like grab a few beers, and have them on the way back, because that is basically a whole day when you have not done any physical activity, but you have taken on all these calories, that it ends up being quite an unhealthy day,” (Participant 9, male, aged 26, *BMI not reported*, unsuccessfully attempting to manage weight)

The incompatibility between the eating and drinking culture with weight management behaviours, as well as the emphasis on fitness rather than weight management, may leave some RN personnel unwilling to engage in weight management behaviours as it may interfere with being socially accepted.

“it’s no fun sitting around sober while people are getting drunk round you to be perfectly honest,” (Participant 21, male, aged 35, BMI 33, successfully losing weight)

In summary, the naval environment was perceived as providing limited food options and restricted participants’ opportunities to exercise. An additional barrier to weight management was the incompatibility of the eating and drinking culture in the RN with weight management behaviours.

4.3.2 Influence of others

Participants reported family members, friends, physical training instructors, medical staff, and divisional officers having positive and negative influences on their weight management efforts. The influence others had on participants’ weight management efforts could be direct or indirect. A direct influence could be described as an encounter with another person which influenced the participant’s weight management efforts.

Participants' positive experiences with others included the keenness of others to help with weight management, receiving acknowledgement for their weight loss, and family members creating a home environment that was supportive of weight management. The majority of participants stated they had been referred to medical staff and physical training instructors for weight management because they had failed the RN fitness test. Only two female participants stated that they had approached medical staff and physical training instructors for weight management support of their own accord. Participants receiving support from divisional officers, physical training instructors and medical staff for weight management reported positive and negative experiences. Participants appreciated the keenness with which physical training instructors and medical staff encouraged participants to take advantage of sports facilities in the RN, and the time they took to monitor participants' progress, to answer participants' questions, to give personalised information, and to share their own experiences with weight management with participants.

“they were keen to try and pass on their knowledge and umm... when you go over and they say to you things like, God you have lost loads of weight, I haven't seen you for like a couple of months. You know, how's the training going, or you know, are you feeling better in yourself. So they try and draw the information out of you, and they are genuinely interested,” (Participant 2, male, aged 40, BMI 33, successfully losing weight)

One participant reported exercising with their divisional officer in order to lose weight:

“My Divisional Officer will usually find a gap during the day to take me running somewhere” (Participant 10, male, aged 34, BMI 33, unsuccessfully attempting to lose weight)

There were gender differences in participants' reported experiences of receiving acknowledgement of weight loss from others. Male RN

personnel reported physical training instructors and medical staff seldom acknowledged their weight loss, while female RN personnel shared examples of their weight loss being acknowledged by other RN personnel, friends and family, as well as physical training instructors and medical staff.

“Some other people have come up to me and said oh your uniform is looking a bit big and you look like you have lost weight”

(Participant 3, female, aged 24, BMI 34, unsuccessfully attempting to lose weight)

“Guys won’t tell you that you are looking great, but like I say there is nobody to pat yourself on your back” (Participant 14, male, aged 39, BMI 29, successfully losing weight)

Some male participants who were living with a partner commented on how their partners restructured the home environment to help them with their weight management attempts. For example, partners hid high calorie foods that were intended for other members of the family, they did not buy high calorie foods, they swapped alcoholic beverages with low calorie drinks, and they stopped cooking excessive amounts of food.

“My wife goes around hiding all of the nice food around the house, so that I don’t... and she knows where I look so she’s got some really good hiding places.” (Participant 2, male, aged 40, BMI 33, successfully losing weight)

Some participants reported having negative experiences with physical training instructors and medical staff. Participants felt unsupported when their personal needs and circumstances were not taken into consideration in the advice and treatments they received from medical staff or physical training instructors for weight management. These participants were unable to incorporate recommendations into their day-to-day lives.

“They have offered all kinds of stuff. They have offered... I can’t remember the name of the tablets, but basically stop you

absorbing fat, but the side effects of that are quite horrific as you can imagine. And it's not something I could really take in this job, being as there is a lot of parade work and you don't have toilets to hand," (Participant 5, male, aged 34, BMI 30, successfully losing weight)

Participants disliked receiving generic advice, or feedback they perceived as being insincere from medical staff and physical training instructors regarding one's weight management efforts. One participant reported feeling disappointed when they were referred to join an external weight loss programme (e.g. Weight Watchers, Slimming World), when they had sought weight management support in the RN. These participants were dissatisfied with their search for weight management support in the RN.

"You go across to see the doctors, or the nurses, all they will do is they weigh you on a regular basis and suggest that you go and join an outside club like Slimfast, umm... Slimming World or Weight Watchers." (Participant 10, male, aged 34, BMI 33, unsuccessfully attempting to lose weight)

Two participants blamed physical training instructors and medical staff for not providing them with meal plans that they could follow, and one participant complained about not being given a tailored exercise package which they were promised by a physical training instructor. These participants felt their weight management efforts were being held back by others and used this as a justification for their lack of success with weight management.

"the physical training instructors, considering you know I have been asking them every week, can you put a package together for me, and they are all like, yes, you know I'll have to for you on Monday, and then Monday comes, and it is like, I'll have it for you on Friday. So I started working here in November? End of October, start of November, and I am still waiting for this package that

supposedly going to be written for us to help me” (Participant 7, male, aged 27, BMI 33, successfully losing weight)

Some participants reported comparing themselves to others in the RN with regard to weight, rate of weight loss and exercise intensity. In some cases, participants who compared themselves with others in terms of weight status felt frustrated about having to engage in weight management when there were people with higher body mass indexes than themselves. This sub-theme is an example of other people may have an indirect influence on participants’ weight management experiences:

“Looking round I sometimes think I don’t know why I am worrying because there is a lot bigger people than me in the Navy. So you look at some people and you think, blimey.” (Participant 12, female, aged 45, BMI 26, successfully losing weight)

“You do see like a lot of unfit people, and you think how are they passing their fitness test, and that’s you know, it just doesn’t make sense to me really. ” (Participant 17, male, *age and BMI not reported*, successfully losing weight)

On the other hand, comparing oneself to another person while at the gym was reported as a motive to exercise more intensely. One participant explained that they challenged themselves more during an exercise, if they compared themselves to others.

“I think what it is, if you have got somebody there you think oh I can’t wimp out, I have got to keep going. Or I have got to do better than they are doing. That’s my mentality.” (Participant 12, female, aged 45, BMI 26, successfully losing weight)

A few participants gave examples of how family and friends could make engaging in weight management difficult.

“When you are visiting friends and family, and they are offering you drinks and copious amounts of food. So that... that... I did have a bit of a hiccup at Christmas” (Participant 2, male, aged 40, BMI 33, successfully losing weight)

All participants were aware of the support available for weight management in the RN. The few participants who had not had any experience with physical training instructors or medical staff for weight management perceived them as approachable and that they would be helpful with weight management if participants decided to seek help from them. One of these participants was successfully losing weight and did not feel the need for additional support from medical staff and physical training instructors. Other participants stated that weight loss was not a priority for them and therefore they had not sought additional support.

In summary, the majority of participants had experiences with people who were keen to help with weight management. Among participants who were unsuccessfully losing weight, some had experiences with people who were perceived as being unsupportive due to insufficient advice in terms of participants' diet. The web-based weight management intervention may meet participants' need for dietary advice and could be offered to overweight and obese RN personnel alongside support from physical training instructors. Participants who were not seeking support from others for weight management were aware of the support systems in place in the RN and the availability of support, should they seek it.

4.3.3 Motivations to manage weight

Participants had various motivations as to why they wanted to manage their weight. Participants' motivations could be seen as falling on a continuum ranging from internal to external motivations. Interestingly, whether a participant reported more intrinsic or extrinsic motivations for weight management did not appear to be related to success with their attempts to manage their weight in this sample. The majority of

participants' weight management motivations were external, which included wanting to manage weight to maintain or progress one's career in the RN, perceiving weight management as being compulsory, to avoid the embarrassment of not having lost weight by their next appointment with medical staff or physical training instructors, and exercising as a way to break up the work routine.

"It gets you out of the work for an hour, it gives you something to do, and then it's a change of scenery." (Participant 3, female, aged 24, BMI 34, unsuccessfully attempting to manage weight)

Some motivations could be seen as partly being internally as well as externally driven. For example, one participant perceived he would be letting down his family by remaining obese, suggesting that his core beliefs about his identity may have been influenced by his partner and children.

"I have got two small kids, they are nine and six. You know I don't want other kids taking the micky out of them saying your dad's a big fat fu... you know whatever you like. So that's one thing, plus my Mrs as well, you know I'll like to look good for her as well," (Participant 8, male, aged 30, BMI 33, unsuccessfully attempting to manage weight)

Internal motivations for weight management included wanting to get fitter, look and feel better, improve confidence, improve health, prevent obesity-related health problems, and to reduce excessive sweating that was attributed to excess weight.

"Just to generally feel better about myself, really, because I am not as happy with my body as I should be I don't think. Just to generally feel better about myself and... get my confidence back I suppose a bit more." (Participant 3, female, aged 24, BMI 34, unsuccessfully attempting to lose weight)

Gender differences were evident in participants' intrinsic motivations for wanting to lose weight. Male participants were more likely to talk about wanting to become fitter as opposed to losing weight, while female participants wanted to lose weight to improve confidence and feel better.

4.3.4 Perceptions of self with regard to excess weight

Some participants explained how they become aware of their excess weight, viewed excess weight as a problem, or as a source of embarrassment. Some participants noticed weight gain from their clothes feeling tighter or from comparing their current selves to photographs of their past slimmer selves.

“If you look at yourself in the mirror and then you look at a photo of what you had a couple of years ago, and you look at yourself in the mirror after, it's like... in that picture you don't hardly recognise the person, where you want to go back to what you used to look like” (Participant 22, female, *age and BMI not reported*, unsuccessfully attempting to manage weight)

About half of the participants spontaneously discussed how long they had struggled with excess weight. Seven participants, including all female participants, stated that excess weight had been a longstanding issue, while four participants explained that excess weight had not previously been an issue prior to joining the RN and this was the first time they had tried to lose weight. Nine participants, all of whom were male, did not discuss how long they had tried to lose weight during the interview. The majority of participants who talked about how long excess weight had been a problem were unsuccessfully attempting to manage their weight, while successful weight loss was more commonly achieved among participants who did not discuss how long they had tried to lose weight. It may be that participants who were successfully achieving weight loss did not perceive excess weight as a chronic or acute problem since they were successfully dealing with it.

All female participants reported feeling embarrassed to exercise when fitter RN personnel were exercising in the gym. Some female participants had personal stories of overcoming their initial embarrassment about going to the gym or exercising with others because of their excess weight. None of the male participants shared any stories of this nature.

One female participant exercised at home because she did not feel comfortable exercising in the gym.

“You go to the gym anytime and see if you go to the gym in your own time but you go and nine times out of ten it is full of like... booties and fitties and... dives, and you walk in and you walk out again because you don't feel comfortable. I've done it, I know I have, because I just didn't feel comfortable. I was like no, I don't like that, I can't be bothered, and I'll go home again, and that's what, one of the problems was I think.” (Participant 19, female, aged 42, BMI 33, successfully losing weight)

Other female participants reported going to the gym despite feeling embarrassed, which they report, made them realise that either others did not make them feel uncomfortable or that they did not care about the views of others while they exercised at the gym.

In summary, it was mainly female participants who reported self-perceptions with regard to their overweight or obese weight status. Some male participants briefly mentioned the duration of their experience with excess weight but unlike female participants, none of the male participants reported feeling, nor did I perceive them as appearing embarrassed about their excess weight.

4.3.5 Perceptions of weight management

Participants reported their perceptions of the weight loss process and the means by which they strived to manage their weight, including exercising, eating patterns and their lifestyle.

Some participants viewed weight loss as a slow process, which they attributed to their older age. Participants expressed a desire for weight management to be habitual and for weight management behaviours to be automatic.

“I think once I have got into, made it a bit more of a habit, you know if I can get out running every day, even if it is only for half an hour, eventually it will just become part of my routine, is the plan. You know like getting addicted to smoking, eventually if I just keep doing it enough, even if I don't like it, umm... eventually I will start to see that as part of my daily routine whether I want to do it or not.” (Participant 9, male, aged 26, *BMI not reported*, unsuccessfully attempting to manage weight)

Taking up or increasing exercise was a common method by which participants attempted to lose weight.

“I think it is more of a question of not being fit rather than necessarily being overweight”
(Participant 9, male, aged 26, *did not report BMI*, unsuccessfully attempting to manage weight)

Most participants described intensive and challenging workouts as good, while there was some hesitation about labelling moderate intensity exercises such as stability training as a workout.

Some participants felt good about having exercised and reported eating more healthy food and implied being in a better mood because they had exercised. These participants ate more healthily because they did not want their hard work to go to waste.

“[Exercising] has a knock on effect at home as well, because you are not going home tired etc., still quite motivated, which it shows in your eating really. You don’t comfort eat or anything, and think oh, I’ll just get a takeaway in or something like that” (Participant 5, male, aged 34, BMI 30, successfully losing weight)

Some participants who had always struggled with weight stated that a lifestyle change was needed to successfully manage weight, as their previous attempts to lose weight by dieting had proven that diets were not a sustainable means for managing weight.

“It’s just my lifestyle I have got to change. But... I don’t think there is anything more they could do. They have told me to do the phys so I have got to do it and I have just got to sort the other side out of eating properly.” (Participant 13, male, aged 26, BMI 33, unsuccessfully losing weight)

Participants who perceived their lifestyle as being healthy also described it as being ‘boring’. Some participants stated they did not believe that one should eliminate all unhealthy tempting food and drink from their diet; rather cravings should be satisfied without going overboard.

“You know when I have got to a stage where I am just constantly thinking about it, I have got a pizza but, you know me and me girlfriend we used to have a pizza each, and we would have side orders on top of that. But now if I feel like a pizza and that’s all I am thinking about is, we will get one pizza, and we will share it between us, we won’t get all the side orders, just to take that craving away” (Participant 7, male, aged 27, BMI 33, successfully losing weight)

In summary, participants desired weight management behaviours to become habitual, implying that engaging in weight management behaviours may be effortful. According to some participants, the more

intense the workout, the better the benefits were to be gained in terms of weight management. Some participants who reported having a healthy lifestyle perceived it as being 'boring' but some stated that cravings could be occasionally satisfied without compromising one's weight management efforts.

4.3.6 Explanations for successful weight loss

Participants who were successfully or unsuccessfully, attempting to manage their weight, spontaneously commented on their experiences and beliefs about how to maintain a healthy weight. Participants cited self-discipline, self-monitoring, planning in advance for exercise and getting into a routine as being crucial for achieving weight loss and maintaining a healthy weight. Participants who were successfully losing weight frequently gave examples of how they had 'worked it out for themselves'.

"It is all about time, personal time management. Yes, it is up to the individual, I don't know... I know how to do it for myself but... I can't say the same for everybody else... So I find going to the gym at lunchtime is ideal. Umm... and then it gives me the rest of the day to sort... to do other bits and pieces I need to do, and leave the evening free to spend with my fiancé. So I think it works out quite well." (Participant 4, male, aged 23, BMI 29, successfully losing weight)

Conversely, one participant who was unsuccessfully managing their weight stated that they needed guidance on their dietary behaviours because they had not had success with trying to work out weight management on their own:

"Maybe get a diet plan off somebody, so I would know what to get, instead of trying to work it out on my own sort of thing,"
(Participant 13, male, aged 26, BMI 33, unsuccessfully attempting to manage weight)

Some participants who were successfully losing weight admitted experiencing tension between engaging in weight management behaviours and what they ideally would have liked to eat and activities they would rather be doing instead of exercising. These participants talked about the importance of being self-disciplined and strict with oneself to lose weight.

“I would like to be able to go home on a night time and not have to attend the gym, **mmm**. Obviously I would like to be able to go to the gym when I want to and not because I have got to [...] what I would like to be able to eat [*laughs*] and what I would choose is two different things...” (Participant 7, male, aged 27, BMI 33, successfully losing weight)

Self-monitoring one's weight and fitness were common among participants who were successfully losing weight. Three participants also reported monitoring their dietary intake by writing down everything they ate and appeared to have lower body mass indexes compared to other participants.

Some participants talked about getting into a habitual 'training mind set', which they described as necessary for initiating exercise, especially during times when one did not feel like exercising.

“The first day, well on a Monday I am like I don't want to go, but then I go and then that's it I am alright for the week. I am quite happy to go, so it's with me it's more habit... once I get into the habit of doing it.... Then I am alright, it's just getting back into that habit if going,” (Participant 19, Female, aged 42, BMI 33, successfully losing weight)

Participants believed it was easier to plan for exercise when they had a work routine. Successful participants made time for exercising by allocating times to exercise around their work commitments and meal

times. Successful participants talked about getting into an exercise routine of their own accord which was in addition to the remedial training package. They achieved this by trying different exercises to identify ability-appropriate, interesting and enjoyable exercises which they could pursue as a hobby.

“But I love [trying new types of exercises], I got involved in them. I am not afraid to give things a try.” (Participant 14, male, aged 39, BMI 29, successfully losing weight)

In contrast, unsuccessful participants only allocated time for the remedial training package and the once-a-week Healthy Lifestyle sessions. Some unsuccessful participants felt that increasing the frequency of the Health Lifestyle sessions would help them get into an exercise routine. Unsuccessful participants believed that having compulsory exercise sessions organised by the Navy that were incorporated into the working day would help overweight and obese RN personnel manage their weight. Participants gave the example of adherence to the remedial training package as evidence that being forced to exercise works for overweight and obese RN personnel who have been unable to establish their own exercise routine.

“Cos I only seem to do phys when I am made to do phys. I don't really go out and do it on my own. So now I am being made to do phys, I am seeing some differences.” (Participant 13, male, aged 26, BMI 33, unsuccessfully attempting to manage weight)

In summary, participants who were successfully losing weight mainly attributed their success to establishing an exercise routine which fitted in with their day-to-day tasks. These participants also highlighted the importance of self-discipline when it came to avoiding the temptation of unhealthy foods and motivating oneself to exercise even when one did not feel like it. Participants who were unsuccessful at achieving weight loss implied they were not self-disciplined and stated that they required

external discipline to ensure they engaged in weight management behaviours.

4.3.7 Explanations for unsuccessful weight management

Participants stated various personal and external reasons as to why they had been unsuccessful with weight management. Personal reasons for unsuccessfully managing weight included weight management not being a priority, not noticing weight gain, lacking the knowledge, being physically unable to exercise and not considering oneself as needing to lose weight.

Participants who had been unsuccessfully attempting to manage their weight said they wanted time to relax after work and did not want to worry about engaging in weight management behaviours, which they reported was more important to them than losing weight. These participants did not want to exercise during their own time, eat smaller portions or give up high calorie foods. One participant described a time when weight management was not a priority:

“At lunchtime I didn’t feel like I had the time. Umm... and in the evenings again you are just so knackered from the day you just think I can’t be bothered. I just want to sit and have a couple of drinks and just chill out, because they work you that hard, that you, you just want to relax, you don’t want to sit there and have to go to the gym, you know. You don’t want to sit there and worry about what you eat, you just want to try and be comfortable...”
(Participant 4, male, aged 23, BMI 29, successfully losing weight)

Some participants who did intend to lose weight stated that they did not have sufficient knowledge to lose weight.

“You don’t get this size without doing something wrong, but I don’t know what it is if I am doing something wrong, eating wise.”

(Participant 11, male, aged 23, BMI 32, unsuccessfully attempting to manage weight)

Three participants reported engaging in unusual behaviours to lose weight, such as not eating anything during the day and only having their dinner. Another participant reported going through a phase where they were just eating fruit.

One participant had a false belief about what happened to the food they consumed after having exercised.

“I normally try and [exercise] before dinner, because then the golden hour after training you are supposed to be able to eat what you want and turn it all into muscle rather than fat.” (Participant 2, male, aged 40, BMI 33, successfully losing weight)

Several participants explained they were limited in the exercises they could engage in because their excess weight restricted them.

“I have had problems with me... with me legs, and shin splints and pains in me calf muscles, which is why the MO got involved, because he says that it was down to me weight that was, bringing these problems on. So I haven't been able to run because me legs are in too much pain. So I basically just been on the cross trainer so that there is no impact involved.” (Participant 7, male, aged 27, BMI 33, successfully losing weight)

Among external barriers to weight management, the cost of eating healthy food and the ease of access to unhealthy foods were commonly cited.

“You can end up spending a fortune in [*name of a supermarket*] if you're trying to buy all the healthy foods” (Participant 8, male, aged 30, BMI 33, unsuccessfully attempting to manage weight)

Some participants reported that having too much responsibility at home and at work meant that they did not have time to plan for weight management behaviours. Some participants who lived at home wanted to spend time with family and explained how this made it difficult to engage in weight management behaviours.

“When I met my fiancé and then I moved in with her and since then basically it was I would rather be at home than on board training, do you know what I mean, so I let it slip. And then I didn’t do anything, didn’t do any exercise or anything like that. I put a lot of weight on.” (Participant 4, male, aged 23, BMI 29, successfully losing weight)

Disruptions to participants’ work routines during holidays or special events (such as a family wedding) were cited as reasons for unsuccessful weight management.

“Just before Christmas... umm... I was over in the medical centre umm... with a nurse over there going through the dietary plans and that. And I have lost about, just under two stone I had lost, just before Christmas. Then Christmas happened, put on about five! [*Laughing*] No put on about another stone after, no during Christmas.” (Participant 11, male, aged 23, BMI 32, unsuccessfully attempting to manage weight)

In summary, participants cited personal barriers to weight management including weight management not being a priority, not noticing weight gain, being older, lacking the knowledge, being physically unable to exercise and not considering oneself as needing to lose weight. Participants’ external reasons for being unsuccessful at achieving weight management included the cost of eating healthy foods and the ease of access to unhealthy foods, time constraints, and disruptions to one’s routine.

4.4 Discussion

4.4.1 Implications of the findings in relation to the literature

The main aim of this study was to understand participants' dietary and physical activity habits and weight management experiences in the RN. RN dining facilities were described as providing limited options for healthy food. Participants reported that RN dining facilities primarily offered a limited variety of hot meals which were high in carbohydrates and fat, such as chips. Healthier food options mainly consisted of salads and baguettes, which most participants reported finding unappealing. Most participants who ate in the RN's dining facilities opted for hot foods. In contrast, participants who were successfully losing weight commonly reported eating lunches that were prepared at home and cooking evening meals at home. The majority of participants had experience of living in self-catered RN accommodations and reported that cooking facilities were limited. As a result, some participants frequently reported ordering takeaways or eating out in the RN's dining facilities or in fast food restaurants. Participants who were successfully losing weight and who lived in RN accommodations made use of the limited facilities to make their own meals. The RN eating and drinking culture was also viewed as being incompatible with weight management behaviours. Although the RN reminds personnel about the importance of personal fitness, with mottos such as "fit to fight – fit for life" posted around RN establishments, participants frequently described that it was common to consume large quantities of food and beer, especially when participants socialised with other RN personnel.

There were differences in participants' experiences of making use of the exercise facilities in the RN. Participants who reported regularly exercising said they exercised at various times of the day. Some reported exercising during their lunch breaks, while others mentioned exercising after work or in the morning before they reported to work. Participants who reported struggling to make time for engaging in regular exercise explained that the ideal time for them to exercise was during working hours. However, they perceived their work responsibilities as a barrier to making time to exercise. It appears that, according to these participants, it is the Navy's responsibility to set time during work hours for RN personnel to exercise. One participant believed that exercising during working hours would be deemed inappropriate by his

superiors and made attempts to exercise in his own time rather than the Navy's time.

Bandura's Social Cognition Theory (1986) offers one of the few theories that highlight the importance of the environment on influencing people's self-efficacy (i.e. people's confidence in engaging in a behaviour), and their behaviours. Applying this theory to overweight and obese RN personnel's weight management experiences, the RN environment may have a central role in influencing people's self-efficacy to manage their weight and weight management behaviours. Despite the weight management support systems (i.e. gym facilities, physical training instructors) in place in the RN, many participants focused on the barriers to weight management in the RN. Even though participants cited barriers to weight management in the RN, they also frequently stated that to successfully manage weight one had to 'work it out for themselves'. This suggests that according to most participants in this study, the main responsibility for managing weight lies with the overweight or obese individual. These findings suggest that without any changes to the RN environment, interventions that target the individual alone may be less successful. In fact, there is some evidence to suggest that changes at worksites and at the environmental level may influence people to adopt healthy eating behaviours (Engbers, van Poppel, Chin A Paw, & van Mechelen, 2005).

The second aim of this study was to describe the weight management experiences of a predominantly male sample, as the majority of studies on overweight and obese people's experiences with weight management focus mainly on the experiences of females (Elfhag & Rössner, 2005; Garip & Yardley, 2011). The majority of male participants who were attempting to lose weight reported trying to achieve weight loss by taking up or increasing exercise, without making dietary changes. These participants also talked about 'fitness' as opposed to weight loss or weight management. It appears that the majority of male participants focused on becoming fit rather than trying to lose weight, which is consistent with the literature that shows men tend to view weight loss as a feminine subject (De Souza & Ciclitira, 2005). There may be a preference among heterosexual males to talk about fitness rather than weight loss or weight management (De Souza & Ciclitira, 2005). This may explain why almost half of the participants were trying to achieve fitness through exercising, with little or no change to their dietary behaviours. Given the evidence that

increasing physical activity together with diet is more effective than trying to manage weight through physical activity alone (K. A. Shaw, Gennat, O'Rourke, & Del Mar, 2006), some overweight and obese RN personnel may benefit from interventions that provide gender-specific information and ways to adopt dietary behaviours that are compatible with achieving weight loss. Furthermore, these participants may find it useful to learn about how weight loss can facilitate one's attempts to become fitter.

The majority of participants' weight management motivations were external, which have been found to be poorer predictors of successful weight management compared to internal motivations (P. J. Teixeira et al., 2006). Most participants reported extrinsic motives for managing their weight, with advancing one's naval career being the most frequently cited reason. Even participants who reported successfully losing weight tended to cite more extrinsic, rather than intrinsic motivations. For some participants, being in the Navy may have been associated with beliefs about their identity, which may have provided sufficient motivation to manage their weight. Overweight and obese RN personnel for whom progressing their naval career is not an effective source of motivation may benefit from using motivational interviewing tools, which have been found to enhance weight loss in overweight and obese people who want to lose weight by increasing intrinsic motivations (Armstrong et al., 2011).

There were differences in the nature of male and female participants' intrinsic motivations for wanting to lose weight, which is consistent with the literature on gender differences in motivations to manage weight (De Souza & Ciclitira, 2005; Grogan & Richards, 2002). All female participants explained feeling embarrassed about their weight status and reported wanting to lose weight to improve their confidence and feel better about themselves, which was not the case with male participants. Some male participants who reported motivations to lose weight stated concern for their health and not wanting to let others down. This suggests that interventions that provide gender-specific content may appeal more to users as they may find they are better able to relate to the intervention.

4.4.2 Limitations

Only one of the participants in the sample volunteered for an interview as a result of the recruitment poster. All other participants were informed about the study by their physical training instructor. The self-selected participant was successfully losing weight, was more talkative and reported more positive experiences with weight management compared to the majority of participants who volunteered for the study after being informed by physical training instructors. More positive experiences of weight management were reported than negative instances. At the beginning of each interview, participants were informed that the interviews were confidential and that all identifiable information would be removed in any publications made available to the RN. Nevertheless, some participants may have been hesitant to disclose their negative experiences with weight management in the RN. It is not clear whether any of the overweight and obese RN personnel who were approached by the physical training instructors declined to take part in an interview. It would have been useful to obtain this information for determining whether there were differences in the characteristics of RN personnel who volunteered for an interview and those who did not. It was not the aim of this study to generalise findings across all overweight and obese RN personnel, but we were interested in the weight management experiences of overweight and obese RN personnel from diverse backgrounds in order to appropriately modify the POWeR web-based weight management intervention for the RN.

This study does not aim to demonstrate causal relationships between actual weight loss and the RN personnel's perceived hindering and facilitating factors for weight management in the RN. Furthermore, participants' perceptions of factors influencing weight management may not be accurate and additional qualitative and quantitative research is warranted in this understudied population. Data were coded, analysed and themes were identified by myself and discussed regularly with my supervisor allowing me to completely immerse myself in the interview data. This process meant that the main perspective expressed in this chapter is mainly my own. Although data saturation appeared to have been reached, additional research is required to determine whether additional themes would emerge in specific groups (e.g. RN personnel with higher ranks) that were not well represented in this study.

4.4.3 Implications for the POWeR intervention

The interviews were useful for eliciting participants' dietary and physical activity habits and weight management experiences, which is valuable for informing the modifications to the content of the POWeR intervention to make it specifically relevant to the naval context. The POWeR intervention aims to empower users by encouraging them to use behaviour change techniques (Abraham & Michie, 2008), such as planning and self-monitoring, to develop their own weight loss and weight management plan, which some participants reported would be a useful resource to supplement their weight management efforts.

Participants' experiences of planning weight loss-related behaviours appeared to be related to their (lack of) success with weight loss. Most participants who reported successfully losing weight stated planning their meals and the times they would exercise to some degree. These participants were essentially setting themselves goals for specific weight management behaviours. Previous research has found that goal setting may enhance weight loss (Franz et al., 2007; Klein et al., 2004; Shilts, Horowitz, & Townsend, 2004). Participants who reported successfully losing weight also reported monitoring their behaviours and being strict with themselves, which was not the case with participants who reported being unsuccessful with weight management. Lack of goal setting may partly explain why some participants reported being unsuccessful with weight management. Unsuccessful participants may benefit from the POWeR intervention that prompts users to set detailed goals related to weight management. Examples of the behavioural goals set by RN participants who reported successfully losing weight were therefore incorporated into the intervention, such as, "I will exercise during my lunch break" and "I will bring fruit with me to work so that when I want a snack I will eat my fruit and won't go to the NAFFI or the vending machine".

The intervention also provides examples of how other people identify barriers to weight management and the solutions they adopt to overcome these barriers using behaviour change techniques (Abraham & Michie, 2008). The stories in the existing version of the POWeR intervention are relevant to

obese people in civilian settings and are unlikely to serve as useful examples for overweight and obese RN personnel who may use the website. The interview data provides a variety of examples for identifying and, occasionally, overcoming barriers within the naval context that are likely to appear credible to overweight and obese RN personnel who may use the RN version of the POWeR intervention. For example, some participants reported that they were likely to eat and drink more when they were socialising with other RN personnel. Some participants explained that they set limits on their alcohol intake, while others decided they would not drink any alcoholic beverages. Such examples were used to replace the existing stories in the intervention that are more relevant to users in civilian settings.

Participants generally perceived physical training instructors and medical staff as being keen to help with participants' weight management efforts; however, among participants who were unsuccessfully managing weight, there appeared to be a need for more support in terms of dietary advice. Most participants, regardless of their experience with weight loss, had received exercise plans that were regularly monitored by physical training instructors. Some participants who were unsuccessfully managing their weight stated that they would welcome an eating plan and believed it would be helpful in their efforts to lose weight. These findings suggest that the POWeR intervention may be timely and relevant for filling the gap regarding dietary advice for some overweight and obese RN personnel. On the other hand, a session of the intervention which aims to increase physical activity through developing a walking plan appeared to be less relevant to RN personnel and was excluded from the version of POWeR for the RN.

The majority of male participants who were attempting to lose weight tried to achieve weight loss by taking up or increasing exercise, without making dietary changes. These participants also talked about 'fitness' as opposed to weight loss or weight management. It may be useful to raise some participants' awareness that weight loss will facilitate one's efforts to become fit. For participants who were trying to become fitter, the links between weight loss and fitness need to be made clear in order for participants to be convinced of the relevance of the POWeR intervention. The POWeR intervention provides users with information about the links between weight loss and fitness but

these links were emphasised to a greater extent in the version of POWeR for the RN.

Participants who reported being unsuccessful with weight management perceived that in order to successfully lose weight they needed to plan and self-regulate their food and drink intake. For various reasons, including weight loss not being a priority, these participants were not engaging in these behaviours. Participants for whom weight loss was not a priority may have lacked motivation to engage in behaviours that would lead to weight loss. The POWeR intervention encourages participants to think about their reasons to manage weight, and to think about the pros and cons of managing weight. This may help participants who are less motivated to manage weight to potentially become internally driven to attempt to adopt a lifestyle compatible with successful weight management. It is assumed that users of the POWeR intervention will be motivated to lose weight however, given that many overweight and obese RN personnel do not appear to be intrinsically motivated, the motivational tools were featured more prominently in the RN version of POWeR.

4.4.4 Implications for the Royal Navy

The naval environment provides substantial weight management support for overweight and obese RN personnel through physical training instructors, medical staff, healthy lifestyle clubs, facilities for exercising, etc. However, paradoxically participants viewed the eating and drinking culture in the RN as a barrier to weight management behaviours. Participants described the eating and drinking culture in the RN as encouraging the consumption of large quantities of food and drink. This suggests that there is a niche for an intervention that provides individuals with the knowledge and tools to manage their weight, and to make behavioural decisions that override environmental pressures that may fuel overweight and obesity (Hill, Wyatt, Reed, & Peters, 2003).

A practical recommendation by some participants that could be easily implemented in the RN was to swap the location of the salad counter and the hot food counter. This change may encourage some RN personnel to make

healthier dietary choices. This idea is in accordance with nudge theory. According to nudge theory, our environments can be arranged in ways which encourage people to make healthier behavioural decisions (Thaler & Sunstein, 2008). Implementing relatively minor environmental changes that overweight and obese RN personnel perceive as important in the context of their weight management experiences may facilitate their weight management efforts in the RN. Another recommendation was for healthy hot food options to be made available as there tended to be a preference among participants for hot meals over cold foods.

Findings from this study demonstrate that individual differences in participants' weight management experiences exist. Some participants who were living on naval bases reported making use of the limited facilities for cooking, while others explained that the limited cooking facilities encouraged them to eat out, which they viewed as a barrier for achieving weight loss. Encouraging RN personnel who cook in self-catered accommodations to demonstrate how they make use of the limited facilities may help RN personnel who eat out to make their own meals. There were differences in participants' perceptions of whether it was a personal responsibility or the RN's responsibility to make time for exercising. Some participants who reported being unsuccessful with weight management viewed work commitments as preventing them from taking exercise. These participants perceived that it was the responsibility of the RN to make time during working hours for RN personnel to exercise. They reported not wanting to have to worry about their weight during the times when they were not working. Overweight and obese RN personnel's perceptions of responsibility for one's weight management need to be further investigated and these views may need to be challenged in order for individuals from this group to take personal responsibility for their weight management.

Almost half of the participants reported having physical problems with their back and joints, leaving them unable to engage in intense training. Some participants reported that these physical limitations prevented them from engaging in intense physical activity and were a major factor for their lack of success with weight management. These participants may benefit from being made aware that low impact or low intensity exercises are also effective for weight management (Richardson et al., 2008). This may be particularly

important for injured RN personnel who are unable to engage in high impact physical activities.

All female RN personnel in this study reported times when they had been too embarrassed to exercise in public spaces. Participants in this study were able to overcome their embarrassment of going to the gym but it is important to identify overweight and obese female RN personnel who may refrain from engaging in physical activity in public spaces and provide them with appropriate support.

4.4.5 Conclusion

This is the first study investigating overweight and obese RN personnel's views of weight management in the RN. The majority of the themes derived in this study, namely, influences of others, perceptions of self with regard to excess weight and weight management, perceptions of weight management, and explanations for successful and unsuccessful weight management are consistent with research on overweight and obese people's experiences with weight management in the general population (Elfhag & Rössner, 2005; Garip & Yardley, 2011). In contrast to the findings from chapter 2 relating to intervention users' need for autonomy, some participants who were unsuccessfully attempting to manage their weight in this study reported that they may be more likely to engage in a weight management intervention if it was compulsory.

A further finding of this study that is consistent with the existing literature was related to male participants' descriptions of their weight management experiences, which mainly focused on fitness rather than weight loss (De Souza & Ciclitira, 2005). Some participants perceived that they did not receive adequate support for their diet from physical training instructors, which may partly explain why some participants were attempting to manage their weight through increasing exercise alone. Participants who solely rely on physical activity to achieve weight loss may greatly benefit from dietary advice and behaviour change techniques that may enable them to overcome perceived barriers to weight management.

A novel theme that was derived in this study relates to the ways in which overweight and obese RN personnel perceived how the naval environment influenced their dietary and physical activity behaviours and their weight management experiences. Participants reported that the RN provided limited options for food. Although healthy food options were provided, most participants found these unappealing and preferred opting for the hot foods, which they perceived as less healthy. Relatively minor modifications in the RN dining facilities, such as swapping the location of the hot foods counter and cold foods counter, and making healthier hot foods more available, may facilitate some overweight and obese RN personnel to make healthier dietary choices. Some participants who were living in self-catered accommodations were able to utilise the limited facilities for making their own meals while other participants reported eating out because they perceived the limited cooking facilities as a barrier to making their own meals. It appears that differences in participants' determination to manage their weight may influence their choices regarding whether they will make their own meals or eat out, which has implications for weight management interventions in the RN. More specifically, some overweight and obese RN personnel may benefit from interventions that aim to increase one's motivation to manage their weight.

Despite the fact that most participants had regular contact with physical training instructors and received substantial support for exercising, some participants reported struggling to incorporate regular exercise into their lifestyle. Even in an environment where support systems for weight management are easily accessible and available, some overweight and obese RN personnel may lack the motivation to make use of these resources and to engage in weight management behaviours. Participants who reported being unsuccessful at establishing an exercise routine perceived that it was the RN's responsibility to make time for personnel to exercise during work hours. It may be beneficial to challenge the attitudes of some overweight and obese RN personnel who may be holding back from taking personal responsibility for their weight management.

Overweight and obese RN personnel are a unique and an understudied population. Despite the substantial support for weight management in the RN, some overweight and obese RN personnel struggle with their weight. Future research investigating the effectiveness of a web-based weight loss

intervention, such as the modified POWeR intervention, may be a cost-effective and feasible resource that can be used by overweight and obese RN personnel in conjunction with existing support systems for weight loss. The POWeR intervention provides users with the tools to develop an eating plan and may encourage some overweight and obese RN personnel to become motivated to take advantage of the available resources for weight management and to engage in behaviours to achieve weight loss and maintain a healthier weight.

5. Overweight and obese Royal Navy personnel's views of using a web-based weight loss intervention: a qualitative study

5.1 Introduction

The Royal Navy (RN) provides resources and facilities for supporting its personnel's weight management (see chapter 1 for a description of existing weight management resources in the RN). Despite these resources, some RN personnel struggle with excess weight. Chapter 4 highlighted several factors that may be involved in the maintenance of excess weight for some RN personnel. In addition to a potential lack of motivation to lose weight, or a possible unwillingness to take personal responsibility for one's weight management, some personnel mentioned that the RN context made it difficult to manage their weight. There was also a group of participants who were eager to lose weight but felt they did not have sufficient knowledge or the behavioural tools to effectively lose and self-manage their weight. For this subgroup, a weight management website that offers behavioural tools to self-manage one's weight may be an acceptable resource that could be used in conjunction with existing weight loss resources in the RN. Findings from chapter 3 suggested that some personnel, especially obese personnel and female personnel may welcome a weight loss website that provides advice and behavioural tools to support their weight management efforts.

RN personnel's experiences of using web-based weight loss interventions are currently unexplored. As potential users of a web-based weight loss intervention that may be implemented in the RN, overweight and obese RN personnel are in the best position to provide their perceptions of using a web-based weight management intervention. An existing website, namely POWeR ("Positive Online Weight Reduction"), underwent two phases of modifications in order to increase the website's relevance to the RN context (chapter 6). The first phase of modifications

was informed by the findings reported in chapter 4. This study, presented in chapter 5, was undertaken to ensure that the modified intervention was relevant and acceptable to overweight and obese RN personnel attempting to lose weight. The second phase of modifications was guided by the outcomes from this chapter.

In order to explore users' experiences with the weight loss website, overweight and obese RN personnel were invited to take part in a two-phased study; (1) a think aloud interview and (2) a follow-up telephone interview. In the first phase, face-to-face think aloud interviews were conducted to gain insight into participants' immediate reactions to the individual pages of the website's first session. Participants were then instructed to use, in their own time, as many of the remaining sessions as they chose to. Participants' retrospective global impressions of the subsequent sessions were gathered in a follow-up telephone interview.

This chapter examines overweight and obese RN personnel's experiences of using a web-based weight loss intervention in order to gain an understanding of how and why users may or may not engage with the website. Exploring the extent to which a predominantly male sample engages with a weight loss website may reveal interesting insights about a group of users, i.e. men, who are underrepresented in the literature (Elfhag & Rössner, 2005; Garip & Yardley, 2011). Furthermore, the findings may lead to the identification of further modifications for improving the website for use among users in the RN.

5.1.1 Aims

The findings of this study may provide insight into a predominantly male perspective on using a modified online tool (the POWeR website) for supporting weight management efforts. This study aims to explore users' perceptions and experiences of engaging with the POWeR programme that has been modified for use by overweight and obese RN personnel. Understanding overweight and obese RN personnel's engagement (or non-engagement) with the modified weight loss website may lead to the identification of further modifications to improve the intervention and

may facilitate the development of alternative approaches to website implementation.

5.2 Methods

5.2.1 Study design

This study was designed to gather target users' perceptions and experiences of using the POWeR website to understand factors that may be involved in users' (lack of) engagement with the weight loss website. Potential participants, i.e. overweight and obese RN personnel, were informed about the study via physical training instructors or recruitment advertisements. Interested participants emailed the researcher and were sent a participant information sheet (Appendix G). Participants still interested in taking part in the study contacted the researcher to arrange a mutually convenient time and date for the first phase of the study. In order to gain insight into users' perceptions of using the POWeR intervention, data collection took part in two phases. The first phase involved participants taking part in a face-to-face think aloud interview whilst using only the first session of the POWeR intervention (chapter 1 for a description of think aloud interviews). In the second phase, participants were contacted four to six weeks after having taken part in a think aloud interview for a follow-up telephone interview to gain insight into their perceptions and experiences of using the subsequent sessions in the POWeR intervention. If participants had not used any of the subsequent sessions, then participants' explanations for non-engagement were explored.

5.2.1.1 The web-based weight loss intervention

A brief description of the web-based weight loss intervention, namely POWeR, is presented in this section. Chapter 6 provides a detailed description of the website and the modifications based on chapters 4 and 5 that were undertaken to increase the website's relevance to overweight and obese RN personnel.

The POWeR website tested in this study consisted of 12 sessions, which had been designed to be accessed by users on a one-session-per-week basis. The first session was an introduction to the POWeR programme and guided users to choose an eating plan (low calorie versus low carbohydrate versus sticking with one's own eating plan). The subsequent sessions could be accessed in the following order: session 2 – getting support; session 3 – getting more active; session 4 – controlling your cravings; session 5 – dealing with slip ups; session 6 – stretching your physical activity; session 7 – busy lives; session 8 – when times are tough; session 9 – setting up your environment to help you lose weight; session 10 – being drink aware; session 11 – eating out; session 12 – maintaining your weight loss. Each session provided behavioural tools (e.g. goal setting, planning) that aimed to encourage behaviour change, in the form of the adoption of healthier dietary habits, and increasing levels of physical activity. New sessions could be viewed each time a user logged back into the website, regardless of whether it had been a week since the last time they had accessed the website. The advice given in POWeR is for users to login weekly, after trying to achieve their personal goals for a week. However, to conclude the think aloud interview when participants completed session one, the interviewer encouraged participants to access as many of the sessions as they liked until the follow-up telephone interview.

5.2.2 Recruitment

The study was advertised at three RN shore-based establishments in Gosport, Portsmouth and Fareham, UK (chapter 1 for information about the study setting). Initially, recruitment posters describing the nature of the study and eligibility criteria were placed on notice boards, and were circulated in daily orders (newsletter) in the naval establishments, namely, HMS SULTAN, HMS NELSON and HMS COLLINGWOOD (Appendix G). The recruitment posters specified that RN personnel could take part in a study to test a weight loss website if they had a BMI of at least 25, had access to a computer with internet for the next three months, and were concerned about their weight. In addition, five RN personnel with a BMI

over 30 who were to receive details about their upcoming appointment at the Fitness and Anthropometry Clinic (Gosport, UK) were sent participant information sheets and an invitation to take part in the study by post. None of the RN personnel with a BMI over 30 who were sent an information pack contacted the researcher.

Physical training instructors at HMS NELSON, HMS COLLINGWOOD and HMS SULTAN were then approached by the researcher, and were informed about the aims of the study. Physical training instructors were asked to approach RN personnel who met the inclusion criteria and to purposively sample from diverse demographic groups in terms of age, gender, living arrangements (i.e. on or off base), and years served in the RN. The involvement of physical training instructors in recruiting RN personnel proved to be fruitful: 14 participants were recruited by physical training instructors. All participants directly contacted the researcher, and we arranged a time and date where I met with participants at their respective bases to conduct a think aloud interview. Ethical approval was granted by the Academic Unit of Psychology Research Ethics Committee at the University of Southampton and the Ministry of Defence Research Ethics Committee (MODREC reference number: 258/Gen/11).

5.2.3 Data collection

During the think aloud interviews, participants were reminded about what their participation in the study would involve and written informed consent was obtained. All participants took part in a face-to-face think aloud interview that ranged from 50 minutes to 2 hours whilst using the first session of the website. The think aloud interviews allowed the researcher to observe how users interacted with the website, and to elicit their perceptions, opinions, and reasons for engaging (or lack of engagement) with the website. At the end of the think aloud interview, participants were informed that they would be able to access as many of the 11 sessions remaining in the website as they liked over the next four to six weeks. Participants were asked to make notes of any thoughts, opinions, or ideas related to their usage of the website on a hand-out that

was provided by the researcher (Appendix H). A time and date was arranged with each participant for when the researcher would call them for the follow-up telephone interview. To conclude phase 1, participants were given an optional form to provide their full name, date of birth, gender, ethnicity, marital status, and self-reported height and weight measurements (Appendix I).

In the second phase, participants were contacted by telephone for a follow-up interview (ranging from 10 – 21 minutes) to gather information about their experiences related to subsequent sessions they may have used since completing session 1 during the think aloud interview (phase 1). Participants who had not used any of the additional sessions ($n = 6$) were asked about why they did not find the website useful, if it was possible to contact them.

Participants were reimbursed £10 for taking part in both phases of the study following the completion of the telephone interview. This reimbursement was not advertised on the recruitment posters, as was required by the MODREC. Participants were made aware of this monetary compensation after they contacted the researcher. This was done to ensure that participants were signing up for the study out of genuine interest rather than for receiving the monetary compensation.

The interviewer travelled to the three RN bases to interview RN personnel. Data collection took place between December 2011 and April 2012. All interviews were conducted by the research student and were audio recorded with participants' consent. An interview guide was used during both interviews and further questions were asked depending on participants' responses to these questions. Illustrative questions asked in the think aloud and telephone interviews are presented in Table 10. A paid assistant experienced in transcribing transcribed all 23 audio recordings verbatim.

Table 10 Illustrative questions used in the think aloud and telephone interviews

Think aloud interview questions

- What are your first impressions of this page?
- Why did you choose that option?
- What do you think about [this activity; this information; this POWeR tool]?
- What do you think about following the recommendations [...concerning eating/physical activity/alcohol consumption etc.]?
- What do you think was good about the programme?
- What do you think should be changed?
- What else do you think might be useful?
- Overall, what do you think about the POWeR programme?

Telephone interview questions

- Could you tell me about how you've been getting on with using the POWeR website?
- Could you tell me which sessions you were able to use?
- Could you tell me about your experiences of session _____? (*this will depend on participant's answer to the previous question*)
- What were your thoughts on the information that you received in this session?
- Please tell me about any aspects that you didn't like in the session. What was it about these things that you did not like?
- Do you have any suggestions for improving the POWeR session?
- Please tell me about any parts of the session that you would recommend to other people. What was it about these parts that you liked?
- Did you experience any problems or difficulties when you were using the website?
- Overall, what do you think about the POWeR programme?

5.2.4 Participants

The 14 participants who took part in this study had not taken part in the studies reported in chapter's 3, 4 or 7. Although time and date arrangements were made for participants to take part in a follow-up telephone interview at the time of the think aloud interviews, of the 14 participants, only 9 participants could be contacted for a follow-up telephone interview. After a month of attempting to contact the remaining five participants, they were recorded as having dropped out of the study. In total, 23 interviews were conducted. One participant did not want to complete the demographic form; the demographic information presented is based on data from 13 participants. Recruitment terminated when no more participants could be followed up for a telephone interview.

5.2.5 Data analysis

The think aloud and telephone interview transcripts were analysed using an inductive thematic analysis approach to categorise the data (Braun & Clarke, 2006), using Nvivo 8.0 (QSR International Pty Ltd, 2009). In the face-to-face think aloud interviews, participants used only the first session of the POWeR website. The telephone interviews were conducted to gain insight into participants' experiences of using subsequent sessions of the website, which is why both sets of transcripts were analysed together in order to give a more complete view of participants' experiences of using the POWeR website.

The stages involved in the analysis are presented separately but it should be noted that inductive thematic analysis is an iterative process. The initial stages of analysis consisted of the researcher reading and re-reading each of the think aloud and telephone interview transcripts. Text in the transcripts was coded if it related to participants' experiences and perceptions of weight management and the weight loss website. A line by line coding approach was taken to code the first 8 think aloud transcripts and the first 4 telephone interview transcripts in parallel. All remaining transcripts were coded to identify initial codes that had not been

identified in previous transcripts. The initial codes were grounded in the data and participants' own words were used wherever possible. Based on the 23 transcripts, an initial list of 741 lower level codes was generated. These codes were grouped into 37 initial themes. Codes that were mentioned by only one participant and that did not fit within a theme were excluded. In an iterative process, the 37 themes were further grouped, and definitions and exclusion criteria for each theme were established to generate a coding manual. The final coding manual consisted of definitions and exclusion criteria for 10 major themes and their associated sub-themes with five of the major themes (Appendix J). The final stage of analysis involved examining how these themes were inter-related.

Two paper trails were kept throughout the coding and theme development stages. The purpose of the first paper trail was to make notes of key concepts grounded in the data and to ensure transparency of the coding process by keeping a record of the development of my interpretations of the codes, themes and the relationships between them. The purpose of the second set of notes was to inform the modifications to the web-based weight loss intervention.

5.2.6 Reflexivity

Issues were posed by being a young female interviewer, interviewing a predominantly male sample about their weight, as reported in chapter 4.2.6. Being both the researcher and the interviewer for this study, my perspective will have inevitably influenced the study design, development of the interview guide, development of the coding manual, data analysis, and reporting of the findings. My role as a researcher who had modified the website may have left some participants hesitant to raise their negative views related to the website or their reasons for not engaging with the website. On the other hand, my position as a research student, and an outsider to the RN context, may have been advantageous for ensuring that participants did not feel any obligation to engage with the website, if they did not want to. If the web-based intervention had been

provided by researchers in the RN, participants may have interacted with the website out of perceived pressure rather than any perceived usefulness of the website.

Compared to the quality and duration of the think aloud interviews, the follow-up telephone interviews were quite short and they did not yield as much in-depth and rich data about participants' views regarding their perceptions of the website. Nevertheless, data collection at follow-up appeared to reach saturation, as similar information was being generated by the interviews. Participants' similar backgrounds may have contributed to similarities in their views they expressed about the website. Therefore, the sample could be considered homogenous, potentially overcoming the problem with not being able to follow up all participants for a telephone interview.

5.2.7 Validity

Regular discussions with my supervisor, LY, took place to obtain critical feedback and to gain an outsider's perspective on the aforementioned stages. To address issues around rigour, credibility, and relevance of the qualitative study, a tool developed by the Critical Appraisal Skills Programme was used to guide the development and write-up of this study (Public Health Resource Unit, 2006). Rigour was achieved by the researcher providing an in-depth description of the data collection and analysis stages in this chapter. To ensure credibility of the findings, themes derived from the 23 interview transcripts were discussed with LY and in chapter 8, all other chapters are triangulated to reveal a more complete picture of overweight and obese RN personnel's perceptions and experiences of using a web-based weight loss intervention. The relevance and value of the study reported in this chapter is that the findings fill a gap in the literature of the views of non-adherent and non-engagers' perspectives on a weight loss intervention.

5.3 Results

This section presents 14 overweight and obese RN personnel's experiences and perceptions of using a web-based weight loss intervention, i.e. POWeR. All but one of the 14 RN personnel were male, all participants reported their ethnicity as white, and most participants were married ($n = 10$). Participants' ages ranged from 22 to 53 ($\bar{x} = 35$), and their self-reported Body Mass Indexes (BMI) ranged from 26-37 ($\bar{x} = 31.8$). The sample recruited consisted of personnel of lower ranks, i.e. ratings ($n = 11$) and higher ranks, i.e. officers ($n = 3$).

It was possible to determine the number of sessions participants accessed from automatically collected website usage data. Data revealed that in addition to using the first session of the website in a think aloud interview, eight participants used at least one more session of the POWeR website in their own time. Six participants used the website weekly, resulting in each of them accessing a further three sessions in their own time, for a total of four sessions that they accessed in the POWeR programme. One participant accessed three, and another participant accessed two sessions in total. Six participants only accessed the first session during the think aloud interview and did not access the POWeR website in their own time.

Only one of the participants that could not be contacted for a telephone interview had accessed the website three more times following the think aloud interview. Nine participants were contacted for a follow-up telephone interview. Seven out of nine participants reported having accessed one or more of the subsequent sessions of the website in their own time. When these participants were asked whether they would continue using the website, all but one said they would not continue using the website. Some participants ($n = 3$) stated that they had used the website because they were part of a research study. They stated that they perceived the study as being monitored by the RN, which suggests that these participants' usage of the website does not necessarily indicate that participants perceived the website as being useful, rather they perceived they were fulfilling their duty by using the subsequent sessions in the website.

It was not possible to contact one of the participants who had accessed additional sessions of the website for a follow-up telephone interview. Regardless of how many sessions they accessed almost all participants who were contacted for a telephone interview reported not wanting to continue using the website, which suggests they had an indifferent attitude towards the website.

Based on these observations, this sample could be described as partial- or non-engagers with the weight loss website. Table 11 presents participants' demographic characteristics, whether they were contacted for a follow-up telephone interview, and the total number of sessions participants accessed during the data collection period. Table 12 summarises the 10 major themes, and their associated sub-themes, that may be related to participants' experiences and perceptions of using the POWeR website.

Table 11 Participant characteristics

Participant No.	Gender; age; marital status	Contacted for a second interview	Total sessions accessed
1	(male; <i>incomplete form</i>)	Yes	4
2	(male; 22; single)	No	1
3	(male; 30; married)	No	4
4	(male; 29; married)	Yes	4
5	(male; 34; married)	Yes	1
6	(male; 37; married)	Yes	2
7	(male; 23; married)	No	1
8	(female; 26; single)	No	1
9	(male; 40; married)	Yes	4
10	(male; 29; married)	Yes	1
11	(male; 51; married)	Yes	4
12	(male; 37; single)	Yes	4
13	(male; 53; married)	Yes	3
14	(male; 41; married)	No	1

Table 12 Themes identified in the think aloud and telephone interview data

Major Themes	Sub-themes
Perceptions of weight	
Perceptions of weight management	Scepticism related to future attempts at managing weight Factors involved in weight management
Perceptions of and experiences with	

structured diets	
Reasons for engaging in exercise, increasing physical activity, and eating a more healthy diet	
Barriers to losing weight	Environmental factors Psychological factors Behavioural factors
Involvement of others in one's weight loss attempt	Types of involvement of others in one's weight loss attempt Attitudes towards the involvement of others
Perceptions of using the website and its content	Perceptions of the design, usability and usefulness of the website Trust versus scepticism Perceptions of website features and content
Technical issues with using the website Informing website modifications	Improving visual appeal, structure and reducing the length of the website Improving information provided and increasing the amount of feedback
Reasons for not engaging with the website	

In the following sections, 'most' refers to statements from 8 or more participants that informed the development of a particular theme. Similarly, 'some' refers to 5-7, and a 'few' means 4 or fewer participants mentioned examples related to the particular theme. Participant numbers have been provided to differentiate illustrative quotes, and TA has been used to indicate that the quote is from a think aloud interview transcript, while T means that the quote is from a telephone interview transcript.

5.3.1 Perceptions of weight

Most participants reported perceptions related to their weight and/or size. Some participants described themselves as being 'a big lad,' or 'a large bloke,' potentially implying that this was the way they had always been, which may indicate a fatalistic attitude towards their need to lose weight.

A few participants mentioned it was ‘too easy to put on weight’, and the potential reasons for having excess weight was generally attributed to not exercising enough and eating more than one needs.

“I had to turn around to [my partner] and say “We’re eating too much?”, “What do you mean?” and so I waited till the next night and so, basically we were having a curry or a bolognaise and I let her pile the plates on and I said “Look at that, you know, this is what we eat pretty much every night.” You know. And then we had a friend come over and she eats a lot less than we do and it’s like “Look this is how much she eats and this is how much we eat. There’s something totally wrong here. You know, we’re eating nearly twice as much as she is.” (Participant 5 – Think aloud (TA))

While some participants were quite serious and formal during the interviews, some participants used humour when talking about their weight. Using humour to talk about one’s weight may indicate that their weight was something they may take lightly or participants may have been attempting to ease the seriousness of the risks associated with excess weight. Regardless of participants’ reasons for using humour to talk about their weight, there may be implications to how participants approach weight management.

“My scales lie quite regularly.” (P3 - TA)

Some participants reported that they were taking part in the study to help them lose weight, suggesting that they may have been motivated to lose weight.

5.3.2 Perceptions of weight management

Some participants referred to times when they had tried various diets to lose weight but had not succeeded in maintaining a healthy weight. Participants who reported finding it hard to lose weight appeared sceptical about following a plan or programme in the future, to lose and maintain a healthier weight in the longer term.

“I think all diet plans that we looked at, whether it would be, my wife is on Weight Watchers, then she was on Slimming World, then she was going to

do celebrity, on Celebrity World, whatever it's called. And I think everybody's sceptical." (P6 - TA)

Most participants shared their views of the factors that they perceived as being involved in managing their weight. These included education and knowledge about how to manage weight, self-commitment and behaviours one was prepared to do, finding ways to keep weight management behaviours interesting, and engaging in behaviours that were perceived to enable weight management.

Some participants stated that they would like support in learning about specific behaviours they could do to lose weight. This participant was keenly browsing through the website to find out specific behaviours that would help him eat less:

"I think it is too easy to, like I was saying before, it is too easy for people just to say 'Eat less. Train more.' That's not really helping people out you know. Yeah, eat less I know that. I need help to eat less." (P5 - TA)

The importance of one's self commitment to weight management was discussed by some participants as a means for maintaining weight:

"I'm not sceptical because I think it's down to you as an individual; if you want to lose weight, you yourself, nobody else is going to make you do it." (P6 - TA)

One's commitment to weight management may also be related to the behaviours one was prepared to and not prepared to do for weight loss.

"I could go all week without having a slice of bread or pasta or anything. But I can't go all week without having a cake or a bag of crisps or a pie or something." (P3 - TA)

"I'm not having skimmed milk, because it's like dish water. There's a limit to what I'm prepared to do. That's where I draw the line." (P9 - TA)

For some participants, keeping weight management behaviours interesting and enjoyable were important for continuing one's efforts with weight management. Some participants talked about changing their exercise and training routines, in an attempt to keep their training experience interesting.

Behaviours participants mentioned that may enable weight management included making sure the television was off whilst eating, reading food labels, and keeping a healthy foods list visible and shopping for food based on this list.

Most participants mentioned factors related to managing one's weight that they themselves did not appear to *perceive* as a barrier to managing their weight but may decrease participants' likelihood of engaging in weight management behaviours. The perception that dieting may lead to under-eating, and focusing on exercise and physical activity rather than changing eating habits were common examples mentioned by most.

Some participants reported concerns over dieting, that it may lead to under eating. Participants gave low calorie and structured diets as examples for encouraging under eating. Participants also talked about how people 'ate with their eyes', in an attempt to describe people who ate more than they needed. Some participants referred to times when they had eaten more than they needed, as a result of what they perceived as an acceptable portion. Participants also talked about eating food just because it is accessible.

"If I was to, I mean, for instance go to the canteen or a place and there were sandwiches up front, I would generally tend to have a few of them because they were there. My wife wouldn't eat them because she's not hungry, or it's not her meal time." (P13 - TA)

Some participants mentioned that they would prefer to focus on increasing physical activity levels in order to lose weight rather than changing their eating habits. Participants who expressed a reliance on exercise to lose weight also mentioned looking into identifying ways to exercise without feeling tired, and making sure to change one's exercise routine to prevent the body from plateauing.

5.3.3 Perceptions of and experiences with structured diets

Participants reported various positive and negative outcomes as a result of trying out structured diets. Calorie counting diets were the most frequently reported diets participants had tried. About half of the participants who

reported experiences with calorie counting diets stated that calorie counting made them pay more attention to the calories in food. As a result of this awareness, participants referred to becoming conscious about what they ate. These participants used calorie counting as a guide rather than as a rigid approach to trying to calculate every single calorie they consumed.

“me personally if I have a basic knowledge of what food is good, what food is bad, what I should be eating more of, what I should be eating less of, then I don’t think you need to start adding up points. You know, I know a Mars bar is bad. I don’t need to know that it’s 10 points of my daily allowance of points.” (P12 - TA)

One participant reported that from time to time they were surprised about the calories in some foods that they had originally perceived as being healthy.

“That shocked me a little bit, that. Even the low fat yoghurts aren’t really, when you think about it, like, say it’s like 150 calories, it’s not really low is it” (P7 - TA)

On the other hand, participants who tried to follow calorie counting diets in a stricter sense, that is, those who tried to calculate the exact calories of everything they consumed, appeared to be dissatisfied with the ambiguity of not knowing the exact calories in food. Some participants mentioned the impracticality of calorie counting diets because they perceived it was not possible to control for every single calorie. Similarly, structured diets were also perceived as not being practical or well-suited for RN personnel’s lifestyle, which was reported as requiring a more flexible approach to changing one’s diet. One participant reported ‘being scared to eat’ when they were calorie counting because they did not want to go over their allowed calorie limit. These were participants’ explanations commonly given as reasons for abandoning these types of diets.

5.3.4 Reasons for engaging in exercise, increasing physical activity, and eating a more healthy diet

In this section, exercise and training refer to organised activities that aim to increase one’s cardiovascular fitness, such as going to the gym or taking part

in an organised sport. Physical activity refers to behaviours such as walking, cycling as a means of transport, and any movement that does not primarily set out to increase cardiovascular fitness. This distinction is made because most participants conceptualised training and exercise differently from physical activity.

Participants reported various reasons for engaging in behaviours associated with weight loss. Some participants reported engaging in exercise or physical activity, and eating a healthy diet, because of the enjoyment they experienced when engaging in these behaviours. Some participants reported feeling better about themselves after having engaged in these types of behaviours compared to when they did not exercise or when they ate unhealthily. In addition to these internally driven motivations for managing weight, a few participants reported liking the idea of keeping fit by engaging in behaviours they perceived would help them manage their weight.

“I just do it because I enjoy it and I like the idea of trying to keep fit.”
(P1 - TA)

Some participants reported externally driven motivations for engaging in behaviours associated with weight loss, such as a desire to pass the compulsory fitness test and wanting to be fit enough to play in a specific position in a team sport.

“... where I want to play [on the rugby team] I am way too big for that. Yeah, I've kind of, I won't, I've sort of went from being in the centres, now I'm pretty much like a flanker to be honest I'm pretty much a front rower and I really don't want to play there so...I don't play rugby. [...] but, it's not my place, not the place I want to play...” (P5 - TA)

Although externally driven, these motivations may also be partly internally driven due to participants' perceptions of themselves as being RN personnel and/or part of a team.

5.3.5 Barriers to losing weight

Participants reported perceiving barriers to losing weight that could be grouped as being environmental, psychological, and/or behavioural. Environmental factors include barriers to weight loss that participants reported which were above and beyond participants' control. The most common barrier to eating a more healthy diet reported was the lack of food options that were available in the RN dining services. Both in the RN and in the wider environment, the availability of tempting food made it difficult for some participants to make healthier choices in relation to food. One participant described the availability of unhealthy foods as being "in your face", which made it hard for him to ignore the temptation of certain options.

"... you're out and about and there's a McDonald's over there." (P2 - TA)

"A nice big shiny dessert staring at you from the canteen." (P9 - TA)

It was commonly reported that life events often got in the way of managing weight.

Some personnel reported that compared to unhealthy foods, healthy foods appeared more expensive, which put some participants off from buying healthier options. One participant who was using the planning section of the website wanted to plan a healthy meal that he would look forward to for the next day. Upon finalising his plan, he reported that he perceived that the meal would be more expensive than the unhealthy meal he would normally eat.

Psychological barriers included beliefs or perceptions that could pose a barrier to engaging in weight management behaviours. These include participants' attributions for their excess weight, their perceptions that excess weight was not a health risk, the belief that weighing was unnecessary, and their explanations for being unable to lose weight.

A few participants suggested that their excess weight may be genetic. A few participants questioned the appropriateness of BMI as a measure of identifying one's risk to develop obesity-related health problems. These participants mentioned that there was a discrepancy between the BMI one should be and what they perceived was realistically achievable for them.

“My BMI, [the nurse] is trying to tell me that I should be 11 stone 3, for someone who is 5’10 [...] and the least I’ve ever been was when I was in Iraq for 7 months, I came back 14.5 stones. And that was it. I couldn’t get any lower than that.” (P1 - TA)

One participant pointed out that they had been overweight for a long time and had not experienced any serious health problems. This participant concluded that “[being overweight] can’t be that bad.”

Some participants were resistant to the idea of weighing oneself on a weekly basis, as was suggested in the website. One participant did not want to know how much they weighed and another stated not wanting to focus on their current weight.

Reasons participants often gave for being unable to manage their weight included needing a getaway from the day’s stress and their perceived need for time to relax.

Behaviours that participants cited as barriers to losing weight included eating the foods they enjoyed, which tended to be high calorie and high fat foods.

“... having a few more beers and a kebab.” (P3 - TA)

“At the weekends when you drive by KFC on the way home, [...] I have a soft spot for KFC.” (P9 - TA)

One participant reported that they ate a bowl of crisps on days when they had done more exercise than usual as they felt that they had earned the right to have crisps.

“The bowl of Doritos was extra I suppose. I didn’t need them but, however, as I say, it’s a cycling day. ” (P13 - TA)

Snacking was reported as a common problem that participants perceived as a hindrance to losing weight.

“Snacking is my biggest downfall.” (P13 - TA)

5.3.6 Involvement of others in one's weight loss attempt

Participants reported times when health professionals, family and friends, and physical training instructors had become involved in their attempts to lose weight. The first sub-theme presents the types of involvement of others participants mentioned, followed by a sub-theme that presents participants' views of these interactions.

The interactions participants had with health professionals, family and friends, and physical training instructors about their weight loss could be differentiated as being passive or active. Passive involvement includes instances when participants had not asked for information about weight loss but were presented with this information. For example, participants who had gone to the see their doctor for various health conditions stated that they were sometimes told that they needed to lose weight and were given information about what they ought to be eating. Participants attending the healthy lifestyle club reported that the physical training instructor presented them with information on healthy eating and monitored their weight on a weekly basis. One participant talked about how from time to time they were presented with information from others that they described as using scare or shock tactics to try get them to lose weight.

Active involvement refers to times when participants sought information from others about weight loss. For example, a few participants whose partners were attending a commercial weight loss programme mentioned that they had also followed the programme together with their partner. They stated that this made it easier to plan for meals and they were able to help each other out. Other participants mentioned times when they had seen a nurse specifically to get support for their weight loss attempt, including topics about what to eat and ways to decrease their portion size.

Participants had positive and negative views about the involvement of others in their weight loss attempts. One participant stated that "people work against you or with you" when it came to managing one's weight. However, some participants' perceptions of their experiences with others could be interpreted as having both a positive and negative impact on their weight loss efforts.

Times when others' involvement had been perceived as unhelpful included being told how to lose weight or being given a structured diet when the participant had not asked for this information. Some participants recalled instances when they had experienced a health professional focusing only on their weight. When the participant had not lost any weight, the health professional only focused on where the participant had gone wrong with their weight loss and did not focus on any behaviour that may have been positive. A few participants stated that sometimes the information presented by physical training instructors in the healthy lifestyle classes was perceived as being too advanced and/or irrelevant to participants. As a result, these participants reported a tendency to switch off from paying attention to what the physical training instructors were presenting to them.

Some participants who had experience with being accountable to someone for their weight loss progress stated that this motivated them to stay focused on losing weight. A few participants reported that positive feedback from others especially encouraged them to continue with their efforts to lose weight. However, one participant reported negative feelings about their visit to the nurse to get weighed, suggesting that accountability, at times, may also lead to negative feelings in some participants.

Although in this study the website was not offered in tandem with any support groups for weight loss, one participant mentioned that when he was quitting smoking he did not and would not use support groups. He stated that changing behaviours for one's health should be an individual journey rather than a group experience.

5.3.7 Perceptions of using the website and its content

Participants reported views and perceptions of the appearance of the website, and the extent to which the website as a whole (i.e. not focusing on specific features) was perceived as being useable and useful. Data for this theme comes from both the think aloud interviews (TA; phase 1) and from participants' experiences of using the website in their own time that they reported in the telephone interviews (T; phase 2). Participants' references to recommending the website to others, or references to participants taking on

board the advice from the website, were taken to indicate that the website was perceived as being useful.

Participants described the website as being 'plain and simple' and 'organised'. The fact that the website was free of advertisements was positively commented on by almost all participants. Participants described the website as being self-explanatory and it was perceived as being different from strict and structured diets.

"It's not a controlling diet." (P10 - TA)

"It does what it says on the tin doesn't it? And being a serviceman that's what you want. You don't want nothing flowered up to be thinking "What are they asking me there?" That's what it says, and that's what you do.

And yeah, I think it was the right pitch and the right model. " (P6 - TA)

Some participants perceived the information provided in the website as common knowledge or a confirmation of what most people already knew about losing weight. Some participants perceived themselves as knowing how to lose weight and stated that the advice presented was repetitive and that 'information-wise there [was] nothing new' in the website. The participant who made this comment later suggested that the website would be useful for people who did not know how to lose weight or 'get fit' and that they would recommend the website to people who were just starting out with trying to lose weight and were 'clueless about weight loss'.

On the other hand, a few participants commented on learning new information and from time to time were surprised by the information they learned. One participant commented that they especially liked that the website contained information about the potential side effects of the eating plans, which they would not have thought to ask about. Other participants stated the website offered new tools that they had not previously come across for losing weight. In the follow up interviews, some participants reported having made behavioural changes as a result of using POWeR, such as not cooking more than they needed.

Some participants commented that the website could be a good tool to be used in tandem with medical and fitness personnel in the RN, giving personnel

with excess weight 'a bit of support and a bit of control' over their weight management efforts.

Some participants sought assurance about whether their use of the website would be monitored by a health professional and to what extent health professionals had been involved in developing the website. Due to the nature of the think aloud interviews, the interviewer did not give participants an answer to their question but reminded participants about the aims of the think aloud study, i.e. to report their thoughts aloud whilst using the website, to ignore the presence of the interviewer as much as possible, and to not expect any answers to their questions. Participants' questions may indicate that they were seeking information to determine to what extent they could trust the website. For example, it was unclear to one participant whether the answers to questions relating to the two eating plans in the website had been given by experts, which may have left him questioning the credibility of the answers provided.

One participant pointed out that he had come across information in the website that contradicted what he had previously known about the consumption of caffeinated drinks whilst trying to lose weight. It was not clear whether the participant was questioning the validity of the information presented in the website or whether he was surprised about the new information he had learned. Earlier on in the think aloud interview the participant had presented himself as someone who knew how to lose weight. He described the website as presenting him with information he already knew. This may suggest that this participant may be sceptical of the information presented as a result of his perceptions of himself as someone who knows how to lose weight.

Although most participants were content with the level of evidence provided to support the advice presented in the website, one participant felt that the evidence was insufficient and required additional statistical information to increase his confidence in the advice presented.

The website consists of a range of tools and features that are designed to guide users to become their own health coach for managing their weight in the long term. Participants' perceptions of the extent to which they found the following tools and features of the website useful are presented. These include

participants' views on the stories of others' experiences with weight loss, external links, email reminders, goal setting and planning tools, the food diary, and the eating plans.

Some participants reported finding stories of other people's weight loss experiences inspiring and useful, while other participants reported that these stories were not relevant to them and therefore were perceived as being unnecessary. One participant commented that they would be interested to learn about how long it had taken others to lose weight whilst using the website. One participant was interested in stories of people who did not like using the website.

"I'm sure you've probably got stories of people who didn't like [the website], have you?" (P6 - TA)

Some participants commented on the external links provided in the website, and liked that the website developers had selected trustworthy and useful websites for weight loss. Participants reported feeling positively about the reminder emails they received and described the reminders as giving users 'that little bit of oomph' needed to access the website. Nevertheless, not many participants actually accessed the website regularly.

Goal setting and planning were concepts that were familiar to some participants, and some reported experiences with using SMART goals (specific, measurable, attainable, relevant, and time-bound) in their work. These participants stated that goals were set to be achieved, and by achieving their goals they would be able to build confidence in their ability to lose weight. On the other hand, they also stated that when they did not reach their goal, they were likely to get upset with themselves.

Some participants stated that they were already achieving some of the goals suggested in the website. A few participants chose goals they were already achieving as the goals they would try to achieve for that week. Other participants reported not wanting to set goals or make plans, and perceived that goal setting and planning would not work for their weight loss. The generic goals given as examples in the website were disliked by a few participants as they did not find them relevant to their circumstances. Reasons participants discussed as to why planning and goal setting would not work

included examples of times when not planning had worked for weight loss and the impossibility of planning and preparing for every day.

The eating plans (low calorie versus low carbohydrate) were one of the main features of the first session of the website. Some participants found the process of deciding on an eating plan as lengthy and difficult, due to their desire to mix and match aspects of the two eating plans. For some participants deciding to choose the low calorie plan was straightforward as they reported strong feelings of dislike of any plan that restricted a particular food group. These participants reported that they anticipated difficulties when following the low carb plan and were concerned that the potential side effects reported in the website would interfere with their daily tasks in the RN. Participants who described themselves as meat lovers took more positively to the low carbohydrate plan. A few participants reported that they found the eating plans too vague and stated that they wanted to know exactly when and what they should consume.

In the *reasons to lose weight* section of the website, the website suggests that some people may want to lose weight to feel better about themselves and/or to increase their confidence. A few participants commented on this by saying that they did not need to lose weight for these reasons, and that these suggestions were not relevant to them.

“Yeah, it was a section about feel good, lose weight, look good, feel good all that kind of stuff. I think we’re dealing with, again this is just my personal view, but we’re dealing with forces personnel, I don’t think we necessarily have a problem with self-confidence and it’s, you know, we know why we need to lose weight and we know why we are doing it. Looking good, and feeling good and being attractive and sexy and that kind of stuff isn’t really part of the reasons why we lose weight and it kind of made me just roll my eyes a bit.” (P12 - TA)

5.3.8 Technical issues with using the website

From time to time participants reported technical issues with using the website, which may have influenced their engagement with the website. Slow internet connectivity in the RN was commonly reported and was also offered as

an explanation by some participants as to why they had postponed accessing the website to when they could access it from their home computers. However, some participants reported that they were able to find the time to use the website while they were on their work computers at a RN base. It is worth noting that whether personnel have access to a computer at a RN base depends on their post. For participants who did not have access to a computer during working hours, the only time for them to use the website would be during the evenings or at weekends.

One participant who found it difficult to make time to access the website suggested whether a paper-based version of the website would be more useful. On the other hand, some participants liked the idea that the weight loss programme was in the form of a website. One participant reported having problems logging back into the website via the link provided in the automatic emails.

5.3.9 Informing website modifications

Participants had a variety of suggestions for modifying the website to improve its visual appeal and to increase the relevance of the content to better meet the needs of RN personnel with excess weight wanting to lose weight.

Most participants stated that the website could include more visual images to improve the website's appearance. Their suggestions included images to illustrate portions of various foods, having motivational pictures such as personnel exercising in the RN, having the RN logos on every page instead of only on the homepage. One participant also suggested that using RN colours in the website may make the website perceived as being the property of the RN.

One participant stated that they would have preferred to see more pictures rather than text, which may imply that they perceived the website to be too wordy. Many participants shared this idea and reported that the website could benefit from a reduction in the length of some of the content.

“If it can be said in one sentence, say it in one sentence.” (P11 - TA)

Some participants had ideas about how to restructure session 1, including introducing goal setting earlier on in the session, having the reasons to lose weight card at the start of session, and recording one's weight at the start of the session rather than at the end.

One participant who was keen to self-monitor their diet and physical activity suggested that they would have liked the option to be able to log their diet and physical activity daily on the website in a diary that was embedded in a calendar.

A few participants suggested including a reflection section to accompany the goal-setting and planning tools so that participants could reflect on what had worked for them in achieving their goals or to be able to monitor their reasons for not being able to achieve their goals.

One participant stated that having the motivational emails sent later on in the week would have been more useful than receiving them a few days after they had completed a session.

In this study, the website was offered as a standalone resource for participants to use, first in a think aloud study and then in their own time. Some participants stated that they would prefer more human involvement to provide users with feedback on their food diaries and to provide ongoing support, which they perceived would improve their own engagement with the website.

Participants had a range of requests for improving the content of the website including information about the different types of weight loss drugs and how long it had taken people to lose weight using POWeR whose testimonials were presented in the website, and information about where to buy cheap fruit and vegetables from local supermarkets.

Some of the requests participants made were already accessible in the website, such as links to healthy menus, information about increasing physical activity, wanting a fat-losing website rather than a weight loss website. One participant, who was finding it difficult to come up with their own goals for weight loss, stated that "goals are too flowery, just tell me what to do." One participant could not specify what it was that was missing from the website but

they concluded that “[the website] needs something extra to pull in the general everyday forces guy”.

5.3.10 Reasons for not engaging with the website

Participants reported internal as well as external reasons as to why they did not engage with the website. Internal reasons participants listed included ‘becoming lazy,’ ‘just giving up,’ and not wanting to do anything for weight loss. One participant stated that the website had not worked for them. Another participant reported that they were initially enthusiastic about the POWeR website but that afterwards this enthusiasm disappeared. The participant reported that they did not know why this enthusiasm had disappeared when asked to elaborate on their statement.

External reasons participants reported for not engaging with the website were being busy with work, becoming involved in a different diet programme for building muscle, and being unable to follow the website when they were not accountable to anyone. The participant who had started following a different diet programme stated that they did not perceive the POWeR website would be useful for building muscle and therefore abandoned it. One participant stated that the reason why they did not use the website again was because they had been unable to sign in. The fact that this person did not try to contact the researcher suggests that they may not have been motivated to use the website. One participant discontinued using the website because of a physical injury. Some participants reported that they intended to use it but were waiting for a time when they would not be as busy in their lives. Some participants said that they would have used the website if they were paying to use the website, or if the website were made compulsory. It was possible to monitor participants’ usage of the website and it became apparent that the participant who said that they would continue using the website, did not use the website after the follow-up telephone interview.

5.4 Discussion

This study explored overweight and obese RN personnel's views of a weight loss website, half of whom did not engage with the website after the first session. All but one of the participants who did access some sessions in their own time stated that they were not planning on accessing the website in the future. It is worth noting that six months after data collection had ceased, none of the participants had accessed the weight loss website. Therefore, findings may fill a gap in the weight loss literature of the experiences and perceptions of non-engagers with a web-based behavioural weight loss programme.

Studies of people's perceptions and experiences with behavioural weight loss programmes generally focus on participants who engage with the intervention (Curioni & Lourenco, 2005; Franz et al., 2007; McConnon, Kirk, & Ransley, 2009; Tate, Wing, & Winnett, 2001). It is rarer to find data on people's reasons and explanations for not engaging with a programme. There may be a selection bias where people who are not interested in using a behavioural weight loss programme may be less likely to volunteer to take part in a study to use the intervention. This leaves a gap in health researchers' and health professionals' understanding of overweight and obese people's reasons for not engaging with behavioural weight loss programmes. The perceptions and experiences of non-engagers with behavioural weight loss programmes are also relevant and important for furthering our understanding to improve and develop approaches to support people to lose weight. Findings from this study may help develop a preliminary understanding of overweight and obese RN personnel's views of a weight loss intervention.

5.4.1 Implications for understanding reasons for non-engagement with the website

This section will discuss how the findings of this study may explain reasons for participants' lack of engagement with the website. It is important to note that the majority of this study's sample was identified by physical training instructors, which may have implications for participants' motivation for taking part in the study. Although all participants wanted to lose weight, some

participants may have been extrinsically motivated to lose weight, rather than wanting to lose weight due to intrinsic motivations. Extrinsic motivation refers to motivation that is driven by external factors, while behaviour that is motivated intrinsically is carried out for the inherent enjoyment or interest. Overweight and obese RN personnel who fail their annual RN fitness test risk losing their job unless they get fitter and pass the fitness test. Most of the participants in this sample had failed their fitness test. It would appear then that some participants' desire to lose weight may have been extrinsically driven, i.e. to pass the RN fitness test and to secure their employment in the RN. The Self-Determination Theory suggests that people have an inherent need for autonomy, competence, and relatedness (Deci & Ryan, 1985). The extent to which an individual is able to satisfy these psychological needs in the RN may influence their autonomous motivation to engage in behaviours to lose weight.

Some participants' lack of engagement with the website may be related to their acceptance of their excess weight. Some participants' acknowledgement of themselves as a 'large bloke' may not necessarily indicate an acceptance of being overweight or obese, instead this internalisation may be a way of distancing themselves from the need to lose weight by perceiving themselves as being larger, without necessarily needing to lose weight. This is in line with previous studies that have found that some overweight men perceive themselves as being at a healthy weight (Chang & Christakis, 2003; Lemon, Rosal, Zapka, Borg, & Andersen, 2009).

A few participants raised concerns about the risk of under-eating in an attempt to follow the dietary suggestions made in the website. These participants were referring to personal experiences where they had purposefully eaten less than the diet recommended. However, all participants reported abandoning this strategy. Failed dieting experiences may leave some people feeling discouraged from making future dietary changes (Elfhag & Rössner, 2005; Garip & Yardley, 2011).

The focus of the website content was primarily on providing dietary advice, rather than focusing on physical activity and exercise to manage one's weight. Both this sample and participants that took part in an interview reported in chapter 4 suggest that the RN culture emphasises physical activity and exercise as opposed to having healthy eating habits in order to maintain

fitness levels. Interviews with civilian men also suggest that dieting or making dietary changes are more likely to be perceived as feminine activities (De Souza & Ciclitira, 2005). Therefore, some people may need to be educated about the importance of diet in attempting to manage weight.

Some participants mentioned that there were certain behaviours that they were prepared and not prepared to do in order to manage their weight. Exploring the behaviours overweight and obese RN personnel perceive as acceptable and feasible may have important implications for developing individually tailored weight management programmes to support them to lose weight. Participants who mentioned that one's weight management efforts were more likely to be continued as long as the behaviours were enjoyable, suggests that behaviours that may bring about feelings of deprivation may lead some participants to abandon their efforts to lose weight. Behaviours associated with weight loss and weight management, from time to time, may bring about feelings of deprivation in some people. Some participants' reasoning for abandoning behaviours to lose weight, i.e. not being enjoyable, may need to be challenged and alternative sources of enjoyment could be identified.

The reasons some participants gave for being unable to manage their weight included needing a getaway from the day's stress and their perceived need for time to relax. This implies that watching what one eats interferes with relaxing and getting away from the day's stress. These participants may need to be taught alternative ways of relaxing and relieving stress, which the POWeR programme does include.

A participant who was finding it difficult to come up with their own goals for weight loss stated that "goals are too flowery, just tell me what to do." This suggests that some users may not prefer taking control over their weight loss, rather they may benefit from a more structured approach to changing their behaviours to lose weight.

One participant pointed out that they had been overweight for a long time and had not experienced any serious health problems. This participant concluded that "[being overweight] can't be that bad." This outlook on one's weight status may leave the person unlikely to engage in weight management

behaviours. Better information on the effects of being overweight may be needed to make informed decisions about dietary changes.

Some participants were resistant to the idea of weighing oneself on a weekly basis, as was suggested in the website. One participant did not want to know how much they weighed and another stated not wanting to focus on their current weight. These participants appeared to be resistant to taking on board the information presented in the website, suggesting that they may not want to lose weight.

5.4.2 Implications for the Royal Navy

The RN was interested in evaluating the feasibility of implementing a web-based weight loss programme for overweight and obese personnel. If the website were found to be useful, the RN envisaged offering it as an optional tool that could be used in conjunction with existing services in the RN (chapter 1 for a description of weight loss services in the RN). Based on participants' views and experiences of attempting to lose weight in the RN (chapter 4), an existing web-based weight loss intervention was modified to support overweight and obese personnel in their weight loss efforts (chapter 6). In this study, overweight and obese RN personnel reported their views and experiences of using the modified website.

The majority of participants were indifferent towards the website. Some RN personnel reported that they would have been more likely to use the website if it was compulsory for overweight and obese personnel. This suggests that these personnel may have perceived the website as an optional tool to support their attempts to lose weight and did not feel obliged to use the website. The intervention aims to support users by giving them tools to self-manage their weight, with the assumption that weight management is a personal responsibility. By making the website compulsory, it might be argued that users' responsibility for their weight management may be undermined and instead the RN may be taking on its overweight and obese personnel's weight management responsibilities. As previously mentioned, participants' suggestions for making the website compulsory may also be indicative of their motivation to lose weight being extrinsically driven. In other words, some

participants in this sample are unlikely to have intrinsic motivations for losing weight.

From the RN's perspective, all personnel need to maintain minimum levels of physical fitness to effectively carry out their duties. For overweight and obese personnel in the RN, the need for managing one's weight is not optional. Therefore, the possibility of enrolling the website as a compulsory tool should be considered by the RN. In addition, there appears to be a need to introduce interventions for increasing RN personnel's motivation to lose weight, as this was identified as a barrier for some personnel to engage with the website.

Participants reported focusing on engaging in exercise and being physically active in order to achieve physical fitness. This is similar to findings reported in chapter 4. The emphasis on achieving physical fitness through training can be observed in the sports centres on RN bases and in the gyms on ships. The website content was mainly focused on dietary advice. In the RN culture, there appears to be little emphasis on dietary recommendations and how it relates to physical fitness. An intervention at an institutional level to raise personnel's awareness of the importance of nutrition to achieve physical fitness may increase the relevance of the website from participants' perspectives.

A fruitful strategy for recruiting participants to this study involved liaising with physical training instructors. Physical training instructors were able to identify and approach personnel who met the eligibility criteria for taking part in this study. Physical training instructors' involvement and interest in the study was therefore integrated into the study design for the pilot study evaluating the feasibility of implementing the web-based weight loss programme among overweight and obese RN personnel (chapter 7).

5.4.3 Implications for the web-based weight loss programme

Participants' overall minimal engagement with the website suggests that the implementation of the intervention as a standalone website to support weight loss among overweight and obese RN personnel is unlikely to be well received.

The addition of some personal (human) support may be crucial for encouraging overweight and obese RN personnel to engage with and adhere to the website (Svetkey Lp & et al., 2008). In chapter 7, a pilot study evaluating the feasibility of implementing the website in the RN with minimal support from physical training instructors is presented.

Participants raised various ideas for modifying the website. Some of the suggestions participants made already existed in the website. For example, links to healthy menus, information about ways to increase levels of physical activity, and wanting a fat-losing website rather than a weight loss website. The fact that some participants missed this information suggests that either the information could be presented in a more prominent way to make it easier for users to notice, or that participants were not paying much attention to the content of the website.

Based on participants' feedback in the follow-up telephone interviews, it became evident that the sessions of the website ought to be made accessible on a more flexible basis. In the version of POWeR participants used in this study, if a user wanted to access the topic covered in session 8, they would have to access the website at least 8 times and have completed all the previous sessions. In the version of POWeR piloted in the study presented in chapter 7, users were able to access any session each week, after completing the first two introductory sessions of POWeR.

Although the website includes some elements of motivational interviewing techniques (Miller & Rollnick, 2002) that aim to increase participants' intrinsic motivation, the website has been designed to be used by people who are already intrinsically motivated to lose weight. It would appear that the majority of participants may have benefited from more intensive motivational interviewing techniques in order to resolve any ambivalence they may have had about wanting to lose weight and to become more intrinsically motivated to lose weight.

5.4.4 Limitations

Similar limitations reported in chapter 4 are also relevant to this study. The fact that not all participants had equal access to computers may have limited some personnel from accessing the website as often as they would have. In fact, most of the participants who were able to access subsequent sessions of the website had a role in the RN that meant they had access to a computer during working. Personnel who do not have access to a computer during working hours may need to factor in time during the evenings or on weekends in order to access the website. The fact that most participants accessed the website during working hours and not during hours out of work suggests that these participants may have perceived their use of the website as part of their responsibilities to the RN.

It would have been ideal to conduct face-to-face think aloud interviews using every session of the website, however due to time limitations this was not possible. Instead, participants' retrospective views of the remaining sessions were gathered in a follow-up telephone interview. The average duration of each follow-up telephone interview was quite short and mainly consisted of participants' reasons for not using the website. Participants' reasons for non-use could be described as a list of excuses as to why they did not or could not use the website. As a result, participants' in-depth views of the remaining sessions are likely to have been missed. Furthermore, the majority of the latter sessions were not accessed by participants, potentially missing the opportunity to gain participants' overall impressions of the website and obtain suggestions for modifying these sessions. It is also worth noting that not all participants could be contacted for a follow-up interview, resulting in a smaller sample size for the second part of the study. However, the sample was quite homogenous, i.e. most participants were of lower ranks who appeared to report similar attitudes and perceptions of weight management and about the website. The hierarchical structure of the RN may have led some personnel of lower ranks to feel obliged to take part in a study that was tasked by the RN. It is unclear whether participants' reasons for taking part in the study were to lose weight and/or to contribute to a research study that was sponsored by the RN.

5.4.5 Future research

It is important for researchers and health professionals to be able to identify psychosocial factors that may distinguish overweight and obese RN personnel who are unlikely to engage with web-based weight loss programmes. Further research is needed to identify sustainable ways for increasing personnel's intrinsic motivation to lose weight, such as implementing intensive motivational interviewing techniques.

Some participants suggested making the website compulsory for overweight and obese personnel, as a way of ensuring that personnel who need to lose weight are more likely to use the website. There are ethical implications around forcing personnel to use the weight loss website. However, personnel in the RN engage in various compulsory activities and duties on a daily basis, which may make the compulsory nature of the website more acceptable. This strategy is likely to increase personnel's extrinsic motivations to use the website but is unlikely to foster intrinsic motivation for using the website. It may be worth exploring the effects of offering the website on a compulsory basis and the impact it may have on users' engagement.

Further research is warranted to identify ways to optimise the content and implementation of a web-based weight loss intervention for overweight and obese RN personnel that balances users' personal responsibility for their weight management, while providing sufficient support from the RN. Research is also needed for refocusing the RN's emphasis on physical activity and exercise for achieving physical fitness to also include awareness of nutrition and diet.

5.4.6 Conclusion

This study presented the perceptions and experiences of a predominantly male group of overweight and obese RN personnel who partially engaged with a website to support their weight management efforts. Overweight and obese RN personnel's perceptions of an intervention to support weight loss, and their views of weight and weight management may explain the decision-processes

related to users' lack of engagement with the website to support their weight loss efforts.

Personnel who reported that they would have been more likely to engage with the intervention had the website been compulsory may demonstrate the mind-set of some RN personnel who have become accustomed to engaging in behaviours based on the orders they receive. There may be unwillingness among some overweight and obese RN personnel to take personal responsibility to manage their weight. Additionally, overweight and obese RN personnel have various resources to support their weight management (e.g. physical training instructors, nurses to support weight management), which may have reduced the appeal of a website to support their weight management. Some extent of human involvement in future implementations of the website may encourage some overweight and obese RN personnel to be more motivated to engage with the website to support their weight management efforts.

6. Using theory and user-input to systematically modify an existing web-based weight loss intervention

6.1 Introduction

Evidence from preceding chapters (2, 3, 4, and 5) is brought together to present a detailed account of the modifications to an existing web-based weight loss intervention for implementation in the Royal Navy (RN). It has been necessary to modify the existing intervention due to contextual differences between the sample targeted for the existing weight loss intervention and the RN environment. This chapter starts by providing a brief description of the existing intervention, and then explains how the intervention was modified for use in the RN by drawing on theory and user input.

6.1.1 Background information about the existing web-based weight loss intervention

A web-based weight loss intervention titled POWeR (Positive Online Weight Reduction) was developed by a team of researchers at the University of Southampton using LifeGuide (software for developing interventions; www.lifeguideonline.org), to support overweight and obese people in primary care wanting to lose weight. Preliminary studies have found that the POWeR intervention has been positively received by samples from the general population (Yardley et al., 2013). The POWeR intervention aims to help users self-manage their weight in the long-term by teaching them to use behaviour change techniques that have been identified as key ingredients for successful behavioural weight management, including self-monitoring, goal setting, and restructuring negative cognitions (Klein et al., 2004; Shaw et al., 2005). The components of the intervention were derived from theoretical frameworks, principally Cognitive Behaviour Therapy and the Self-Determination Theory (Deci & Ryan, 1985), in order to increase users' skills to self-regulate their behaviours for managing their weight.

Prior to developing POWeR, semi-structured interviews were carried out with people interested in losing weight to understand their perceptions and experiences of weight management (Garip, 2010). The main findings which influenced the non-prescriptive and flexible design of the POWeR intervention were related to participants' perceived reasons for being unable to adhere to diets; these reasons included feeling deprived as a result of food restrictions, being unable to incorporate necessary changes into their lifestyle, and the effort required to track calories (Yardley et al., 2013).

During the development of the POWeR intervention, think aloud interviews were conducted iteratively with obese people from the general population to ensure that the intervention met target users' needs, expectations, and capabilities. The main findings from the think aloud interviews were that, while some participants were able to utilise the behaviour change tools for setting plans and goals, others required further explanations and examples of how to set realistic and achievable behavioural goals for achieving successful weight management. These interviews also suggested that the POWeR intervention was well received by participants and had the potential to equip users with the skills for maintaining a healthy weight in the longer-term (Yardley et al., 2013).

6.1.2 Behaviour Change Techniques in POWeR

The POWeR intervention incorporates a variety of behaviour change techniques that have been associated with successful behavioural weight management, including self-monitoring, goal setting, and restructuring negative cognitions (Klein et al., 2004; Shaw et al., 2005). This section describes the most prominently featured behaviour change techniques and illustrates how they are utilised in POWeR for self-regulating weight, namely, cognitive behavioural techniques (Beck, 1976), forming intentions (Gollwitzer, 1999), goal-setting, self-monitoring (Baker & Kirschenbaum, 1993), reviewing behavioural goals, and providing feedback on performance (Health Promotion Effectiveness Reviews, 1997).

Self-regulation has been described as a process where the individual monitors their progress towards a goal, by reviewing the outcomes of behaviour, and modifying behaviours if the desired goal has not been achieved

(Zimmerman, 2000). Cognitive behaviour techniques are examples of self-regulation. The remaining behaviour change techniques are described separately; however, their contribution to the self-regulation of weight management behaviours is likely to be interrelated.

Cognitive behaviour therapy (CBT) involves exploring and restructuring maladaptive cognitions to reduce dysfunctional behaviours and emotions (Beck, 1976). Cognitive behaviour techniques may be aimed at changing cognitions, or may focus on altering behaviours. CBT has been widely applied to various health conditions, including the management of excess weight. Research suggests that interventions that incorporate elements of cognitive behavioural techniques appear to be more effective than behavioural weight management interventions that do not include these techniques (Berkel, Carlos Poston, Reeves, & Foreyt, 2005). The POWeR intervention includes sessions that aim to help users identify triggers to maladaptive behaviours, such as overeating in response to negative emotions, and guides users in how they may plan to overcome these behaviour patterns in the future.

Goal-setting provides structure, and focuses the individual's attention, for attaining a desired outcome. Forming implementation intentions takes goal-setting a step further by prompting the individual to make a specific plans (when, where, and how) for achieving the desired goal (Gollwitzer, 1999). In every session of POWeR, users are given the opportunity to set dietary and physical activity goals, and are instructed to make detailed plans for achieving these goals. Some evidence from the think aloud interviews suggested that civilian users struggled with this concept of setting detailed plans for achieving one's behavioural goals related to weight management (Yardley et al., 2013). For this reason, a series of detailed examples of goals and plans are presented in POWeR to illustrate this technique.

Self-monitoring refers to individuals tracking their behaviour, in order to identify adaptive and maladaptive behaviours related to achieving a desired goal. At the start of each session in POWeR, with the exception of the first session, users are prompted to enter their weight, and rate and review how frequently they achieved their goals during the previous week. Users also have the option of monitoring their dietary intake and physical activity levels. This

gives users the opportunity to review whether they are achieving their goals. The aim of this technique is to make users aware of their behaviours.

POWeR is programmed to provide users with tailored feedback based on how frequently they were able to achieve their goals and changes in their self-reported weight. A participant who loses weight and achieves most of their goals receives a congratulatory message, encouraging them to keep up the good work. A participant who does not report any weight loss but reports having achieved most of their goals receives a message that encourages them not to be disheartened by not having lost weight, and congratulates the user for achieving their goals. A participant who loses weight but does not report achieving their goals receives a message that asks the user whether it was by chance that they lost weight as they had not achieved their goals. A participant who has not lost weight and has not achieved their goals receives a message that acknowledges that it is common for people from time to time to be unable to stay on track with their goals, and they are encouraged to either continue with their goals from the previous week or to set new goals that may be more achievable and realistic for them.

6.1.3 The content of the POWeR intervention

The POWeR intervention consists of 12 sessions that are designed to be accessed on a once-per-week basis. In the first session, users are presented with an introduction to the POWeR programme before selecting a non-prescriptive eating plan. Then users set goals and plans that will help them adhere to their chosen eating plan, and at the end of the session they enter their weight. At the start of each subsequent session, users enter their weight and rate how often they were able to achieve their goals and have the option of setting new goals and plans. The first two sessions have been designed to familiarise users with the POWeR intervention and to help users identify sources of support. The order in which subsequent sessions are accessed is determined by the user. An overview of the sessions in the POWeR intervention, with brief descriptions for each session, is presented in Table 13.

Table 13 An overview of the POWeR sessions

Session No.	Session title	Brief description
1	Introducing POWeR	Introduces users to what to expect from POWeR; users choose between a non-prescriptive low calorie and a low carbohydrate eating plan; users set plans and goals to support their weight management; users fill-out a reasons to lose weight card.
2	Getting support	Gives information about how users can support themselves using the website and how to get support from other people, including family and friends.
3	Getting more active	Users are encouraged to fit in more physical activity into their everyday lives; gives examples of how others have increased their levels of physical activity.
4	Controlling your cravings	Guides users to identify negative thoughts and to create positive thoughts; gives examples of strategies others have used to overcome cravings; users fill-out a list of distractions that they use when they get a craving.
5	Dealing with slip-ups	Users are guided to learn from their mistakes by identify triggers and planning what to do next time the trigger presents itself; explains to users how thoughts are not facts.
6	Stretching your physical activity	Informs users about the benefits of increasing physical activity and guides users to identify times during their daily routine to engage in more physical activity.
7	Busy lives	Users are given examples of how others have planned their meals so as to not stray away from their healthy eating plan during busy times; users are prompted to identify their priorities in order to better manage all their tasks at hand.
8	When times are tough	Gives users tools that can be used to fight stress or when a user is going through a difficult time, including identifying activities to lift one's mood, relaxation techniques, and a stress diary.
9	Setting up your environment to help you lose weight	Presents users with examples of how they can set up their environment to be more active and to help them eat less.
10	Being drink aware	Guides users to identify drinking habits and change them in-line with their plan for reducing their weight.
11	Eating out	Presents users with information about portion sizes, the relationship between

12	Maintaining your weight loss	seeing food and eating food, and tips to eat slowly. Users are reminded about the importance of setting goals and plans; users can set up motivational messages to themselves; an optional pros and cons table can be completed for losing weight/maintaining a healthy weight.
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The next section describes how the preceding chapters (2, 3, 4, and 5) have contributed and informed modifications to the POWeR intervention for use among overweight and obese RN personnel. In the interest of clarity, the version of the POWeR intervention modified for users in the RN will be referred to as POWeR-RN.

6.2 Stages involved in modifying the POWeR intervention to develop POWeR-RN

A summary of the stages involved in modifying the POWeR intervention to develop POWeR-RN is presented in Table 14.

Table 14 An overview of the stages involved in developing POWeR-RN

Stages	Aims & Methods	Findings	How the findings informed POWeR-RN
1	Survey study to determine the prevalence of overweight and obese personnel in the RN, and to assess their	There were high rates of overweight and obese RN personnel, with some sub-groups expressing an interest in using a weight loss intervention.	Indicated potential role for POWeR-RN.

	receptiveness to using a web-based weight loss intervention (chapter 3).		
2	Systematic review and synthesis of qualitative studies investigating the weight management experiences of overweight and obese people (chapter 2).	Twelve factors were derived that overweight and obese people perceived as relevant to weight management.	Provided framework for checking that POWeR content incorporated factors overweight and obese people perceive as relevant to weight management.
3	Mapped the contents of POWeR to the 12 factors identified in the systematic review (Table 15, chapter 6).	The content of the POWeR intervention mapped onto the 12 factors, suggesting that the POWeR intervention included components that overweight and obese people perceived as being relevant to their weight management attempts.	Confirmed that POWeR content could be mapped on to factors overweight and obese people perceive as relevant to weight management. No modifications undertaken at this stage.
4	Interviews with overweight and obese RN personnel to understand their experiences of weight management in the RN (chapter 4).	There were perceived constraints in the RN environment related to dietary options and making time for physical activity. Lack of knowledge and motivation were also reported as reasons for being unable to maintain a healthy weight.	Modifications to the content of POWeR took place between May – October 2011, mainly to improve the relevance of POWeR-RN for overweight and obese RN personnel.
5	Thinkaloud interviews with overweight and obese RN personnel to assess their perceptions and usage of POWeR-RN (chapter 5).	The physical activity session did not meet the needs of users as it was too rudimentary. At most participants used the first three sessions of the intervention, which may have been due to a lack of human monitoring and	Modifications took place between June – August 2012. The session on ‘Getting more active’ was excluded from POWeR-RN. Face-to-face support from physical training instructors was incorporated for the subsequent study

encouragement.

(chapter 7) in order to increase users' adherence to the website.

6.2.1 Stage 1: Contributions of the survey study for developing POWeR-RN

A survey was conducted with a large, stratified sample of RN personnel ($N = 1030$), in terms of age, gender, and rank, to explore their intentions and perceived behavioural control beliefs to lose weight and to use an interactive weight loss website. The aim of this survey was to determine whether there was scope in the RN to implement a web-based weight loss intervention, i.e. the POWeR-RN intervention.

Participants rated their intentions and perceived behavioural control to lose weight and to use a weight loss website on a 7-point Likert scale (responses ranging from: 1 = strongly disagree to 7 = strongly agree). The main findings from this formative study were that the majority of participants ($n = 740$, 72%) reported intending to lose weight, and some of those reporting intentions to lose weight also reported a lack of confidence about losing weight ($n = 153$, 28%). The majority of participants reported feeling confident to lose weight but compared to participants with a healthy BMI ($\bar{x} = 5.85$, $SD = 1.19$), overweight ($\bar{x} = 5.52$, $SD = 1.41$) and obese ($\bar{x} = 5.42$, $SD = 1.40$) participants were less confident about losing weight ($F(2, 815) = 6.20$, $p < .01$). Of the participants intending to lose weight, 79% ($n = 650$) reported feeling confident about using a web-based weight loss intervention.

The findings from this study suggest that there may be a role for implementing the POWeR-RN intervention among overweight and obese RN personnel wanting to lose weight. However, it is unlikely that the intervention would be well received by most overweight and obese RN personnel. In the RN, overweight and obese personnel already receive a considerable amount of support from physical training instructors for increasing levels of physical activity. For example, it is compulsory for overweight and obese personnel to meet once a week with physical training instructors, who monitor their progress on a tailored exercise programme. Additionally, overweight and

obese personnel are obliged to attend Healthy Lifestyle classes that are led by physical training instructors on a weekly basis (section 1.2.3), which involves engaging in various team sports and exercises. Dietary information and advice do not appear to be incorporated within this source of support. The POWeR-RN intervention may serve as an easily accessible resource that focuses on dietary advice to complement support provided by physical training instructors. POWeR-RN may particularly be useful to some personnel who intend to lose weight, lack the confidence to do so, and are interested in using a web-based intervention to support their weight management attempts.

6.2.2 Stages 2 & 3: Contributions of the systematic review for developing POWeR-RN

Ideally, a review of overweight and obese adults' perceptions and experiences of web-based weight loss interventions would have been formative for the development of the POWeR intervention, and for modifications to develop the POWeR-RN intervention. However, based on literature searches there were insufficient numbers of published articles on this topic to conduct a systematic review. A systematic review and meta-ethnography was conducted to identify overweight and obese adults' perceptions and experiences related to weight management, primarily in the context of behavioural weight management interventions.

Synthesising the selected studies was useful for identifying factors that overweight and obese participants perceived as relevant to weight management. It is noted that participants' views are subjective; they may not be in line with the recommendations of best practice for managing weight. However, an intervention that incorporates factors that are perceived as important by potential users is likely to have better face validity, if it matches users' perceived needs (Crawford et al., 2002). These factors are defined in chapter 2. Table 15 presents descriptions of how the existing POWeR intervention satisfies these factors.

Table 15 The ways in which the POWeR intervention incorporates the factors overweight and obese people perceive as relevant to weight management

Perceived factors related to weight management	Descriptions of how the POWeR intervention incorporates the factors
Health concerns	Information about obesity-related health problems is presented. The detrimental effects of yo-yo dieting on health are explained. 'Health' is listed as a motivation for encouraging people to engage in weight management behaviours.
Expectations towards weight management	Examples for setting realistic and detailed goals and plans that can be incorporated into one's daily routine are provided. Emphasis is placed on setting goals that can be easily achieved within the individual's lifestyle.
Attributions for weight gain and the maintenance of excess weight	An imbalance between calories consumed and calories burned is presented as an explanation for the reasons for weight gain and the maintenance of excess weight. Users are informed about the role of behavioural changes to diet and physical activity levels to counteract weight gain and to lose weight. Users who attribute their excess weight to non-modifiable factors may be resistant to making behavioural changes to diet and physical activity levels.
Psychological facilitators	Information on behavioural tools, such as setting goals and plans related to dietary intake and physical activity, are provided. Users are prompted to identify reasons for why they want to lose weight, to increase motivation.
Psychological barriers	Users are given strategies to identify psychological states (e.g. sadness, boredom, cravings) when weight management behaviours may become jeopardised and tools for overcoming these problems.
Self-perception and body image	Improving how one feels about themselves is listed as a motivator for weight loss, which people can choose. Users can also challenge negative thoughts related to body image in session 8.
Stigmatizing experiences	There is a complex relationship between stigma, and people's perceptions of weight management. Some studies in the review suggested that stigma may motivate some people to lose weight. However, it is against the ethos of the

	<p>intervention to increase stigma and therefore self-perception issues are not addressed in the intervention. A session on identifying challenging thoughts exists. Although the session does not explicitly focus on stigmatising experiences, people can focus on stigmatising experiences if they choose to do so.</p>
Sociocultural factors	<p>Sociocultural factors can be both helpful and detrimental to one's weight management efforts. Users are encouraged to seek out social support (via the website, friends, and family) to get support for their weight management efforts. The intervention also prompts users to identify circumstances when social situations may jeopardise weight management goals and guides users to develop ways in which they may be able to overcome these pitfalls.</p>
Environmental facilitators	<p>Users are prompted to identify aspects of the environment that promote weight management behaviours, and are guided to set up their environment to be supportive of their weight management efforts.</p>
Environmental barriers	<p>Behavioural tools to identify environmental circumstances when weight management behaviours may become jeopardised are presented.</p>
Experiences with the programme	<p>The POWeR intervention is a structured programme that aims to instil autonomy and provide flexibility for its users, with the ultimate aim being to support users in becoming their own health coach. One of the key findings from the review was that it is important for interventions to strike an acceptable balance between providing structure for users, while allowing individuals to be in charge of their weight management.</p>
Positive outcomes of programme participation	<p>The POWeR intervention has been developed to take a positive approach to weight management. Participants may experience positive outcomes in different areas of their lives. For example, users may experience physical (losing weight), psychological (feeling better about self), or social (receiving encouragement from the website, family/friends) benefits, either due to losing weight or solely because of using the programme.</p>

Mapping the contents of POWeR onto the 12 factors confirmed that the POWeR intervention incorporated factors that by overweight and obese people deemed important for managing their weight. However, it is important to note that the majority of the participants in the study reviewed were female and therefore there may be other factors relevant to male participants that were not evident from this review. The systematic review did not lead to any modifications to the POWeR intervention as the findings from this review did not present information about the RN environment; the samples of the studies selected for the review comprised of civilians. For this reason, interviews were conducted with overweight and obese RN personnel, in order to gain insight into their weight management experiences.

6.2.3 Stage 4: Integrating findings from the interview study for developing POWeR-RN

The purpose of this empirical study was to determine whether there were differences between the weight management perceptions and experiences of overweight and obese RN personnel, compared to overweight and obese civilians, and if so, to identify ways in which the POWeR intervention would need to be modified to develop POWeR-RN. The main findings from the interviews suggest that the majority of participants perceived barriers at an environmental level, such as the availability of alcohol and high-calorie food. On the other hand, a smaller group of participants felt they lacked the knowledge and skills to manage their weight. The participants perceived several constraints within the Naval environment that made it difficult for them to manage their weight. For example, the eating and drinking culture in the RN was highlighted as a barrier to adopting healthier dietary behaviours. The interviews were also useful for ensuring that factors identified in the systematic review were also relevant to the participants interviewed in this study.

In parallel to thematically analysing the transcripts, an additional paper trail of potential intervention modifications was recorded that was later converted into a MoSCoW list (i.e. a detailed list of the modifications to the POWeR intervention based on the findings from the interviews; Appendix K).

The MoSCoW list is a way for prioritising the objectives of a project and is commonly used in software development; objectives are listed as ‘Must-haves’, ‘Should-haves’, ‘Could-haves’, or ‘Would-like’ (Clegg & Barker, 2004). In this case, the MoSCoW list was used to prioritise the modifications to the POWeR intervention. Creating the MoSCoW list was a useful exercise for determining which modifications could be made within a realistic timeframe, given the resource limitations of the project. Modifications were listed as ‘must-haves’ if they were deemed absolutely necessary for the POWeR-RN intervention to be used by overweight and obese RN personnel. ‘Must-have’ changes included modifying the content to increase the relevance of the intervention content for use by overweight and obese RN personnel. ‘Should-have’ modifications were items that would ideally be included in POWeR-RN once all the ‘must-haves’ had been finalised, and if time and resources permitted the inclusion of these modifications. For example, embedding links from the RN website for training regimes into POWeR-RN was categorised as a ‘should-have’ modification. ‘Could-have’ items were lower priority than ‘should-haves’ and would only be attempted to be undertaken if time-permitted once ‘must-have’ and ‘should-have’ modifications had been made. An example of this type of a modification was to add in a new session that would focus on managing weight on board ships. ‘Would-like’ items were suggestions for modifications that would not be feasible, or even possible to make, but may be considered in the future; for example, running the intervention on CDs so that it can be accessed on ships or at bases where the internet may not be available. At this stage, all must-have items were modified in the intervention in order to increase the relevance and the extent to which overweight and obese RN personnel could relate to the POWeR-RN intervention. There was insufficient time to make further modifications.

Extensive qualitative work was undertaken to ensure that the design and content of the POWeR intervention was relevant and credible to users. For developing the POWeR-RN intervention, qualitative work was undertaken to identify ways in which the POWeR intervention, originally designed for civilian users, could be modified to increase the relevance of the intervention for RN personnel. The addition of the RN logos to the homepage and changing the POWeR stories to more closely mirror the experiences of personnel in the RN

were the main ways in which an attempt was made to potentially increase the relevance of POWeR-RN for users in the RN.

6.2.4 Stage 5: Integrating findings from the thinkaloud study for developing POWeR-RN

The aim of this study was to investigate how overweight and obese RN personnel interacted with the POWeR-RN intervention and what their perceptions were of the intervention. Despite being optimistic and positive about the first session of the website during the interviews, few participants logged back onto the website to use the subsequent sessions in their own time. Follow-up telephone interviews revealed that one reason for the lack of use of the POWeR-RN intervention may have been due to an absence of any contact from a health professional. In order to increase participants' usage of the website, a supportive face-to-face meeting with physical training instructors was incorporated into the design of the feasibility study (Weinstein, 2006). The feasibility and effects of the supportive meetings were assessed in a feasibility study and reported in chapter 7.

In the original POWeR intervention, a session was included that aimed to increase users' levels of physical activity. The interviews revealed that there were differences in the exercise and training regimes of RN personnel compared to civilians. RN personnel's experiences of exercising and training in the RN suggested that the session titled 'Getting more active' would not meet the needs of users of the POWeR-RN intervention and was therefore removed. As a result, the POWeR-RN intervention has 11 sessions. The removal of the 'Getting more active' session meant that users would be able to choose which session they wanted to interact with after session 2, instead of session 3. Enabling users to choose which session they accessed early on in the intervention was also desirable given that only two participants in this study reached the point where they were able to choose the sessions of interest.

6.3 The application of theoretical frameworks to intervention modifications

Theoretical frameworks informed the modifications during stages 4 and 5, which have been presented above. The Self-Determination Theory (SDT) and the Social Cognitive Theory (SCT) were deemed most relevant for guiding the modifications. The SDT is a theory of motivation, and people's use of the intervention is closely related to their motivation for losing weight using a website. The SCT was selected as it is one of the well-established theoretical models that take into account the influence of the environment on human behaviour. In this section each theory is described individually, followed by a critical evaluation of its contribution to the modifications.

6.3.1 Self-Determination Theory

The Self-Determination Theory (SDT) provides a framework for studying motivation, which has implications for whether people engage in behaviours (Deci & Ryan, 1985). SDT posits that people have an inherent need for autonomy, competence, and relatedness, which when satisfied can enable people to function effectively and optimise their wellness. The POWeR and POWeR-RN interventions aim to maximise users' experience of autonomy, competence, and relatedness in the context of weight management.

Competence is related to people feeling capable of effectively managing their weight. POWeR provides users with a series of behaviour change techniques that have been found to be useful in the area of weight management. These behavioural techniques aim to increase people's confidence in their ability to manage their weight. Another way in which POWeR attempts to satisfy users' need for competence is by providing stories of POWeR users who relate their experiences of weight management, including difficulties and how they applied behaviour change techniques to overcome barriers. These stories potentially act as an example of how others have used the behaviour change techniques to successfully manage their weight, encouraging users to trial the behaviour change techniques for themselves.

Autonomy is related to people's decision to engage in a given behaviour but is different from independence (Deci & Ryan, 2000). The POWeR intervention takes a non-prescriptive approach to weight management, meaning that users are not given specific instructions what to do to manage their weight. Instead, the intervention presents users with behaviour change techniques that have been found to be effective for weight management. Users decide which sessions they will access in the intervention, including how often they will access the website. Together, these characteristics of the intervention aim to increase users' autonomy. Interestingly, some RN personnel who took part in an interview (chapter 4) challenged this notion by stating that they felt they would be better able to manage their weight if the RN enforced compulsory times for its personnel to exercise. Such views suggest that some personnel may not be willing to take responsibility for their lack of success with weight management and instead would rather engage in weight management behaviours that are externally motivated.

Relatedness refers to the need for feeling connected, understood, and cared for by significant others. Following from the findings from the think aloud interviews (chapter 5), it became apparent that users did not engage with the intervention after the first few sessions. One explanation for the lack of user engagement may be due to the absence of human involvement related to participants' experience of using POWeR-RN. For the subsequent study (chapter 7), physical training instructors were appointed to deliver a supportive session with participants using POWeR-RN.

The SDT also distinguishes types of motivation on a continuum of intrinsically and extrinsically driven behaviours. According to this perspective, people's motivation to engage in a particular behaviour is viewed differently depending on whether their goals are driven by intrinsic or extrinsic factors. The interviews (chapters 4 and 5) revealed that some overweight and obese RN personnel were motivated to manage their weight in order to keep their jobs in the RN or were interested in increasing their chances of getting a promotion in the RN. These motivations were added to the examples provided in the POWeR-RN intervention. These motivations can be seen as either intrinsically or extrinsically driven, depending on people's perspective on their circumstances. Some RN personnel may have strong feelings about their identity as RN personnel, in which case such a motivation may be categorised as an intrinsic

motivation. On the other hand, some personnel may be motivated to lose weight in order to keep their job in the RN for financial reasons, which may be considered more of an extrinsic motivation. In the context of weight management, intrinsically motivated goals have been associated with greater success.

6.3.2 Social Cognitive Theory

The Social Cognitive Theory (SCT) is a theory of social learning, which can help explain how new behaviours are learnt (Bandura, 1986). This theory aims to explain how and why people engage in behaviours, whilst also providing a framework for developing behaviour change interventions. According to the SCT, three key constructs, the environment, behaviours, and cognitions, interact to influence people's individual learning. Bandura proposes that one's confidence to engage in a particular behaviour is critical for shaping how an individual approaches a specific behaviour. This concept is called self-efficacy (Bandura, 1986). Modelling, or vicarious learning, is also a way of learning behaviours.

The POWeR and POWeR-RN intervention aims to change individual behaviour that will lead to successful weight management. Self-efficacy is related to people's beliefs about their confidence in their ability to engage in a particular behaviour. In line with this theory, the intervention attempts to enhance users' self-efficacy by guiding people to set realistic, achievable goals. According to SCT, as users meet their goals, their confidence in their ability to manage their weight should be enhanced, increasing their likelihood of managing their weight in the future.

The POWeR-RN intervention includes a variety of stories from real and hypothetical users, which aim to serve as models to users of the intervention. The stories are examples of how others have used a particular behaviour change tool or how they overcame a barrier to managing their weight. The interviews with RN personnel were useful for gaining insight into the lifestyle and behaviours of some overweight and obese personnel and findings were used as a guide to modifying the stories that would increase their likelihood of setting positive examples to potential users of POWeR-RN.

One of the main findings of the interview study (chapter 4) was that participants perceived the RN environment and culture influencing their weight management efforts. In fact, the RN food culture was perceived as a barrier for some personnel who were unsuccessful at managing their weight. The POWeR-RN intervention alone is unlikely to be as effective as possible without any changes to the RN environment. For example, a relatively small environmental change that was suggested by some participants was to change the layout of food in the dining halls so that personnel would first pass by the salad bar before approaching the hot food counter. Such an environmental change may be more effective than users attempting to implement their goals to restructure their environment that they may have set in the POWeR-RN intervention. In the absence of any environmental changes to the RN dining environment, the effectiveness of interventions that target individual behaviour are likely to be limited.

6.4 Conclusion

This chapter synthesises the findings from previous chapters and presents the stages involved in modifying the POWeR intervention to develop POWeR-RN. The survey study was useful for establishing that there are high rates of overweight and obese personnel in the RN, with some expressing an interest in using a web-based weight loss intervention. These findings were interpreted as a sign that there is scope to implement the POWeR-RN intervention among some overweight and obese personnel. The conceptual model derived in the systematic review and meta-synthesis was useful for establishing factors overweight and obese people perceived as relevant to their weight management experiences. Mapping the components of the POWeR intervention to these factors served as a confirmation that the intervention would appear credible and relevant to users, which has been found to be important for improving users' engagement with an intervention (Crawford et al., 2002). The first round of qualitative work gave useful insight into the lifestyle and weight management experiences of overweight and obese RN personnel, and informed preliminary modifications to the intervention. It was possible to increase the relevance of the content of the website for RN personnel by

incorporating examples and scenarios that an RN personnel may find themselves in. An essential part of the stages in modifying the intervention was piloting it with target users. Testing the intervention is crucial for determining how best to implement the intervention in the RN. The second round of interviews was useful for identifying the need for minimal face-to-face support in order to enhance users' likelihood for adhering to the intervention. The decision to exclude the session on "Getting more active" was also taken following the thinkaloud interviews.

There are some limitations of the POWeR-RN intervention. Due to limited Internet access on ships, it was not possible to implement the intervention for personnel assigned to vessels. The POWeR-RN intervention is only accessible from RN shore bases or from personnel's home. Obese personnel in the RN already receive support from medical staff and physical training instructors to lose weight, however, some personnel still lack the motivation to lose weight. The POWeR-RN intervention assumes that users are motivated to lose weight and therefore may not be useful for unmotivated obese personnel for achieving weight loss.

In conclusion, theoretical frameworks were helpful for providing guidance in developing, or in this case modifying, behaviour change interventions. User-input provides valuable contextualised insights that cannot be obtained deductively from theories. Integrating theory and user-input appears to be a useful way for developing and modifying behaviour change interventions, at least in the context of weight management. Chapter 7 presents the findings of a study in which the POWeR-RN intervention was piloted to test the feasibility of implementing the intervention with overweight and obese RN personnel over a three-month period.

7. Evaluating the feasibility of implementing a web-based weight loss intervention in the Royal Navy

7.1 Introduction

The previous chapters in this thesis laid the groundwork for undertaking a feasibility study to evaluate the possibility of trialling and implementing a web-based weight loss intervention for overweight and obese personnel in the Royal Navy (RN). The problem of overweight and obese personnel in the RN was presented in chapter 1. Chapter 3 suggested that obese personnel and female personnel may be especially interested in using a website to support their efforts to lose weight. In chapter 4, participants' perceptions of factors that may facilitate or hinder one's weight management efforts were highlighted. The views of overweight and obese personnel of the modified version of an existing web-based weight management intervention (i.e. POWeR-RN; chapter 6) were reported in chapter 5. Based on the findings of chapters 4 and 5, the website was adapted to support overweight and obese RN personnel in their attempts to manage their weight. One of the findings reported in chapter 5 was that participants perceived that having some amount of face-to-face contact would increase their likelihood of engaging with the website. Therefore, one face-to-face meeting with physical training instructors during participants' second week of participation in the study was added to the design of the feasibility study.

There are several reasons for conducting a feasibility study, with perhaps the most important being to assess whether it would be feasible to conduct a full-scale randomised control trial (van Teijlingen & Hundley, 2001). Other reasons include and are not limited to, developing and testing the adequacy of research instruments, informing the design of the research protocol, establishing whether the sampling strategy is effective, identifying logistic problems which may occur, estimating the variability of the outcomes for determining sample size, and giving a researcher training and experience in the various research processes (van Teijlingen & Hundley, 2001). It has been argued that the dominant research paradigm that focuses on evaluating the

efficacy of interventions may be limiting and perhaps not an appropriate standard to apply in all cases (Glasgow et al., 1999; Sorensen, Emmons, Hunt, & Johnston, 1998; Starfield, 1998). For example, studies that evaluate the efficacy of an intervention may not be useful for drawing conclusions about the implementation of the intervention, and vice versa.

This feasibility study is descriptive and does not aim to definitively establish the efficacy or effectiveness of the web-based weight loss intervention. Instead, this study aims to evaluate applicable stages and processes outlined by the RE-AIM framework that may be useful for estimating the likely feasibility of implementing the modified web-based weight loss intervention in the RN (Glasgow, McKay, Piette, & Reynolds, 2001; Glasgow et al., 1999).

7.1.1 The RE-AIM Framework

The RE-AIM framework comprises five dimensions that can be used to plan for and/or evaluate whether the implementation of an intervention is feasible in a real-world setting (Glasgow et al., 1999). This practical model aims to facilitate the translation of research into practice (Glasgow, 2013). The dimensions of the framework include, *reach*, *efficacy*, *adoption*, *implementation*, and *maintenance*. Reach refers to the proportion of the target population that participate in the intervention. Efficacy is related to the success rate of the intervention based on predefined outcomes for assessing success within the confines of the study. For this study, efficacy was concerned with whether people who use the intervention lose weight compared to people who do not use the intervention. Adoption refers to the proportion of invited staff in settings and worksites that adopts the intervention. Implementation is the extent to which the intervention is implemented as intended in the setting of interest. Maintenance refers to the extent to which the intervention is sustained over time. According to this framework, the impact of the intervention will be based on the combined effects of these dimensions.

Due to time and resource limitations, the purpose of this feasibility study was to evaluate the reach, efficacy, adoption and implementation dimensions.

In this 12 week feasibility study, no hypotheses were tested, and there was not sufficient time to evaluate the maintenance dimension of the RE-AIM framework for the POWeR-RN intervention. This study was not powered to test any hypotheses and the purpose of evaluating efficacy was to serve as a preliminary check to observe whether participants who used the intervention tended to lose weight compared to participants who did not use the intervention.

7.1.2 Aims

The purpose of this study was to evaluate the following dimensions of the RE-AIM framework: i) *reach*: the proportion of overweight and obese RN personnel who sign up to the study, ii) *efficacy*: the proportion of overweight and obese RN personnel who use the website and lose weight, iii) *adoption*: the proportion of RN bases that adopt the intervention, and iv) *implementation*: the proportion of instances where the intervention is implemented as intended in the various RN bases, i.e. participants using the website in their own time and attending a meeting with the physical training instructor. The study also aimed to assess physical training instructors' involvement in recruitment, data collection, and providing minimal face-to-face support to participants using the website.

7.2 Methods

7.2.1 Study setting

The shore-based establishments that were involved in this study were identified and notified by the Director for Naval Physical Development. These bases were located in the Portsmouth, Gosport, and Yeovil areas in the UK, namely HMS COLLINGWOOD, HMS NELSON, HMS SULTAN, HMS HERON, and HMS EXCELLENT. Two physical training instructors from each base were invited to attend an informational meeting prior to the start of the study where the researcher informed physical training instructors about the aims of the study, the website's structure and content, and physical training instructors' role in

the study. Each pair of physical training instructors was given a study folder containing information about the study, eligibility criteria, information sheets, consent forms, registration codes for enrolling to the website, and documents for recruitment and data collection (Appendix L). Physical training instructors played a crucial role in enabling the researcher to access the bases, and facilitated participant recruitment and data collection.

It was noted that at training bases where there were large numbers of RN personnel on courses, it was easier to access large groups of potential participants at one time, e.g. delivering the study brief to a collective audience during a class. However, at bases largely consisting of trained personnel, it was more difficult to access large groups and therefore recruitment relied more on setting up a trial stand in a public area, e.g. the galley entrance, and recruiting participants from those who approached with interest. For this reason, more participants were recruited from HMS COLLINGWOOD, HMS SULTAN, and HMS HERON compared to HMS NELSON and HMS EXCELLENT where mostly trained personnel were based. Physical training instructors were also able to offer more support with recruitment at sites where personnel were in training. The hierarchical structure among personnel at the RN bases may have had implications whilst recruiting participants to the study, particularly in terms of the extent to which some participants may have genuinely volunteered to take part in the studies.

7.2.2 Study design

The protocol for this study and ethical approval was received from the Ministry of Defence Research Ethics Committee (Reference Number: 330/Gen/12) and the research governance office at the University of Southampton. This study was designed to evaluate the feasibility of implementing a web-based weight loss intervention for overweight and obese RN personnel with minimal support from physical training instructors over 12 weeks.

The National Institute for Health Research's Evaluation, Trials and Studies Coordinating Centre differentiates between pilot and feasibility studies, which was taken into consideration during the development of this feasibility study (NIHR Evaluation Trials and Studies Coordinating Centre (NETSCC), 2013). A

pilot study is defined as “a version of the main study that is run in miniature to test whether the components of the main study can all work together” (NIHR Evaluation Trials and Studies Coordinating Centre (NETSCC), 2013). A feasibility study is conducted to determine whether it is feasible to conduct the study. The main differences between pilot and feasibility studies are that in a feasibility study, no hypotheses are tested and the primary outcome measure is not evaluated, whereas they may be conducted in a pilot study (NIHR Evaluation Trials and Studies Coordinating Centre (NETSCC), 2013).

A formal sample size calculation was not undertaken as this was irrelevant to the aims of the study. The target sample size was 60 overweight and obese male and female RN personnel who were fit for Naval service and were between the ages of 18-55. It was intended that 30 participants would be allocated to the intervention group and 30 to the waitlist-control group. A sample size of 60 was deemed appropriate as this would allow for a 40-50% dropout or loss to follow up, which is common in Internet-based research, resulting in an overall sample of at least 30 participants (Bennett & Glasgow, 2009).

One review of the literature identified strategies to improve recruitment to randomised controlled trials. Although this study was a feasibility study, some of the strategies were adopted in order to boost recruitment and the response rate to baseline and follow-up measures. These included using telephone and email reminders, and having an open design, where participants were informed about the study condition they were in (Treweek et al., 2010).

Participants could either be allocated to the intervention group or to a waitlist-control group. Participants were informed at the time of recruitment which group they were in. Participants from HMS SULTAN and HMS EXCELLENT were assigned to the waitlist-control group. Participants from HMS COLLINGWOOD, HMS NELSON and HMS HERON comprised the intervention group. Participants' allocation to the two study groups was done by base to prevent contamination due to sharing information from the website between colleagues. Bases that were similar in their demographic characteristics were allocated to different conditions; these were HMS SULTAN and HMS COLLINGWOOD, and HMS NELSON and HMS EXCELLENT.

All participants were given written and verbal information about the study. Written informed consent was obtained from all participants. All participants completed a basic demographic form at the time of recruitment. Participants' height, weight and waist circumference measurements were obtained by physical training instructors and the researcher using a standard tape measure, and various stadiometers and scales. Standard operating procedures were followed for measuring weight, height and waist circumference. Participants' weight measurements were taken with light clothing and without shoes, height measurements were taken without shoes, and waist circumference measurements were taken around the narrowest part above participants' hip bone and below their lowest rib.

All participants were allocated a unique study identification number that enabled them to register to the website to access questionnaires and the POWeR-RN website. Participants in the intervention group were given a link that gave them access to the intervention upon completion of the baseline questionnaires. Participants in the waitlist-control group were given a different link that only gave them access to the baseline questionnaires. Participants in the waitlist-control group were informed that they would have access to the website following completion of their follow-up measures (anthropometric and questionnaire measures) in 12 weeks' time.

The literature suggests that support from coaches, nurses, and other health professionals could increase participants' adherence to a web-based weight loss intervention (Bennett et al., 2010; Rothert et al., 2006; Saperstein et al., 2007; Tate et al., 2001). RN personnel had also reported previously that they would be more likely to adhere to the website if more support was provided (chapter 5). Participants in the intervention group were encouraged to arrange a time and date to meet the physical training instructor two weeks from when they started using the intervention. Similarly, physical training instructors were also encouraged to contact participants to make arrangements for this meeting. The researcher had access to automatically collected website usage data, which meant that the researcher was able to update physical training instructors about participants' engagement with the website. Physical training instructors had been given a demonstration during the informational meeting with the researcher about the format of these meetings. It was intended that these approximately 5-minute meetings would

be face-to-face, where the physical training instructor would offer positive feedback and encouragement relating to participants' efforts to lose weight and engage with the website.

Follow-up weight measurements at 12 weeks were carried out by physical training instructors. Arrangements for follow-up weight measurements were made by the researcher, who contacted participants via weekly email reminders and by calling participants and physical training instructors over the phone. Non-respondents to the online follow-up questionnaires were sent hardcopies of the questionnaire with a freepost envelope they could use to return their responses. However, no participants returned these postal questionnaires. Participants were also contacted by telephone where possible to obtain their responses via telephone interview.

7.2.3 Recruitment

Recruitment commenced in September 2012 and continued until April 2013. A rolling recruitment strategy was employed. From September 2012 to January 2013, physical training instructors at the five RN bases were responsible for recruiting overweight and obese RN personnel to the study, informing them about how to access online questionnaires and the website, and collecting their baseline height, weight and waist circumference measurements. The slow flow of participants instigated a change in the original recruitment design from January 2013.

The researcher and a contact from the Institute of Naval Medicine (INM) arranged recruitment days via physical training instructors at each of the bases and set up stalls at the bases to recruit eligible personnel to the study. The stalls were set up during organised events, at lunch times near dining areas and in sports centres, where the stall would be visible to large numbers of RN personnel.

7.2.4 Participants

The eligibility criteria included having access to a computer with Internet, and being overweight or obese (determined by body mass index [BMI] and waist circumference). BMI was calculated as weight in kilograms divided by the square of participants' height in metres. For RN personnel who may have a higher ratio of muscle mass to body fat, a BMI greater than 25 may not indicate an increased health risk. For this reason, participants' waist circumference was also measured to assess their level of risk for developing obesity-related health conditions, in accordance with the National Institute for Clinical Excellence guidelines (National Institute for Health and Clinical Excellence (NICE), 2006). For participants with a BMI greater than 25, a waist circumference measurement greater than 94cm in men and a measurement greater than 89cm in women indicated a heightened risk of developing obesity-related conditions.

7.2.5 Measures

Demographic information was collected by self-report either online or over the telephone. BMI was calculated from participants' height and weight data. Measurements of height, weight, and waist circumference, and participants' responses to three questionnaires were completed at baseline and 12 weeks' later. Website usage was electronically tracked to evaluate participants' engagement with the intervention. The questionnaires included in this study were developed for a randomised controlled trial (RCT) that was in process at the time of the write up of this thesis. This trial aimed to test the effectiveness of the POWeR intervention in a primary care sample (Current Controlled Trials, 2012). The questionnaires listed below were included in this study for the purpose of comparison between the RN sample and the sample from the general population. However, at the time of the write up of this thesis, data analyses of the RCT had not been finalised and there was not sufficient data from the RN sample, therefore it was not possible to compare questionnaire results. Below are justifications for and descriptions of the online questionnaires participants were instructed to complete, which were also sent as hard copies later on to nonresponders (Appendix M).

Theory of Planned Behaviour constructs

This scale was developed to gain access to participants' behavioural, normative, and control beliefs about using the intervention, in accordance with Ajzen's instructions for constructing a Theory of Planned Behaviour (TPB) questionnaire (Fishbein & Ajzen, 2010). Research suggests that the TPB constructs may be reliable predictors of health behaviours, including dietary behaviours and physical activity (McEachan et al., 2011).

The TPB questionnaire consisted of 20 items that could be rated on a 7-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = undecided, 5 = somewhat agree, 6 = agree, 7 = strongly agree). Participants were instructed to rate four statements that aimed to assess their attitudes (e.g. "Following this weight reduction eating plan will benefit me" and "following this weight reduction plan will be useless"), two statements about their subjective norms (e.g. "My family and friends think that I should follow this weight reduction eating plan"), two statements relating to their perceived behavioural control (e.g. "I will find it easy to follow this weight reduction eating plan"), and two items on their intention to use the intervention (e.g. "I intend to follow this weight reduction eating plan"). Participants were also instructed to rate similar statements about their attitudes (four items), subjective norms (two items), perceived behavioural control (two items) and intentions (two items) to increase their physical activity levels.

Treatment Self-Regulation Questionnaire for using the POWeR-RN intervention

An adapted version of the Treatment Self-Regulation Questionnaire introduced by Ryan and Connell (1989) was used to assess participants' autonomous, introjected and extrinsic motivations prior to using the intervention at baseline. It was relevant to assess autonomous motivation as it has been associated with increased adherence to weight loss programs, losing weight, and maintaining weight loss at follow-up (Maes & Karoly, 2005; Williams, Grow, Freedman, Ryan, & Deci, 1996). Amotivation refers to a lack of motivation to engage in a particular behaviour. It was assumed that potential participants

who were not motivated to engage with the intervention or to lose weight would not sign up for the study, and therefore items for measuring this construct were not included in the questionnaire.

Concepts measured by this questionnaire come from the Self-Determination Theory, which has previously been presented in chapter 6 (Deci & Ryan, 1985). This questionnaire has been validated in a similar sample (Levesque et al., 2007). The scale consisted of 12 items that could be rated on a 7-point Likert scale (1 = not at all true, 2 = untrue, 3 = somewhat untrue, 4 = neither true nor untrue, 5 = somewhat true, 6 = true, 7 = very true). Examples of autonomous motivations (6 items) for using the intervention included, “because I personally believe it is the best thing for my health”. Two items were used to assess introjection, “because I would feel guilty or ashamed of myself if I did not” and “because I would feel bad about myself if I did not”. Examples of extrinsic motivations for using the intervention included four items, such as, “because I feel pressure from others to do so” and “because I want others to approve of me”.

Godin Leisure-Time Exercise Questionnaire

Physical activity was measured using the Godin Leisure-Time Exercise Questionnaire that has been found to have good reliability and validity in similar samples (Godin & Shephard, 1997). The questionnaire consists of four brief items that ask the participant about their usual leisure-time exercise habits. Participants are asked to report the number of times per week they engage in strenuous, moderate and mild exercise for more than 15 minutes. The final question asks participants to choose whether they “often,” “sometimes,” or “never/rarely” engage in any regular activity long enough that they work up a sweat. A total leisure activity score is calculated based on participants’ responses to how often they engage in strenuous, moderate and mild exercises in a week (Total leisure activity score = (9 x strenuous) + (5 x moderate) + (3 x mild)).

7.2.6 Statistical analyses

Data were analysed using SPSS software. Independence of the Theory of Planned Behaviour (TPB) constructs and Treatment Self-Regulation dimensions were checked by referring to corrected inter-correlations. The reliability of each scale was assessed by calculating Cronbach's alphas, which are reported in the results section. Dimensions with a reliability score below .70 suggest that the items within these dimensions had poor internal consistency, where the items correlated poorly with other items, indicating that the items may be measuring different constructs (Rattray & Jones, 2007). Scores for negatively stated items in the questionnaires were reversed prior to being analysed. An exploratory effect size, using Cohen's *d*, was calculated for the mean changes in weight for completers by subtracting participants' follow-up weight from their baseline weight in the two study groups ($n = 26$). Effect sizes were interpreted using the following criteria: $< .30$ small effect size; $.30$ to $.80$ medium effect size; $> .80$ large effect size (Cohen, Cohen, West, & Aiken, 1983).

7.3 Results

This section presents an evaluation of the *reach*, *efficacy*, *adoption*, and *implementation* dimensions of the RE-AIM framework for the POWeR-RN intervention with minimal support from physical training instructors. The study aimed to assess the feasibility of introducing the intervention in the RN and physical training instructors' involvement in recruitment, data collection, and providing minimal face-to-face support to participants using the website.

7.3.1 Reach

Reach was related to the proportion of overweight and obese RN personnel who signed up to the study. Although exact figures of all eligible personnel from RN bases participating in the study were not collected, the most recent prevalence rates of overweight and obese personnel at an increased risk for developing obesity related health problems in the RN has been established as 30% ($n = 178$), based on objective measures of BMI and waist circumference

from 600 RN personnel (Shaw et al., 2013). Given the prevalence of overweight and obese RN personnel, it was expected that a sample size of 60 would be achieved. At the end of January 2013 only 15 participants from three bases (HMS COLLINGWOOD = 4; HMS NELSON = 4; HMS SULTAN = 7) had been recruited into the study. The second recruitment strategy involving the researcher and a colleague from the INM resulted in the recruitment of a further 28 participants. Table 16 shows the number of stalls that were set up at each base and the distribution of the 28 participants recruited from each base.

Table 16 Number of stalls set up and participants recruited at the RN bases

RN Base	No of stalls	Participants recruited
HMS COLLINGWOOD	5	14
HMS EXCELLENT	2	0
HMS HERON	1	9
HMS NELSON	4	0
HMS SULTAN	5	5

In total, 58 participants were screened to take part in the study and 43 RN personnel were recruited to the study. The fact that the target sample size of 60 was missed after eight months of recruitment across 5 RN bases (approximately 3000 RN personnel in total) suggests that interest among overweight and obese RN personnel to take part in this intervention may have been low or that the study may not have been given sufficient exposure at the bases. Based on previous reports on the proportion of overweight and obese personnel in the RN, it would be expected that almost a third of RN personnel would be eligible to take part in the study (approximately 1000 overweight and obese personnel) (Shaw et al., 2013). Overweight and obese RN personnel who showed an interest ($N = 58$ out of 1000) in the intervention could be estimated as approximately 6% across the five bases. It is worth noting that 13 of these participants did not meet the eligibility criteria based on their BMI and waist circumference data, which did not indicate an increased risk for developing obesity-related health problems.

7.3.2 Efficacy

Based on the follow-up weight data from 16 participants in the intervention group, participants lost on average 1.94kg ($SD = 2.12$), ranging from losing 6.00kg to not losing any weight at all over a 12 week period. As participants, on average, used 1.5 sessions out of 11 sessions, it appears that participants lost weight in accordance with the website's and national guidelines, which recommend aiming to lose 0.5kg per week (National Institute for Health and Clinical Excellence (NICE), 2006). Participants in the intervention group appeared to maintain the weight they lost. Participants in the waitlist-control group who had their follow-up weight measurements taken ($n = 10$), on average lost .76kg ($SD = 3.80$), ranging from losing 6.00kg to gaining 5kg. In terms of effect size, it has been suggested that Cohen's d is more suitable for determining the effect of an intervention in contrast to r , which is more appropriate for evaluating correlations between variables (McGrath & Meyer, 2006). A small to moderate effect size was found based on participants' mean change in weight (calculated by subtracting follow-up weight from baseline weight) between the two study conditions, Cohen's $d = 0.38$. This suggests that participants who did use the intervention lost more weight than participants who did not use the intervention. Therefore, the intervention might prove efficacious in a definitive trial.

7.3.3 Adoption

Adoption referred to the proportion of RN bases that adopt the intervention. The RN bases that took part in this study and the physical training instructors who were to collaborate with the researcher were selected by the Director of Naval Physical Development. Initially, three out of five physical training instructors from three bases were able to recruit participants to the study. Following the researcher's involvement in recruitment, participants were recruited from four of the bases. HMS EXCELLENT was the only base where no participants were recruited. This is where the Navy Command Headquarters are

based; but it is not known why there was no take-up of the website at this site. The intervention was adopted by four out of five RN bases.

7.3.4 Implementation

Implementation relates to the proportion of instances where the intervention was implemented as intended in the four participating RN bases, i.e. participants used the website in their own time and attended a meeting with the physical training instructor. The 5-minute face-to-face meetings between participants and physical training instructors were not arranged for any participant. None of the participants or physical training instructors was able to arrange this supportive meeting, suggesting that this meeting in practice might be unfeasible or that physical training instructors were not onboard with the aims of the study. It is unclear what physical training instructors thought about the website and how they advocated the study in general. In meetings with the researcher, physical training instructors appeared enthusiastic about the study but whether this enthusiasm came across to participants is not clear.

It has been recommended that characteristics of participants of behaviour change interventions who respond and do not respond to assessments should be compared, as well as comparisons of characteristics of those who complete the study and those who do not (Michie, Fixsen, Grimshaw, & Eccles, 2009). There were no major differences between participants who responded to the questionnaires and those who did not, based on age, gender, rank, or marital status on an exploratory basis. There was an association between the group participants were allocated to and whether they completed the baseline online questionnaires, where participants in the website group (19 responders; 2 nonresponders) appeared more likely to complete the online measures compared to those in the waitlist-control group (3 responders; 19 nonresponders).

Twenty-two participants ($n = 18$ intervention group) had completed the online baseline questionnaires, resulting in a 51% response rate. Of these participants, only five participants from the intervention group completed the follow-up questionnaires online, and none from the waitlist-control group. For baseline and follow-up measures only one person's responses were obtained

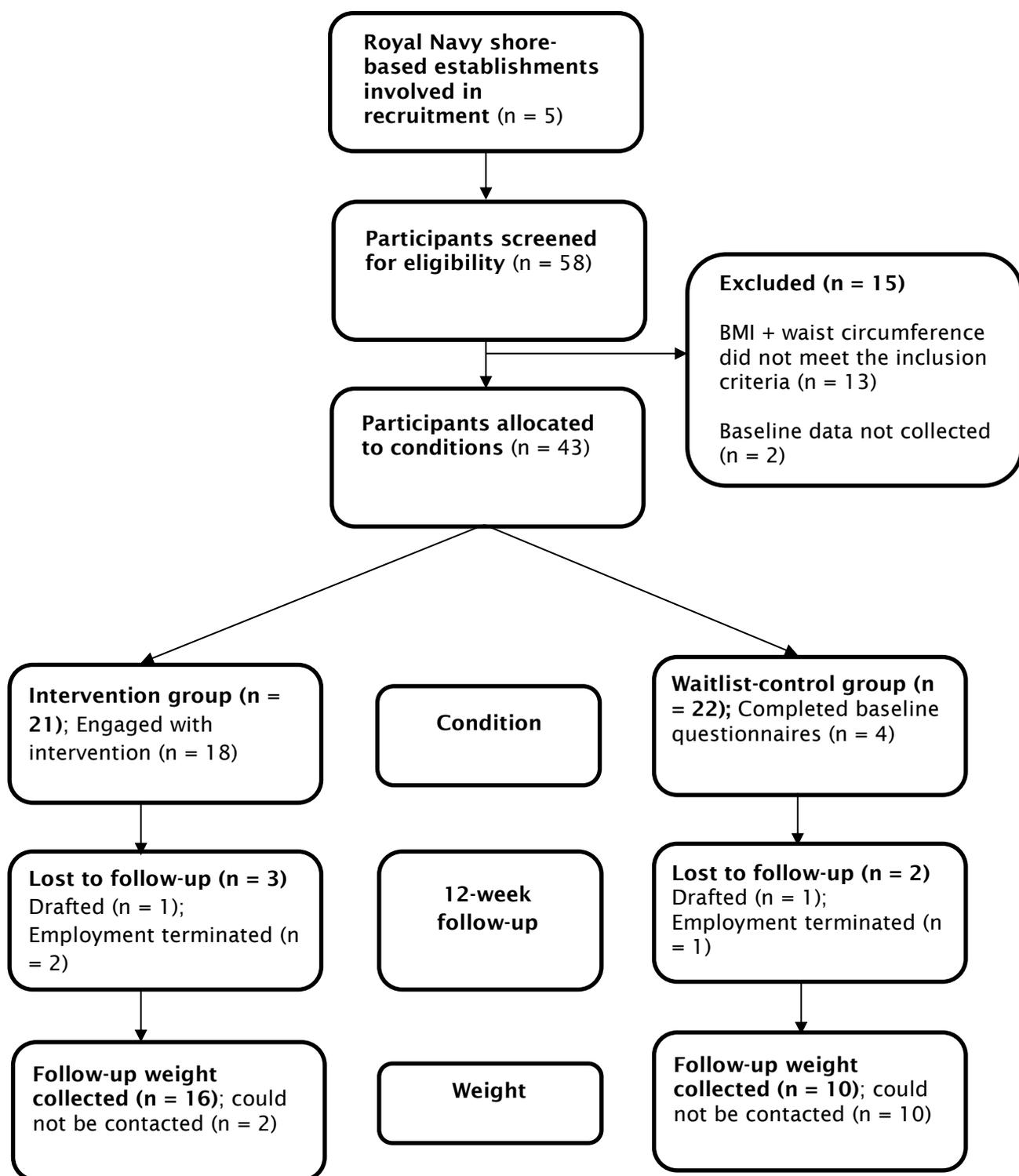
over the phone. Almost half of the participants who were contacted by phone, in relation to their follow-up measures, asked to be called back at a later time and when participants were called, they did not answer their phone. Due to a low response rate to follow-up questionnaires ($n = 5$, 12%) from participants in both groups, follow-up questionnaires were excluded from any exploratory analyses as it was not possible to conduct any pre-post analyses for the questionnaires. No participants in the waitlist-control group completed follow-up measures, nor did they contact the researcher for accessing the intervention. Most participants in the intervention group completed baseline measures and accessed at least one session of the intervention. Follow-up weight measurements at 12 weeks were carried out for 26 participants by physical training instructors at the bases, giving a follow-up response rate of 60%. Attrition was 40% from baseline to follow-up at 12 weeks for the primary outcome measure (weight in kg).

There were 21 participants in the intervention group and 22 in the waitlist-control group. All participants were White. Most participants were male ($n = 39$). The average age for participants was 33 ($SD = 9.93$) that ranged from 22 to 52. The majority of participants were ratings ($n = 40$), which meant they were of a lower rank in the RN hierarchical system. Only three officers signed up to the study. Eighteen participants were single, eighteen were married, and seven reported having a partner. Participants' baseline BMIs ranged from 25.30 to 39.70, with an average of 31.51 ($SD = 3.33$). Less than half of participants had been advised to lose weight by medical staff ($n = 15$). Table 17 presents participants' baseline demographic characteristics broken down by the study condition they were in. The average age of participants in the website group was 34 ($SD = 10.56$) and 32 ($SD = 9.44$) for participants in the waitlist-control group. The average body weight (in kg) for participants in the website group was 95.69 ($SD = 12.19$), ranging from 65 – 123. The average body weight for participants in the waitlist-control group was 95.92 ($SD = 10.98$), ranging from 79 – 119. Figure 3 shows participants' flow through the study.

Table 17 Baseline demographic characteristics

Variable	Website Group (<i>n</i> = 21)	Waitlist-control Group (<i>n</i> = 22)
<i>Gender</i> (male)	19 (90%)	20 (91%)
<i>Qualifications</i>		
GCSE	9 (43%)	15 (68%)
A-levels	4 (19%)	2 (9%)
Diploma	5 (24%)	3 (14%)
Degree	3 (14%)	2 (9%)
<i>Marital Status</i>		
Single	6 (29%)	12 (54%)
Married	11 (52%)	7 (32%)
Partner	4 (19%)	3 (14%)
<i>Rank</i>		
Rating	20 (95%)	20 (91%)
Officer	1 (5%)	2 (9%)

Figure 3 Participant flow through the study



Eighteen participants in the website group accessed one or more of the 11 sessions available in the POWeR-RN intervention. The average number of sessions participants accessed was 1.5 ($SD = 1.29$), where 14 participants accessed one session, one participant accessed two, two participants accessed three, and another accessed six sessions. Eighteen participants in the website group and four participants in the waitlist-control group completed the baseline questionnaires. A systematic review on the determinants of participation in worksite health promotion programmes suggested considering a response rate below 34% to be low (Robroek, van Lenthe, Van Empelen, & Burdorf, 2009). As there was a very low response rate ($n = 4$; 18%) to the baseline questionnaires from waitlist-control group participants, it was not possible to run any exploratory analyses to compare participants' responses between the two conditions. The questionnaire responses from the intervention group participants are reported in the next section.

7.3.5 Exploratory questionnaire analyses

Nineteen participants from the intervention group and three from the wait-list control group responded to baseline questionnaires. Table 18 presents descriptive statistics for baseline TPB constructs and the dimensions of motivation from participants in the website group. As the number of items corresponding to specific constructs in the TPB questionnaire and the dimensions of motivation varied, participants' scores for a particular construct were recoded to standardise all construct scores to fall between 1 and 7. As there were only three participants who responded to baseline questionnaires from the waitlist-control group, these data were excluded and it was not possible to conduct any statistical comparisons between participants' responses based on their group allocation.

The reliability scores for each construct are presented. For items in the TPB questionnaire participants were instructed to rate their agreement with statements that aimed to assess their attitudes (e.g. "Following this weight reduction eating plan will benefit me") (4 items, $\alpha = .62$), subjective norms (e.g. "My family and friends think that I should follow this weight reduction eating plan") (2 items, $\alpha = .84$), perceived behavioural control (PBC) (e.g. "I will

find it easy to follow this weight reduction eating plan”) (2 items, $\alpha = .70$), and intention to use the intervention (e.g. “I intend to follow this weight reduction eating plan”) (2 items, $\alpha = .97$). Participants were also instructed to rate their agreement with similar statements about their attitudes (4 items, $\alpha = .71$), subjective norms (2 items, $\alpha = .78$), PBC (2 items, $\alpha = .24$) and intentions (2 items, $\alpha = .68$) to increase their physical activity levels. As a low reliability was identified for PBC to increase physical activity levels, the two items (PBC - 1: “It will be possible for me to increase my level of physical activity” and PBC - 2 “I will find it easy to increase my level of physical activity”) were analysed separately as they may be measuring different constructs. One explanation for the low reliability of the PBC construct for increasing levels of physical activity may be due to participants already engaging in a particular amount of physical activity. Indeed, participants’ average total leisure activity score was 52.73 ($SD = 36.79$). Other studies that have used the Godin scale to assess physical activity have considered scores above 26 to indicate that the respondent engages in high levels of physical activity (Martinson, O’Connor, & Pronk, 2001). This suggests that the participants who completed the Godin scale could be considered as being physically active. Although participants may have rated that it would be possible to increase their levels of physical activity, they may have disagreed that it would be easy if they were already engaging in a substantial amount.

The TSRQ included items to measure participants’ autonomous motivations for using the intervention. Six items were used to assess autonomy, e.g. “because I personally believe it is the best thing for my health” ($\alpha = .85$). Two items were used to assess introjection, “because I would feel guilty or ashamed of myself if I did not” and “because I would feel bad about myself if I did not” ($\alpha = .93$). Four items were used to assess extrinsic motivations for using the intervention, e.g. “because I feel pressure from others to do so” and “because I want others to approve of me” ($\alpha = .82$). A relative autonomy index was calculated for each participant by summing together participants’ weighted scores for the autonomy, introjection, and external motivation subscales, where autonomy scores were multiplied by 2, introjection scores were multiplied by -1, and external motivation scores were multiplied by -2. The mean relative autonomy index was 17.47 ($SD = 11.76$), with scores ranging from -10 to 40. A positive index indicates more

autonomous motivation to lose weight, while a negative index suggests more external motivations to lose weight. This suggests that according to the average relative autonomy index, participants reported having more autonomous motivation to lose weight compared to external motivation.

Table 18 Descriptive statistics for baseline variables

Baseline Variables	Mean (SD)
<i>Eating plan</i>	
1. Attitudes	5.49 (0.73)
2. Subjective norms	3.55 (1.41)
3. Intentions	5.66 (1.11)
4. PBC	4.45 (1.08)
<i>Physical activity (PA)</i>	
5. Attitudes	6.09 (0.78)
6. Subjective norms	3.58 (1.58)
7. Intentions	5.65 (1.08)
8. Possible to increase PA	5.58 (1.26)
9. Easy to increase PA	4.68 (1.49)
<i>Motivation</i>	
10. Autonomy	3.64 (0.71)
11. Introjection	3.31 (1.95)
12. External motivation	2.44 (1.33)
13. Relative autonomy index	17.47 (11.76)
<i>Leisure-time exercise score</i>	
14. Total activity score	51.11 (36.72)

Values are for 19 participants who completed baseline questionnaires in the website group.

On average, participants appeared to have stronger positive attitudes towards increasing their levels of physical activity compared to following the eating plan in the intervention. On average, participants reported similar intentions for following the eating plan and increasing their levels of physical activity. Overall, participants tended to report low autonomous, introjected and external motivation to using the intervention, where scores greater than 4 would have indicated being motivated. The average relative autonomy index was 17.47, which is similar to the mean relative autonomy index of participants ($\bar{x} = 19.66 (12.88)$) in the preparation stage of the stages of change model for increasing exercise levels (Mullan & Markland, 1997).

Bivariate correlations between TPB constructs, dimensions on motivation and total leisure-time activity scores were carried out and are presented in Table 19. The correlations are considered in terms of their effect size rather than their significance level due to the small sample size and the exploratory nature of the variables. As a general guideline, Cohen's (1992) recommendations of small ($r = .10$), medium ($r = .30$) and large ($r = .50$) effect sizes were used. Medium to large effect sizes are considered in the following section, as they may be related to intentions to following an eating plan in the intervention and increasing levels of physical activity.

Chapter 7

Table 19 Bivariate correlation coefficients (r) for baseline variables from website group participants' responses (n = 19)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Eating plan (EP) attitudes	1.00													
2. EP subjective norms	-.32	1.00												
3. EP intentions	.29	.06	1.00											
4. EP PBC	.24	.00	.19	1.00										
5. Physical activity (PA) attitudes	.58	-.04	.41	.28	1.00									
6. PA subjective norms	-.11	.72	.42	.25	-.08	1.00								
7. PA intentions	.29	.06	1.00	.19	.41	.15	1.00							
8. Possible to increase PA	.10	.28	.68	-.24	.34	-.01	.68	1.00						
9. Easy to increase PA	.15	.13	.21	.44	.36	-.04	.21	.10	1.00					
10. Autonomy	.03	.46	.76	.44	.15	.53	.76	.41	.33	1.00				
11. Introjection	.00	.31	.46	.13	-.13	.42	.46	.32	.20	.63	1.00			
12. External motivation	-.31	.42	.09	.06	-.43	.37	.09	.20	-.07	.36	.54	1.00		
13. Relative autonomy index	.30	-.14	.32	.22	.54	-.09	.32	.01	.24	.20	-.36	-.82	1.00	
14. Total leisure-time activity score	.26	-.03	-.03	-.07	-.26	-.01	-.03	.15	.01	-.06	.22	.08	-.19	1.00

Attitudes related to following the eating plan and increasing physical activity levels were associated, suggesting that participants who reported that following the eating plan would be beneficial and leave them feeling good were also likely to report having positive attitudes for increasing their levels of physical activity. Participants who had negative attitudes towards following the eating plan were also likely to report having negative attitudes to increasing their levels of physical activity.

There was a large correlation between participants' reports of their subjective norms for following the eating plan and increasing their levels of physical activity. Participants, who reported that their friends, families, nurses, and doctors think they should follow the eating plan in the intervention, also reported that they would also think that the participant should increase their physical activity levels. Participants who disagreed that others think they should follow the eating plan were also likely to disagree that others think they should increase their levels of physical activity.

Intentions to follow the eating plan correlated with participants' reported intentions to increase their levels of physical activity. It is possible that this finding may be due to a measurement effect, where participants' responses may have been biased because of the measures. This suggests that participants who reported intending to follow the eating plan were also likely to report intending to increase their levels of physical activity. Participants who reported they were not intending to follow the eating plan were also likely to report no intentions to increase their physical activity levels.

Intentions to increase physical activity levels correlated with reports that it would be possible to increase physical activity levels. Those participants who reported intending to increase physical activity levels were also likely to report that it would be possible to increase physical activity levels. Intentions to increase physical activity levels significantly correlated with autonomous (motivation that comes from within for the inherent enjoyment rather than externally) and introjected motivation (motivation that comes from within to avoid guilt or feeling bad), suggesting that participants who intended on increasing their physical activity levels were more likely to report autonomous and introjected motivation.

An association was observed between participants' reports of their subjective norms for following the eating plan and their ratings of items measuring autonomous motivation. The items measuring autonomous motivation were phrased as reasons why participants wanted to use the online weight loss programme, "because I want to take responsibility for my own health", "because I personally believe it is the best thing for my health", "because I have carefully thought about it and believe it is very important for many aspects of my life", "because it's an important choice I really want to make", "because it is consistent with my life goals", and "because it is very important for being as healthy as possible". Participants who agreed with these statements were likely to report that others would think they should follow the eating plan in the intervention.

A correlation was observed between participants' autonomous motivation and introjected motivation. Items measuring introjected motivation included "I would feel guilty if I did not use the POWeR online weight loss programme" and "I would feel bad about myself if I did not use the POWeR online weight loss programme". There was also a correlation observed between participants' introjected and external motivation scores, suggesting that participants' whose motivation to use the intervention could be classified as introjected, were also likely to report being externally motivated. External motivation negatively correlated with participants' relative autonomy index, which is what would be expected. This suggests that participants who had a higher relative autonomy index were less likely to be externally motivated to use the programme.

Attitudes to increasing physical activity levels significantly correlated with the relative autonomy index, suggesting that participants who were more likely to report positive attitudes about increasing levels of physical activity were more likely to report being autonomously motivated to use the weight loss intervention.

The reported findings are correlational and therefore no predictions can be made about the direction of the relationships. Although the statements provided suggest a particular direction, it should be noted that none of the variables predict scores for another variable.

7.4 Discussion

A discussion of the findings from this feasibility study will be presented in terms of the *reach*, *efficacy*, *adoption*, and *implementation* dimensions of the RE-AIM framework on their implications for implementing the web-based weight loss intervention for overweight and obese RN personnel. The findings will also be related to the wider literature. The strengths and limitations of the study will be presented, followed by concluding remarks and suggestions for the next steps that could be taken in the RN.

7.4.1 The RE-AIM Framework

7.4.1.1 Reach

Recruitment lasted eight months using two strategies. The first strategy involved physical training instructors taking the lead to recruit participants from their respective bases. However, this resulted in low recruitment rates. The second recruitment strategy involved the researcher and a colleague from the Institute of Naval Medicine (INM) visiting the bases to recruit participants. The second approach resulted in the recruitment of more participants, but from a practical perspective, it is unlikely that this strategy could be maintained in the longer term. Personnel who took part in this 12 week feasibility study were informed at the start of the study about whether they had immediate or delayed-access to the website and that this depended on which base they were working at. Overall, a reach of 6% was calculated based on the number of personnel who showed an interest in the study ($n = 58$) and the estimated number of eligible personnel across the five bases ($N = \sim 1000$).

Other studies that have evaluated the reach of web-based weight loss interventions in workplaces and primary care have reported recruitment rates as high as 26% in primary care (Bennett et al., 2010) samples, and 10% in workplaces (Morgan, Collins, et al., 2011). In a community-based sample, only 2.4% of people who had no major health problems showed an interest in using an Internet weight-loss intervention and recruitment was higher for people who had coronary artery disease (10%) and those with diabetes (7%) (Glasgow et al., 2007). The reach of the POWeR-RN intervention appeared to be in an

acceptable range compared to other study settings dealing with healthy working populations.

7.4.1.2 Efficacy

The findings suggest that website usage was generally low and a decrease in usage was observed over time, which is comparable to other studies that have evaluated participants' engagement with web-based interventions for weight loss (Bennett & Glasgow, 2009). Participants who engaged with the intervention, even in the absence of any support from physical training instructors, tended to lose weight more than participants who did not use the intervention. Although a small amount of weight loss was observed over 12 weeks, the effect size suggests that the intervention had a moderate effect on weight loss. Additionally, the Diabetes Prevention Program found that every 1 kg of body mass lost was associated with a 13% decrease in the risk of incident diabetes (Delahanty & Pettee, 2004). This suggests that even small changes in weight may lead to physical benefits. The preliminary data indicates that the intervention may be efficacious for overweight and obese RN personnel who engage with the intervention, though caution is needed when interpreting the results as the study was not powered to statistically test the significance of differences in weight change.

7.4.1.3 Adoption

There were five RN bases that were selected by the Director of Naval Physical Development (DNPD) to take part in this study. Four out of five bases were actively involved in the study. It was not possible to recruit any participants from HMS EXCELLENT despite advertising the study via various approaches, including, posters, emails, recruitment desks, and in meetings. In addition to these approaches for recruitment, three of the four bases had organised events that are comparable to Fresher's Fairs commonly organised at universities, which the researcher and colleague from INM attended. These events gave exposure of the study to large numbers of RN personnel. In the absence of support from DNPD in selecting the bases to take part in the study, it is unlikely that any recruitment would be possible.

7.4.1.4 Implementation

There is evidence suggesting that support from health professionals could increase participants' adherence to web-based weight loss interventions (Bennett et al., 2010; Rothert et al., 2006; Saperstein et al., 2007; Tate et al., 2001). In fact, the most effective web-based weight loss interventions have included some support from health professionals or coaches in varying frequencies, either in-person or over the telephone (Khaylis, Yiaslas, Bergstrom, & Gore-Felton, 2010). It was not possible to implement the POWeR-RN intervention as it was intended at any of the bases, i.e. with minimal support from physical training instructors. It did not seem that many participants took the opportunity to speak to physical training instructors about their use of the website, but it is not known whether this was due to heavy work schedules, lack of inclination, or another reason. This is discussed in more detail in section 7.4.3. It is possible that had participants received more face-to-face support this might have increased engagement with the intervention, and this is worth considering for future trials of the intervention.

Participants in the intervention group were more likely to complete online baseline measures, compared to waitlist-control group participants. This is in contrast to findings in the literature that report lower responses to questionnaires from participants in the intervention group compared to the control group (Carr et al., 2008; Hunter et al., 2008; Morgan, Lubans, Collins, Warren, & Callister, 2009; Womble et al., 2004). Response rates in the intervention group may have been higher as the questionnaires were included at the start of the registration to the weight loss website, meaning that anyone who wished to use the website had to complete the questionnaires first. As waitlist-control participants were aware that they did not have access to the website immediately, there may have not been such an incentive for them to complete the questionnaires.

Despite numerous email and telephone prompts from the researcher, the response rate from participants in the waitlist-control group was low and it was not possible to conduct any between-group analyses for baseline measures. Follow-up responses to questionnaires were also low in both groups, which

meant that it was not possible to conduct any pre-post analyses for participants in the intervention group.

7.4.2 Relating the findings to the wider literature

There are many examples in the literature indicating that the Internet is a powerful platform for delivering weight loss interventions (chapter 1). Some have argued that more attention is needed to determine the effectiveness and dissemination potentials of Internet-based behaviour change interventions (Bennett & Glasgow, 2009). The effectiveness of web-based weight management interventions has been unclear, where mixed results have been partially attributed to a lack of comparable control groups among different studies (Manzoni, Pagnini, Corti, Molinari, & Castelnuovo, 2011; Neve et al., 2010). An evaluation of the feasibility and efficacy of an internet-based weight management programme for the USA Army exists, though the findings from this study are limited by self-reported body weight data and a lack of a control group (Stewart et al., 2011).

In order to establish whether it would be realistic to conduct a randomised controlled trial for evaluating the effectiveness of the POWeR-RN intervention, this preliminary study aimed to evaluate the feasibility of implementing the web-based weight loss intervention in the RN. The findings from this study suggest that it would be unfeasible to follow the original research design to evaluate the efficacy of the web-based weight loss intervention in a RN sample. However, the findings can be compared to other studies that have found web-based weight loss interventions (e.g. the SHED-IT intervention) can be well-received by participants and achieve clinically important weight loss in men after 1-year follow-up (Morgan, Collins, et al., 2011; Morgan et al., 2012). However, the findings from this research may not be comparable as in one study, the sample consisted of overweight and obese male university students and staff, who may have differed in terms of their sociodemographic characteristics, their lifestyle and commitments, and their perceptions of weight management from the sample of overweight and obese RN personnel (Morgan et al., 2012). In another study, the sample consisted of overweight and obese male shift workers in a factory, who may have been

more comparable to the RN sample in terms of their sociodemographic characteristics but may have differed in their perceptions of weight management and their working lifestyle (Morgan, Collins, et al., 2011). It is likely that participants from the general population are not exposed to as much emphasis on exercise and training for weight loss as RN personnel may experience. Additionally, the availability and access to sports facilities for RN personnel is likely to be unmatched for most participants in the general population. Therefore, it may be possible that participants from Morgan and colleagues' studies in the general population may have been more motivated and enthusiastic about engaging with interventions to support their weight loss, since they may not have access to the same amount of support or facilities as RN personnel.

There was a 40% attrition rate from baseline to follow-up at 12 weeks for weight measurements and a higher attrition rate for completing questionnaire measures. A systematic review of predictors of attrition in weight loss interventions found that attrition ranged from 10% to more than 80% but that due to inconsistencies in variables explored and the large variety of study settings and methodologies, no robust predictors of attrition could be identified (Moroshko, Brennan, & O'Brien, 2011). In another review, retention rates for web-based weight loss interventions were reported as ranging from 20% to 100%, with most studies reporting less than 80% retention (Neve et al., 2010). An association was reported between intervention features and retention, where interventions that required less involvement from participants had higher retention rates.

Based on the findings from the RN sample, there did not appear to be any major differences between participants who completed the study and nonresponders based on their demographic characteristics or responses to questionnaires. This is in contrast to other studies that have mostly reported higher retention among control group participants compared to participants in the web-based weight loss intervention group (Carr et al., 2008; Morgan et al., 2009; Neve et al., 2010). This may have been related to the difficulty of arranging an opportunity to take follow-up measures with working personnel and physical training instructors. Whereas those who were in the intervention group are more likely to feel that they are a part of the research study and understand the need for follow-up measures, it may be that participants in the

waitlist-control group did not have the motivation to have their follow-up measures taken.

A review of web-based interventions for improving diet and increasing physical activity found small to medium effects of these interventions (Norman et al., 2007). The moderate effect found for the POWeR-RN intervention on weight loss is comparable to the effects of other web-based weight loss interventions. As this was a small-scaled feasibility study, the reported observations are based on exploratory analyses as the sample size does not allow for any conclusions to be drawn.

7.4.3 Implications for the Royal Navy

There are several implications that arise from this study. First, the evaluations of the RE-AIM dimensions have highlighted several avenues for improving research into the possibility of trialling and implementing the web-based weight loss intervention for overweight and obese RN personnel. In terms of the reach of the study, it was not possible to ensure that all eligible personnel were made aware of the study. It is possible that some eligible personnel who may have benefitted from the intervention did not receive information about the study. There are currently plans for introducing a database for tracking all RN personnel's height, weight and waist circumference measurements. In the future it may be possible to send letters or emails about studies related to weight loss to all individuals who may be at risk for developing obesity-related conditions. It is also the case that physical training instructors hold one-to-one discussions with personnel after completing the RNFT if they fall into the increased risk zone of the NICE guidelines. Therefore it could be worth considering whether this would be a good opportunity for physical training instructors to introduce the weight loss website.

Although participants who engaged with the website did lose more weight than participants who did not use the intervention, motivation to engage with the website was low. Interventions for increasing personnel's autonomous motivation to lose weight may be required in order to improve engagement with weight loss interventions. This could take place during one-

to-one discussions personnel may have with physical training instructors, which are intended to promote motivation for weight management.

The adoption of the study design by four out of five RN bases is reassuring; however, in the absence of the support from DNPD, it is unlikely that it would be possible to carry out the research. Some level of involvement from the DNPD would be necessary for ensuring a working relationship between external researchers and contacts within the RN bases. This was also a beneficial relationship as it was good for potential participants to see that the research is endorsed by DNPD.

The implementation of the study suggests that there are barriers to participants' engagement with the intervention and unless these barriers are addressed, it is unlikely that the intervention would be well-received. Participants' low levels of engagement with the intervention could have been due to a lack of motivation to lose weight and/or a lack of interest in using the intervention. This has important implications for developing more appropriate interventions for supporting overweight and obese RN personnel to manage their weight.

Participants' reasons for not engaging with the intervention appeared to be partly due to a lack of motivation to lose weight. Based on participants' relative autonomy index scores, these scores appeared similar to participants who were in the preparation stage of the stages of change model (Mullan & Markland, 1997). Consequently, an intervention that incorporates motivational interviewing techniques may increase some personnel's autonomous motivations to lose weight and help them move to the implementation stage. The literature suggests that people who have high levels of autonomy may be more likely to take responsibility for their weight management and engage in behaviours to achieve this outcome (Levesque et al., 2007).

In addition, it appeared that most participants were not interested in pursuing the use of the POWeR-RN intervention. There are several potential reasons as to why this may be the case. Firstly, the qualitative work presented in chapter 4 suggested that participants perceived that exercising and training were the main strategies emphasised by the RN for achieving a healthy weight. The intervention was originally designed for middle-aged obese primary care patients and the content predominantly focused on dietary advice, which may

not have been perceived as relevant for managing weight by a relatively physically active sample. Web-based weight loss interventions that specifically target younger men with lower levels of education, such as the SHED-IT intervention, may be better received by this population (Morgan, Collins, et al., 2011). Secondly, the main point of contact for the researcher and participants in relation to this study were physical training instructors. Physical training instructors' involvement with the study may have inadvertently reinforced the emphasis on physical activity, leaving some participants uninterested in this predominantly dietary focused intervention. Based on communications with physical training instructors, it appeared that most participants were not interested in taking advantage of the opportunity for a meeting with physical training instructors, suggesting that participants might not have wished to meet with physical training instructors or did not see the need. It is possible that a different source of support might be beneficial, such as peer support. Lastly, it would be expected that if participants were motivated to engage with the intervention, a larger number of participants in the waitlist-control group may have completed baseline and follow-up measures in order to access the intervention; however, none of the participants completed these measures.

Some trained RN personnel at the participating bases, usually those of higher ranks, would normally have access to the Internet during working hours. RN personnel undergoing training, who live in accommodation in bases, pay to use the Internet. In order to take part in the study, all participants had stated that they had access to a computer and Internet. It would have been useful to evaluate differences between participants with office-based positions compared to participants with non-office-based jobs. In addition, it might be useful to know more about when personnel preferred to access the website, as some personnel may not have received support to complete the intervention sessions during work time. However, in the current sample only 3 officers had signed up to the study, with the majority of the sample consisting of ratings. This suggests that most participants would not have had access to a computer during work hours but would have had to access the website in their own time. One of the themes presented in chapter 4 highlighted participants' unwillingness to engage in weight loss behaviours during their own time but that they would be willing to engage in them during working hours. Therefore increased support from divisional officers to enable their staff to engage with

the weight management intervention during working hours might also help promote engagement.

7.4.4 Strengths and limitations

This study was designed to evaluate the feasibility of implementing a web-based weight loss intervention for overweight and obese RN personnel. There are several strengths of this study. First, this study was conducted in a sample that is currently underrepresented in the weight management literature, i.e. young men with lower levels of education (Elfhag & Rössner, 2005; Garip & Yardley, 2011). Secondly, this study demonstrates that although the web-based weight loss intervention was well-received in one context (primary care participants), this does not necessarily generalise to other populations, in this case, the RN (Yardley et al., 2013). This study may have higher ecological validity compared to other weight management interventions as there was no introductory sessions with participants and no incentives were given for taking part in the study. The final strength of this study is that the importance of conducting and evaluating a feasibility study is highlighted. Based on the current findings, it would be premature to conduct this study in its current form on a larger scale and several addressable barriers were identified before the intervention may be well-received in this sample.

There are some limitations of this study. Participants were recruited offline, in person, by physical training instructors and by the researcher for an online intervention. Recruiting participants via online means may have captured participants that may have been more likely to engage with the intervention. In addition, although the same equipment was used to measure participants' height, weight and waist circumference where possible, it was not always feasible to use the same equipment which may have led to some measurement errors. The Treatment Self-Regulation Questionnaire did not include any items relating to amotivation. This was due to the assumption that participants signing up to the study would have some level of motivation to losing weight and using the intervention. The addition of these items may have been informative for assessing participants' level of amotivation. However, the average relative autonomy index suggested that participants reported that

wanting to lose weight was an autonomously driven decision. Nevertheless, usage of the website was low and weight loss over 12 weeks was also low. The fact that participants could be sent on deployment at any time meant that some participants could not be contacted for their follow-up measurements and they could not complete the follow-up questionnaires. Finally, this was a descriptive study, and therefore the findings cannot be used to draw any conclusions about the effectiveness or efficacy of the website.

7.4.5 Conclusion

The RE-AIM framework was used to guide the evaluation of the feasibility for trialling and implementing the POWeR-RN intervention for overweight and obese personnel in the RN. Several barriers were identified that need to be addressed in order to increase personnel's interest and engagement with the intervention in future trials. The four barriers identified in this study, which are complemented by the findings in chapters 4 and 5, that need to be addressed include 1) increasing some RN personnel's autonomous motivation for losing weight, 2) increasing some RN personnel's awareness about the importance of diet for losing weight, in addition to engaging in exercise 3) ensuring that those providing support for users of the intervention are trained in behaviour change approaches, and 4) investigating options for introducing elements of weight management interventions that have specifically been designed for young men with lower levels of education, into the POWeR-RN intervention. The next chapter integrates the findings from this programme of research and highlights their implications for the RN.

8. General Discussion

8.1 Chapter overview

The final chapter in this thesis presents the implications and contributions of this programme of research for the Royal Navy (RN) on the feasibility of web-based behavioural weight loss interventions. First, a summary of the main findings from previous chapters will be presented, followed by an integration of the main findings, and their significance and implications for the RN and the wider literature. Following a discussion of the strengths and limitations of this research, the chapter will end with the researcher's conclusions for the thesis overall.

8.2 Summary of the main findings

This section summarises the key findings of the empirical chapters presented in this thesis. Chapter 2 aimed to systematically review and synthesise the literature on overweight and obese people's perceptions of and experiences with behavioural weight management programmes. The chapter argued that the effectiveness of weight management interventions may be improved by addressing the factors overweight and obese people perceive as affecting their weight management efforts. In doing so, weight management interventions' credibility and acceptability for users may be increased, which may lead to greater user engagement, adherence, and ideally, successful weight management. A broad-ranging conceptual model was derived of the biopsychosocial factors that may be related to overweight and obese people's experiences with weight management programmes and the outcomes of their participation in these programmes. Some participants described interventions as providing social support and a sense of belongingness, which participants valued, even in interventions where weight loss was not achieved. In other interventions, there appeared to be tension between the need for structure in the intervention and participants' need for autonomy.

The survey study presented in chapter 3 aimed to determine whether there was scope to introduce a web-based weight loss intervention (i.e. POWeR-

RN) to overweight and obese personnel in the RN. The items included in the survey were loosely based on a selection of the Theory of Planned Behaviour constructs (Ajzen, 1991). The study examined overweight and obese participants' desire and perceived behavioural control to lose weight, beliefs about the effectiveness of using a weight loss website, and perceived behavioural control to use a weight loss website. The key findings from this study were that a high proportion of overweight (79%) and obese (93%) personnel reported that they desired to lose weight, and 78% and 81% of overweight and obese personnel, respectively, reported they were confident they would be able to use a website for supporting their weight loss attempts. When participants were asked about whether they thought a web-based weight loss programme would be useful in supporting them with their weight loss efforts, 58% of overweight participants and 68% of obese participants reported that they thought it would be useful. In particular, obese personnel and female personnel appeared more likely than male personnel and overweight personnel to report that using a web-based weight loss programme would be effective for achieving weight loss. Based on these preliminary findings it was concluded that, for some RN personnel, a web-based weight loss programme may be a suitable resource for supporting their weight loss efforts.

The study presented in chapter 4 aimed to understand overweight and obese RN personnel's dietary and physical activity habits and weight management experiences in the RN. Findings from this study were also used to inform modifications to the existing web-based weight loss intervention, i.e. POWeR, for contextualising the content to the RN environment. The sample reported a range of perceived barriers and facilitators in the RN that may be related to their efforts to manage their weight. Where possible, these factors were used to inform changes to the existing web-based weight loss intervention during the intervention modification process (chapter 6). Overweight and obese RN personnel's perceived reasons for successful and unsuccessful weight management were identified, which had implications for understanding participants' engagement and non-engagement with the intervention in subsequent studies. First, some participants perceived physical activity and training as being the main method for achieving and maintaining a healthy weight. Talk about changing unhelpful eating habits was limited and some participants stated their unwillingness to adopt healthier eating habits.

Secondly, some participants expressed a desire for wanting to engage in weight loss behaviours during their working hours in the RN, but not during times when they were not working. This suggested that some overweight and obese personnel did not perceive weight management as a personal responsibility but rather they perceived that it was the RN's responsibility to provide them with the time and resources for them to manage their weight. The RN culture was described as promoting unhealthy eating and drinking habits, which may be a major barrier to changing dietary behaviours.

The study presented in chapter 5 aimed to explore overweight and obese RN personnel's perceptions of and experiences with using the modified web-based weight loss intervention, i.e., POWeR-RN. The views of a predominantly male sample, half of whom engaged with the web-based weight loss intervention, and half of whom did not engage with the intervention, except for the first session, were presented. Most participants' reasons for wanting to lose weight and engaging with the intervention could be categorised as being extrinsically driven, which included passing the fitness test and securing their position in the RN. Some participants reported that the RN culture promoted exercising and increasing levels of physical activity as the main acceptable method for achieving weight loss among overweight and obese personnel. The content of the POWeR-RN intervention mostly focused on making long-term dietary changes to achieve healthier dietary habits. Some participants felt that in the absence of any human support, they would be unlikely to engage with the POWeR-RN intervention. This finding led to the inclusion of physical training instructors for supporting recruitment, data collection and providing support to participants in the intervention group in the feasibility study (chapter 7).

Chapter 7 presented a feasibility study for trialling and implementing a web-based weight loss intervention, i.e. POWeR-RN, for overweight and obese personnel in the RN. Based on the recruitment rates across five selected RN bases, it was estimated that approximately 6% of all eligible personnel registered to take part in the study. Participants in the intervention group were more likely than participants in the waitlist-control group to complete baseline questionnaires, suggesting that participants in the waitlist-control group were not sufficiently keen to complete online questionnaire measures to gain access to engage with the intervention. Participants in the intervention group who

engaged with the intervention, on average, used 1.5 out of 11 sessions and, on average, lost around 2kg in 12 weeks. Based on the average number of sessions used, the average weight loss recorded was in line with the recommended rate at which users should aim to lose weight (National Institute for Health and Clinical Excellence (NICE), 2006). The preliminary findings suggest that the POWeR-RN intervention may prove efficacious in a definitive trial once identified barriers have been overcome to improve engagement with the intervention. The identified barriers were participants' lack of autonomous motivation to lose weight and their perceptions about weight management within the RN culture that interfered with adopting behaviours to enable weight loss. It is unclear whether physical training instructors inadvertently influenced some participants not to use the POWeR-RN intervention, since physical training instructors did not appear particularly committed to recruiting participants to the study or to arranging supportive meetings with participants as per the study protocol. In this study, some participants were already in regular contact with a physical training instructor as a result of failing their fitness test. The personal support some participants got from physical training instructors may have reduced the attractiveness and appeal for engaging with the web-based weight loss intervention.

8.3 Triangulating the findings of the empirical chapters

Methodological triangulation refers to the use of more than one method to gather data pertaining to a specific aim (Tashakkori & Teddlie, 2003). In this programme of research, the aim was to determine whether there was scope in the RN to implement and trial a modified web-based weight loss intervention (i.e. POWeR-RN) in the RN. This section aims to integrate the findings from the individual quantitative and qualitative chapters in the thesis to explain why some RN personnel engaged with the intervention, while others did not. Three themes emerged from this integration: i) the RN culture and how it may influence personnel's weight management; ii) motivational issues with managing weight; and, iii) physical training instructors' involvement in the studies.

Overweight and obese RN personnel generally reported perceiving that increasing levels of physical activity and exercising were the accepted method for losing weight in the RN (chapter 4 and 5). Most participants who took part in the studies reported being physically active and this strategy was perceived by some to be sufficient for losing weight. Some personnel described resistance and unwillingness to make dietary changes to achieve weight loss. This is in line with male discourses around dieting and weight loss, where making dietary changes is perceived as being a more feminine behaviour (De Souza & Ciclitira, 2005). The emphasis on physical activity in the RN culture and the emphasis on dietary changes in the website may have been incompatible for capturing the attention of some RN personnel to engage with the intervention.

The RN culture was described by some participants as promoting unhealthy eating and drinking habits (chapter 4). The dining halls at RN bases were reported as providing high calorie and low calorie food choices. Most participants reported that they tended to select food that was higher in calories because it was more appealing and less costly compared to the healthier food choices. Some participants also mentioned the drinking culture in the RN as an important social experience for RN personnel, particularly for people recently joining the RN. Some participants explained that rather than choosing healthier beverages in a social gathering with other RN personnel, they would rather not socialise, suggesting that the drinking culture and RN personnel's social life may be closely linked. In light of these perceptions, for some RN personnel, attempts to making healthier beverage choices may interfere with their social life.

There were some similarities between overweight and obese RN personnel's perceptions of the factors that may be involved in their weight management and the perceptions of overweight and obese civilians. Several themes identified in the qualitative chapters (4 and 5) overlapped with the factors identified in the systematic review (chapter 2) including attributions for weight gain (e.g. attributing weight gain to unhealthy eating habits) and environmental barriers (e.g. availability of tempting unhealthy foods). However, there were some themes that were identified from the qualitative studies that related specifically to the RN context, such as the influence of the RN culture on weight management, the responsibility of personnel's weight management

being attributed to the RN instead of the individual and personnel's external reasons for wanting to lose weight. The participants in the studies selected for the systematic review may have been more autonomously motivated to lose weight compared to the samples recruited in the RN, based on their levels of engagement with the interventions.

According to Self-Determination Theory (SDT), three basic psychological needs, i.e. autonomy (being responsible for one's behaviour), competence (feeling capable of engaging in a particular behaviour), and relatedness (feeling a sense of closeness with others) need to be satisfied to foster autonomous motivation (i.e. personally valued reasons for engaging in a behaviour) (Deci & Ryan, 2000). The RN, like other branches of the military, is a hierarchically structured environment where personnel of lower ranks receive orders from personnel in higher ranks. While the RN environment is likely to foster a sense of competence and relatedness among its personnel, the RN environment may not be well-suited for promoting autonomy. In terms of weight loss, findings reported in chapters 4 and 5 suggest that some overweight and obese personnel were not willing to take personal responsibility for losing weight. Commonly cited reasons for wanting to lose weight included ensuring job security in the RN and passing the RN fitness test, which can be categorised as external motivation. Additionally, participants also stated that they may be more likely to engage with the intervention if it was compulsory or if they could use the intervention during work hours, which may suggest a reluctance to take personal responsibility for one's excess weight (chapter 4 and 5). The SDT posits that external motivation for engaging in health behaviours may lead to poorer outcomes (Deci & Ryan, 2000). Low levels of autonomous motivation is likely to be incompatible with the philosophy of the POWeR intervention that assumes users will be autonomously motivated to engage with the intervention and to regulate their behaviours to lose weight.

An existing behavioural weight loss intervention implemented in the RN during working hours that does not rely as much on individuals' autonomous motivation gathers groups of 5-15 personnel each week, mostly on a mandatory basis. The intervention, namely Healthy Lifestyle classes, is organised and delivered by physical training instructors and is compulsory for obese personnel and personnel who fail their fitness test. The intervention consists of a group of obese personnel who engage in various sports activities

for an hour each week. These classes were also accessible to non-obese personnel but based on communications with physical training instructors, there was limited interest in these classes from personnel who were not obliged to take part in the classes. Physical training instructors monitored participants' weight and waist circumference on a weekly or monthly basis. The structure of this intervention may not promote self-regulation and personal responsibility for participants; instead the intervention is implemented on the basis that participants are accountable to physical training instructors. Furthermore, the frequency of these classes may have inadvertently incorrectly suggested to some participants that exercising once a week was enough to lose weight. Despite this mandatory scheme, there was a high prevalence of overweight and obese personnel suggesting that interventions of this nature did not provide a solution to the problem.

Evidence from the literature suggests that human support could improve participants' engagement with and adherence to weight loss interventions delivered via the Internet (Khaylis et al., 2010). Additionally, participants reported that a sense of accountability may increase their likelihood in engaging with the POWeR-RN intervention (chapter 5). The Director of Naval Physical Development (DNPD) selected physical training instructors from each of the chosen bases to be involved in delivering support to participants in the intervention group in the feasibility study (chapter 7). The researcher met with all the physical training instructors in an informational meeting to inform them about the aims of the study and to provide training on how physical training instructors should deliver the supportive meetings with participants. The researcher also met with physical training instructors at their respective bases on several occasions and stayed in regular contact via emails and by telephone for the duration of the study. Physical training instructors were the researcher's main point of contact for gaining access to bases and for recruiting potential participants. The researcher and physical training instructors had good rapport. Physical training instructors appeared enthusiastic about the study and intervention during meetings with the researcher; however, there were no records of the interactions that took place between physical training instructors and participants.

Physical training instructors involved in recruiting participants to the study and providing support for users of the intervention would themselves

have needed to be intrinsically motivated to support POWeR in order to prevent inadvertently discouraging participants from using the intervention. It was revealed that physical training instructors were not able to coordinate the supportive meetings with participants in the intervention group. Despite the lack of support, some participants did engage with the POWeR-RN intervention and some weight loss was recorded. This suggests that for some personnel the POWeR-RN intervention may be a useful tool to support their efforts to lose weight.

8.4 Practical implications for the Royal Navy

Some personnel's perceptions of how to lose weight appeared to be influenced by their beliefs around the eating and drinking culture, and increasing exercise levels for losing weight in the RN. The RN culture was described as fostering unhealthy dietary habits. It appeared that the perceived norm in the RN for developing fitness and managing one's weight was by engaging in exercise. Normative beliefs may interfere with some personnel's willingness to engage with the advice provided in weight loss interventions if there is an inconsistency between the RN culture and intervention content.

The content and focus of the POWeR-RN intervention was to support users in developing an eating plan that could be tailored to individuals' circumstances. Given some personnel's unwillingness to change their eating habits, it is not surprising that most personnel did not appear to be interested in engaging with the intervention, as reported in chapter 5 and observed in chapter 7. Also, participants' perceptions of increasing physical activity levels as their main strategy for losing weight may have left some participants uninterested in the intervention content, which mainly focused on dietary changes to achieve weight loss. This programme of research may contribute to shifting the culture toward making dietary changes for weight loss more mainstream and acceptable for overweight and obese personnel.

In light of the findings in chapter 4 that were presented to the RN, one of the main recommendations was to restructure the dining environment so that personnel were exposed first to healthier food choices and then to less healthy ones. These relatively easy and quick environmental changes aim to

encourage more personnel to make healthier choices about their diet, which is in line with Nudge Theory (Thaler & Sunstein, 2008). The collaborator from the Institute of Naval Medicine (INM) informed me that this recommendation was being taken into consideration in the design of the dining areas in new Type-45 ships.

Overweight and obese RN personnel receive much support in their efforts to lose weight compared to people trying to lose weight in the general population. In addition to the access personnel have to sports facilities; personnel can also seek support from physical training instructors and medical staff. The involvement of others in one's efforts to manage their weight may reduce some overweight and obese RN personnel's sense of personal responsibility for managing their weight. Also, the hierarchical structure of the RN is unlikely to foster a sense of autonomy in ratings (personnel of lower ranks) who are obliged to follow orders from officers. Ratings constituted a majority of the personnel taking part in the studies. In an environment that may not promote a sense of personal responsibility or autonomy, it is not surprising that some personnel reported unwillingness to engage in weight management behaviours in their own time. Instead, some participants reported that they felt it was the RN's responsibility to provide time and resources to personnel in need of support for losing weight. Interventions that aim to increase overweight and obese RN personnel's autonomous motivation to lose weight could lead some personnel to engage with interventions for self-managing their weight.

Web-based weight loss interventions delivered in conjunction with existing weight loss interventions in the RN, such as the Healthy Lifestyle classes, could provide additional support to overweight and obese personnel when support from physical training instructors may not be available. Furthermore, the sense of accountability to physical training instructors or health professionals may be necessary for some personnel to engage with the intervention. This was how the delivery of the POWeR-RN intervention was conceptualised in the feasibility study protocol; however, it appeared that most physical training instructors may not have been enthusiastic about the intervention.

The POWeR intervention was originally designed for obese, middle-aged, primary care patients. The qualitative findings from chapters 4 and 5 were useful for informing modification to the existing web-based weight loss intervention (chapter 6). Due to time restrictions, the modifications that were undertaken and reported in chapter 6 were intended to ensure that the content of the website was as relevant to overweight and obese personnel as possible. The overall tone and structure of the intervention remained the same as the original intervention, which may not have been well-suited for overweight and obese RN personnel (chapter 6). More intensive modifications to ensure that the tone of the intervention is more oriented towards young men with lower levels of education may improve engagement with the intervention. At the time this thesis was being written, there were plans to further modify the POWeR-RN intervention to trial it among overweight and obese military personnel in rehabilitation.

It appears that compared to other weight loss interventions for overweight and obese RN personnel, the web-based weight loss intervention did lead to weight loss among website users over 12 weeks. A lack of a formal evaluation of other weight loss interventions in the RN makes it difficult to compare the efficacy of the POWeR-RN intervention with existing interventions in the RN. It is recommended that weight loss interventions implemented in the RN are evaluated to determine whether the desired outcomes are being achieved, or to determine the next steps that need to be taken if the intervention is not successful. The fact that the POWeR-RN intervention was evaluated in the RN context affords a major advantage over other weight loss interventions in the RN that lack a formal evaluation. The findings from this programme of research have led to practical implications for the RN and have resulted in suggestions for improving support for overweight and obese personnel. It is intended that this thesis sets a precedent for the evaluation of existing and future weight loss interventions delivered in the RN.

One of the aims of this programme of research was to identify feasible ways for recruiting overweight and obese RN personnel to the studies. For the qualitative studies reported in chapters 4 and 5, physical training instructors had an important role of informing potential participants about the studies and facilitating correspondence between the participant and the researcher. While this strategy worked for recruiting relatively small samples for interviews, more

intensive strategies were adopted for recruiting participants to the feasibility study. Several brief presentations were given at bases to large numbers of RN personnel and recruitment desks were set up near dining halls and sports centres to raise the visibility of the study. Some of these strategies were fruitful for recruitment at some bases. It appears unlikely that one recruitment strategy that works in one base would work at another base. For one base, a successful recruitment strategy was not found. More officers than ratings tended to work at the base where no participants were recruited, suggesting that alternative methods should be explored for accessing RN personnel of higher ranks. Engaging overweight and obese officers in weight management interventions may be particularly important for setting an example for ratings. Overweight and obese officers who do not engage in weight management may lead to ratings perceiving that being overweight or obese is acceptable.

Some participants who took part in the studies reported in chapters 4, 5 and 7, were also taking part in the Healthy Lifestyle classes (chapter 1.3.3 and chapter 8, paragraph 6). The fact that some overweight and obese personnel were already involved in an intensive intervention for increasing their levels of physical activity may have reduced the appeal and relevance of the POWeR-RN intervention for some personnel. Furthermore, it is debatable whether these intensive recruitment strategies would be conducted in practice.

8.4.1 Suggestions for improving engagement with web-based weight loss interventions for overweight and obese Royal Navy personnel

Preliminary findings from the feasibility study suggest that the uptake of the POWeR-RN intervention was comparable to the uptake of web-based weight loss interventions in primary care, workplace and community samples (Bennett & Glasgow, 2009). Weight loss was observed among participants who engaged with the intervention, though engagement with the website could be considered quite low; on average, participants accessed 1.5 sessions out of a possible 11 sessions in the intervention. The following suggestions are based on the evidence integrated from the aforementioned studies in this thesis, with

the aim to improve overweight and obese RN personnel's engagement with the web-based weight loss intervention.

Based on the findings reported in chapter 4 and the researcher's observations during the feasibility study (chapter 7), it appears that physical training instructors and medical staff had a directive approach towards supporting personnel wanting to lose weight. This is in contrast to the approach taken in the POWeR intervention, which was designed to give users psychological behaviour change tools (e.g. goal-setting, planning) to support their weight loss efforts and avoids telling users what they should do. The POWeR intervention assumes that users will be autonomously motivated to lose weight; however, based on the findings, it appears that a majority of participants reported wanting to lose weight due to external motivations. Autonomous motivation to lose weight has been associated with increased adherence to a weight loss intervention and to losing weight (Webber, Tate, Ward, & Bowling, 2010). There may be opportunities for Health Psychologists and/or other health professionals trained in designing and delivering behaviour change interventions and motivational interviewing to promote autonomous motivations in overweight and obese RN personnel to self-regulate their weight.

For overweight and obese RN personnel, it may be necessary to design an intervention that specifically targets young men with lower levels of education, such as the SHED-IT intervention, that uses humour and male-oriented language for promoting behaviours associated with losing weight (Morgan et al., 2009). However, re-designing and developing a web-based weight loss intervention is costly both in terms of funds and time. A more feasible suggestion is to rewrite the content of the POWeR-RN intervention, so that the overall tone and ethos is one that users can relate to.

Ethnographic approaches are well suited for understanding the culture of a group and could be adopted to understand the psychosocial cues that may influence overweight and obese RN personnel's dietary decisions and their decisions around engaging in physical activity (Wolcott, 1990). Findings from such research could guide the development of a web-based weight loss intervention that takes into account overweight and obese RN personnel's experiences and is in line with their communication style.

Interventions at the organisational level may also be needed, as highlighted by RN personnel's perceptions of the RN culture and the incompatibility these posed with regards to the intervention content. Interventions that emphasise the importance of one's dietary intake for managing one's weight could influence some personnel's willingness to make dietary changes to achieve weight loss. At the organisational level, restructuring the dining halls so that healthier food options precede less healthy food choices in the food line may encourage some personnel to make healthier dietary choices. Restructuring the environment where personnel dine may encourage some to make healthier dietary choices, which may influence their perceptions about the role of diet for achieving weight loss (Thaler & Sunstein, 2008). In order to establish cultural norms around healthy eating, ways of engaging officers and senior personnel need to be identified.

The survey study presented in chapter 3 identified that obese personnel and female personnel were especially interested in using a web-based weight loss intervention. However, in the feasibility study presented in chapter 7, there were only four female participants in the sample. The small sample of female participants meant that it was not possible to determine whether female participants were more likely to engage with and/or benefit from the intervention. During recruitment for the feasibility study, female personnel may have been missed. Recruitment strategies for targeting female RN personnel are needed.

8.5 Strengths and Limitations

This is the first programme of applied research that explores overweight and obese RN personnel's experiences of weight management, and evaluates the feasibility of trialling and implementing a web-based weight loss intervention in the RN. This thesis draws on the strengths of qualitative and quantitative research methods to address limitations of the different methods.

Triangulation of the findings from the individual empirical chapters enabled the development of a more comprehensive and integrated understanding of personnel's perceptions of weight management, and their reasons for engagement and non-engagement with the web-based weight loss intervention.

Participants' perceptions of the web-based weight loss intervention made it possible to provide explanations for the findings of the feasibility study.

In chapter 2, a systematic review of overweight and obese people's experiences with behavioural weight management programmes were presented. As there was limited qualitative research exploring overweight and obese people's perceptions and experiences with web-based behavioural weight management interventions, the findings of such a review would have also been limited. Hence, the review took a broader focus, which may have wider utility for those developing and delivering behavioural weight loss interventions.

The survey study conducted in a large stratified random sample presented in chapter 3 was useful for establishing that there was some interest from overweight and obese personnel to use a web-based weight loss intervention. Due to space limitations in the survey, it was only possible to include four items. Although there were many limitations of the items, the survey reached a much larger sample than in all the other studies presented in this thesis put together. The sample responding to this survey had been participating in a longitudinal survey study. The short survey was nested within a larger survey. The response rate to the survey was 67%. The general focus of the survey was on assessing stress levels and health; participants who responded to the survey may have been more concerned about their health compared to nonresponders, which may have resulted in an overestimation in the proportion of overweight and obese personnel interested in using a web-based weight loss intervention.

The rich descriptions and explanations from overweight and obese personnel reported in chapters 4 and 5, were useful for providing insight into the samples perceptions of weight management and the intervention, and their reasons for (non-) engagement with the intervention. The findings are limited to these samples as they cannot be generalised to all overweight and obese RN personnel. Chapter 7 reported the findings from the feasibility study for implementing the modified web-based weight loss intervention. The study was useful for evaluating processes related to the reach, efficacy, adoption, and implementation of the intervention. Due to the data collection period lasting 12 weeks, it was not possible to evaluate whether the intervention could be

maintained in the longer term, however given the findings, it appears that engagement with the intervention tends to decline after 2 weeks, which suggests that users may not engage with the intervention in the long term unless the suggested changes are made or prove effective. The feasibility study was not designed to evaluate, nor does it make claims about, the effectiveness of the web-based weight loss intervention for overweight and obese RN personnel.

8.6 Conclusion

This is the first programme of applied research that modified an existing web-based weight loss intervention, and evaluated the feasibility of trialling and implementing the modified web-based weight loss intervention for overweight and obese RN personnel. This thesis has laid the foundations for developing our understanding of overweight and obese RN personnel's perceptions of and experiences with a behavioural web-based weight loss intervention. Those who engaged with the intervention did achieve desired outcomes and suggestions were presented for improving engagement with the behavioural web-based weight loss intervention among overweight and obese personnel.

The findings from this thesis contribute to and inform weight management in the RN in three ways. First, in an environment where the main methods for achieving and maintaining physical fitness and a healthy weight is perceived as being by engaging in exercising, an intervention that mostly focuses on changing dietary habits may not be well received. This highlights the importance of integrating people's perceptions about how to lose and maintain a reduced weight with the norms of the culture. Interventions at the organisational level that target perceptions of weight management in the RN culture may be beneficial. Involving physical training instructors in this research programme may have inadvertently reinforced personnel's beliefs about physical activity and exercising as the primary way for achieving weight loss. This research programme may have contributed to making dietary changes for weight loss more mainstream among some overweight and obese RN personnel.

Secondly, the preliminary findings suggest that even in a relatively unsupportive environment, due to the absence of support from physical training instructors and incompatibility between intervention content and cultural beliefs around weight management, some personnel were autonomously motivated to engage with and benefit from the POWeR-RN intervention. Introducing interventions to foster autonomous motivation, such as through motivational interviewing, for overweight and obese personnel to lose weight, could improve engagement with weight loss interventions for some personnel. And lastly, the overall tone of the POWeR-RN intervention may not have been particularly well-suited for young men with lower levels of education. Further modifications to the POWeR-RN intervention are needed to improve the extent to which overweight and obese RN personnel can relate with the content.

Appendices

Appendix A: Quality assessment

Appendix A – Quality assessment of included studies according to the CASP criteria

Study	Qualitative research	Purpose of study	Qualitative methods appropriate	Theoretical perspective	Ethics
Davis	S	S	P	N	S
Visram	S	S	S	N	S
Fogel	S	P	S	N	S
Bidgood	S	S	S	N	S
Lopez	S	S	S	S	N
Adolffson	S	S	S	P	S
Johnson	S	S	S	N	N
Van	S	S	S	N	S
Groven	S	S	S	P	S
Barberia	S	S	S	P	S
Miles	S	S	P	N	S
Herriot	S	S	S	N	S
Jones	S	S	S	N	S
Burke	S	S	S	N	S
Sabiston	S	S	S	P	S
Greener	S	S	S	P	S
Cioffi	S	S	S	N	S

Study	Sample	Data collection	Analysis	Reliability Validity	Credibility Rigor	Transferability
Davis	P	P	P	P	P	P
Visram	S	S	S	P	P	P
Fogel	S	S	S	S	P	S
Bidgood	S	P	P	P	P	P
Lopez	P	S	P	P	N	N
Adolffson	S	P	P	P	P	P
Johnson	P	P	P	S	S	S
Van	P	S	P	P	P	P
Groven	S	P	S	P	S	P
Barberia	S	S	P	P	S	P
Miles	S	P	N	N	N	P
Herriot	S	S	P	P	P	N
Jones	S	S	P	P	S	P
Burke	S	S	S	P	S	P
Sabiston	S	P	S	S	S	N
Greener	P	P	P	P	P	P
Cioffi	S	S	S	P	P	N

Appendix B – Coding manual for Meta-Ethnography

Experiences of weight management programmes

- Inclusion criteria: Themes related to the influences of participants' interactions with peers and health professionals in the weight management programme, and participants' experiences in the programme on their weight management behaviours.
- Exclusion criteria: Themes related to behavioural and psychological changes as a result of participating in a weight management programme, or interactions with peers and health professionals in the weight management programmes.

Valued support from contact with peers and health professionals

- Ongoing professional and peer support (Visram *et al.*, 2009)
- Support and affirmation in the group sessions (Lopez, 1997)
- A common ground (Groven *et al.*, 2010)
- Support from peers (Herriot *et al.*, 2008)
- Group support (Burke *et al.*, 2009)
- Support from peers and health professionals (Greener *et al.*, 2010)
- One-to-one support (Greener *et al.*, 2010)
- The environment of the group meetings (Fogel *et al.*, 2009)
- The weight loss program (Fogel *et al.*, 2009)

Feeling obliged to attend weight management programme

- Pressure from health professionals (Barberia *et al.*, 2008)
- Being part of a research study (Burke *et al.*, 2009)

Aspects of weight management programmes that are liked and preferred

- Tailoring interventions to individual needs and preferences (Visram *et al.*, 2009)
- Client as expert (van Zandvoort *et al.*, 2009)
- Preference for in-person coaching (van Zandvoort *et al.*, 2009)
- Desire to make personal choices (Lopez, 1997)
- Searching for safety (Fogel *et al.*, 2009)
- Safety and acceptance (Fogel *et al.*, 2009)

Experiences that conflicted with attempts to manage weight in the programmes

- Control imposed by the weight program sometimes conflicts with autonomous thought and behaviour (Lopez, 1997)
- Lack of support from the weight reduction programme (Adolfsson *et al.*, 2002)
- Knowing the programme (Cioffi, 2002)

Dependence on weight management programme

- Perceived need to attend classes (Cioffi, 2002)
- Dependence of close follow-up (Groven *et al.*, 2010)
- The lifestyle change needed to overcome obesity can seldom be maintained without on-going help (Bidgood *et al.*, 2005)

Appendix B: Coding manual for Meta-ethnography

-Keeping control of weight management (Cioffi, 2002)

Positive outcomes of participating in a weight management programme

- Inclusion criteria: Themes related to the positive outcomes as an end in itself of participation in weight management programmes on participants' physical functioning, psychological state, behaviours and skills related to weight management, and knowledge about weight management.
- Exclusion criteria: Themes related to participants' views and experiences regarding participation in the weight management programmes, their interactions with peers and health professionals, and the negative effects of participation in weight management programmes. Perceived support from peers, health professionals and the programme which were interpreted as a mediator of weight management are coded under the theme 'experiences of weight management'.

Knowledge and skills

- Monitoring and reinforcement (Visram *et al.*, 2009)
- Eating habits (Adolfsson *et al.*, 2002)
- How the weight reduction programme affected eating habits (Adolfsson *et al.*, 2002)
- Improved knowledge and behavioural techniques regarding weight management (Jones *et al.*, 2007)
- Seeing it in black and white (Burke *et al.*, 2009)
- A tool for staying on track (Burke *et al.*, 2009)
- New knowledge and skills (Burke *et al.*, 2009)

Weight loss

- Reaching the set goal weight (Cioffi, 2002)

Weight loss-related psychosocial benefits

- Improved mood (Jones *et al.*, 2007)
- Improved relationships with others (Jones *et al.*, 2007)
- Community and social support in the weight loss group (Fogel *et al.*, 2009)
- Group involvement (Cioffi, 2002)
- Improved self-acceptance (van Zandvoort *et al.*, 2009)
- Making self a priority (van Zandvoort *et al.*, 2009)

Weight loss-related physical improvements

- Improvements in physical functioning (Jones *et al.*, 2007)

Lifestyle

- Living a healthier lifestyle (van Zandvoort *et al.*, 2009)

Attributions for weight gain and the maintenance of excess weight

Appendix B: Coding manual for Meta-ethnography

- Inclusion criteria: Themes related to participants' attributions to life events, psychological and environmental factors for weight gain and, the maintenance of participants' overweight and obese states when they were not attempting to manage their weight.
- Exclusion criteria: Themes related to psychological, social and environmental barriers to weight management.

Unhealthy behaviours and eating habits

- Unhelpful learned behaviours (Greener *et al.*, 2010)
- Poor family eating habits (Greener *et al.*, 2010)
- Overeating (Greener *et al.*, 2010)
- Eating habits (Miles *et al.*, 2006)

Lack of physical activity

- Lack of exercise (Greener *et al.*, 2010)
- Sedentary job (Miles *et al.*, 2006)

Psychological problems

- Physical/mental health problems (Miles *et al.*, 2006)

Unmodifiable factors

- Genetic predisposition (Greener *et al.*, 2010)
- Illness and disruptive life events (Greener *et al.*, 2010)
- Having children (Miles *et al.*, 2006)
- Overweight as chronic disease (Johnson, 1990)

Sociocultural factors

- Inclusion criteria: Themes related to the influences of the community, sociocultural home and work settings, and food culture on weight management, in and out of the context of weight management interventions.
- Exclusion criteria: Themes related to participants' stigmatising experiences that they attribute to their excess weight, interactions with peers and health professionals in weight management programmes, and sociocultural factors that influence weight gain and the maintenance of excess weight when participants were not attempting to manage their weight.

Encouragement and support

- Family influence and societal expectations (Davis *et al.*, 2005)
- Supportive spouses (Burke *et al.*, 2009)
- The influence of family and friends as triggers to help-seeking and weight loss (Visram *et al.*, 2009)

Negative influences of family/friends

- Family influence and societal expectations (Davis *et al.*, 2005)
- Relationships with others (Jones *et al.*, 2007)

Appendix B: Coding manual for Meta-ethnography

- Normative beliefs and their relationship with subjective norms (Barberia *et al.*, 2008)
- Influence of family members and friends (Lopez, 1997)
- Sabotage by others (Burke *et al.*, 2009)
- Familial pressure to lose weight (van Zandvoort *et al.*, 2009)

Competing responsibilities in everyday life

- Competing family and work responsibilities (Burke *et al.*, 2009)
- Work environment and day-to-day routines (Greener *et al.*, 2010)
- Family commitments, social life and work as barriers (Herriort *et al.*, 2008)
- Lack of time due to home and work commitments (Barberia *et al.*, 2008)
- Family responsibilities and stressful days affected eating habits (Adolfsson *et al.*, 2002)
- Day-to-day routines and life events (Jones *et al.*, 2007)

Societal and cultural influences

- Concerns of obese people are not heard by society in general (Bidgood *et al.*, 2005)
- African American subculture hinders weight management (Davis *et al.*, 2005)

Self-perception and body-image

- Inclusion criteria: Themes related to the influence of weight on participants' positive and negative self-perceptions, and acceptance, satisfaction and dissatisfaction related to perceived body-image.
- Exclusion criteria: Themes related to the influence of sociocultural factors or stigmatising experiences on participants' self-perception and body-image.

Feelings related to having excess weight

- Shame (Fogel *et al.*, 2009)
- Remorse about weight and lifestyle choices (van Zandvoort *et al.*, 2009)
- Self-conscious about weight (van Zandvoort *et al.*, 2009)
- Negative self-perception (Greener *et al.*, 2010)

Relationship with self

- Consolidating one's identity and new way of living as a thin person (Johnson, 1990)
- Coming to terms with self as an overweight/obese person (Johnson, 1990)
- Relationship with self (van Zandvoort *et al.*, 2009)
- Being physically self-accepting: "I like my size because I get to do what I want" (Sabiston *et al.*, 2009)

Improving body-image as a motivation for managing weight

- Motivations to lose weight to improve perceived body-image (Lopez, 1997)

Appendix B: Coding manual for Meta-ethnography

- Motivation to lose weight to improve perceived body-image (Barberia *et al.*, 2008)
- Improving self-image (Herriot *et al.*, 2008)
- Physical self-perception paradox: "It would be lovely to have a better earth suit" (Sabiston *et al.*, 2009)
- Motivation to improving body-image (Greener *et al.*, 2010)

Seeing weight management as a personal responsibility

- Assuming responsibility for lack of self-monitoring (Burke *et al.*, 2009)
- The process of self-perception change: "I can change my destiny; I'm not a victim" (Sabiston *et al.*, 2009)
- Personal responsibility (Greener *et al.*, 2010)

Health concerns related to excess weight

- Inclusion criteria: Themes related to health as a motivation for managing excess weight, in and out of the context of weight management programmes.
- Exclusion criteria: Themes related to motivators for weight management other than health.

Desire to improve health as a motivation to manage weight

- Health as a motivator (Herriot *et al.*, 2008)
- Fear for health motivates weight management (Jones *et al.*, 2007)
- Health as a motivation to manage weight (Greener *et al.*, 2010)
- Health concerns (Visram *et al.*, 2009)
- Desire to improve health (Fogel *et al.*, 2009)
- Improving health (Barberia *et al.*, 2008)

Existing health problems motivate weight management

- Having a greater number of health problems (Miles *et al.*, 2006)

Health professional's concern over excess weight on health is taken seriously.

- Legitimization from health professional (Visram *et al.*, 2009)

Weight management expectations

- Inclusion criteria: Themes related to participants' realistic and unrealistic expectations regarding weight management, in and out of the context of weight management programmes.
- Exclusion criteria: Themes related to expectations regarding the role of family members, friends and society in one's weight management attempt.

Expectations about the process of weight loss

- Bodily discomfort as painful (Groven *et al.*, 2010)

Unrealistic expectations

Appendix B: Coding manual for Meta-ethnography

- Weight loss expectations (Herriot *et al.*, 2008)
- Unrealistic weight loss expectations (Jones *et al.*, 2007)

Aiming for results – an ambivalent experience (Groven *et al.*, 2010)

Stigmatising experiences related to excess weight

- Inclusion criteria: Themes related to stigmatising and negative experiences with others which the participant attributes to their excess weight.
- Exclusion criteria: Themes related to negative experiences and interactions with peers and health professionals in weight management programmes.

Experiences of stigma

- Past experiences of stigmatisation (Visram *et al.*, 2009)
- The gaze of others (Groven *et al.*, 2010)

Stigma hinders weight management

- Prejudice and stigmatization restrict the lifestyle of obese people and hinder treatment (Bidgood *et al.*, 2005)

Stigma motivates weight management

- Negative comments from others as a motivator to dieting (Herriot *et al.*, 2008)

Environmental barriers

- Inclusion criteria: Themes related to participants' perceived environmental barriers to weight management.
- Exclusion criteria: Themes related to perceived sociocultural barriers and perceived barriers posed by the weight management programmes.

Availability of tempting foods

- Tempting foods (Barberia *et al.*, 2008)

Costs

- Costs associated with dieting and exercising (Herriot *et al.*, 2008)
- Cost implications (Jones *et al.*, 2007)
- Costs of weight management services, leisure facilities, health food and transport (Greener *et al.*, 2010)

Safety and security concerns

- Safety and security concerns (Miles *et al.*, 2006)
- Safety concerns (Greener *et al.*, 2010)

Services and facilities

- Appointment availability and flexibility (Jones *et al.*, 2007)

Appendix B: Coding manual for Meta-ethnography

- Other services and resources (Jones *et al.*, 2007)
- Environmental barriers to losing weight (Van Zandvoort *et al.*, 2009)

Environmental facilitators

- Inclusion criteria: Themes related to participants' perceived environmental facilitators to weight management.
 - Exclusion criteria: Themes related to perceived sociocultural facilitators and perceived facilitators established by the weight management programmes.
- Reorganising the environment (Johnson, 1990)

Psychological facilitators

- Inclusion criteria: Themes related to participants' perceived psychological facilitators to the uptake or continuation of weight management.
- Exclusion criteria: Themes related to health as a motivation for weight management, self-perception and body image as a facilitator for weight management.

Making internal changes to facilitate weight management

- Reorganizing the self (Johnson, 1990)
- Meeting one's own needs (Johnson, 1990)
- Relabeling the meaning of success and failure in the context of eating (Johnson, 1990)
- Commitment (Burke *et al.*, 2009)
- Integrating self-monitoring into everyday life (Burke *et al.*, 2009)

Understanding one's eating and dieting patterns

- Uncovering the origins of eating style and dieting (Johnson, 1990)
- Testing: finding the limit to one's food intake (Johnson, 1990)

Psychological barriers

- Inclusion criteria: Themes related to participants' perceived psychological barriers to weight management, including previous unsuccessful weight management attempts.
- Exclusion criteria: Themes related to perceived barriers related to self-perception and body-image and attributions to weight gain and the maintenance of excess weight when the participant was not attempting to manage their weight.

Previous weight loss attempts

- History of weight loss attempts (Fogel *et al.*, 2009)

Appendix B: Coding manual for Meta-ethnography

- Dieting, with or without exercise, has limited success as a treatment for obesity (Bidgood *et al.*, 2005)
- Previous unsuccessful weight loss attempts (Greener *et al.*, 2010)
- Previous weight reduction experiences (Herriot *et al.*, 2008)

Eating for reasons other than satisfying hunger

- Other factors than hunger reported to affect eating habits (Adolfson *et al.*, 2002)
- Emotional eating (Burke *et al.*, 2009)
- Emotions, 'wrong frame of mind', ingrained habits (Herriot *et al.*, 2008)

Feeling unable to manage weight

- Lack of willpower (Barberia *et al.*, 2008)
- Organisational deficiencies (Burke *et al.*, 2009)
- Lack of motivation and willpower (Greener *et al.*, 2010)
- Psychological barriers to losing weight (Van Zandvoort *et al.*, 2009)
- Stress made it more challenging (Miles *et al.*, 2006)
- Slacking off (Burke *et al.*, 2009)
- Feeling inundated (Burke *et al.*, 2009)
- Tedium (Burke *et al.*, 2009)
- Lack of motivation and willpower (Greener *et al.*, 2010)
- Likelihood to 'slip-back' (Cioffi, 2002)
- Inability to self-nurture (Burke *et al.*, 2009)

Appendix C – Recruitment poster, participant information sheet and consent form

Ministry of Defence Research Ethics Committee Reference: 1105/361

Interviews are to take place from 1/2/11-30/3/11



**Calling Royal Navy personnel:
Your help is needed for the development of an
online weight loss programme for Royal Navy
personnel. You can contribute by telling us about
your dietary and physical activity habits.**

You can volunteer if you:

- **Have a BMI of 25 or higher & are concerned about your weight**
 - **Are between 18-55 years of age**
 - **Have an hour to participate in an interview**

If you decide to volunteer for a one-hour interview you will be:

- Asked about your dietary and physical activity habits
- Asked for some optional information (full name, date of birth, marital status, ethnicity, height, weight, waist circumference, rank, medical grade, how long you have served the Royal Navy, how long you have served onboard ships and how long you have lived in service accommodation)
- Making an invaluable contribution to the development of an online weight loss programme for Royal Navy personnel.

Participation in this study is voluntary and you may withdraw at any time.

To arrange an interview please contact **Ms. Gulcan Garip** at
G.Garip@soton.ac.uk or **0794 364 6420**

Information for Participants

Researcher: Gülcan Garip

MoDREC ref no: 1105/361

Study title

Understanding dietary and physical activity habits of Royal Navy personnel who are concerned about their weight: A preliminary investigation to inform further work

Invitation to take part

We would like to invite you to participate in this research project being undertaken by the Institute of Naval Medicine and the University of Southampton, which was tasked by the Department of Naval Physical Development.

You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation 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. If you would like to take part, please let us know if you have been involved in any other study during the last year.

What is the purpose of the research?

This study is being conducted with the intention of understanding your dietary and physical activity habits in the Royal Navy. The information you provide will be used by health professionals at the University of Southampton to inform the development of a web-based weight loss programme for Royal Navy personnel.

Who is doing this research?

I am Gülcan Garip and I am a student on the MPhil/PhD Health Psychology programme at the University of Southampton.

Why have I been invited to take part?

All Royal Navy personnel who have a Body Mass Index (BMI) of at least 25 and are concerned about their weight, and are between the ages of 18-55 are invited to take part in this study. Royal Navy personnel with a BMI less than 25 are not eligible to participate in this study.

Do I have to take part?

No. Participation in the study is voluntary.

What will I be asked to do?

If you decide to take part in an interview, you will be asked about your day-to-day life in the Royal Navy, and your dietary and physical activity habits.

You will be asked to fill out a demographic information sheet which will ask you for your full name, date of birth, gender, marital status, ethnicity, medical grade, rank, height, weight, waist circumference, how long you have served in the Royal Navy, how long you have served onboard ships and how long you have spent in service accommodation. Your full name and rank will be used to ensure that you are not recruited for subsequent studies as it could potentially have a negative impact on the overall results.

The interview will be audio recorded and is expected to last for one hour. No identifiable details will be associated with your interview transcript, which will be linked to your demographic information using a respondent ID code. The interviews will be transcribed by a research administrator from the University of Southampton, who will not be able to identify you. During data analysis, interview transcripts will be securely stored on the primary investigator's computer. You can ask for your recording and transcript to be destroyed at any time by contacting the researcher, Gülcan Garip, at gg1g09@soton.ac.uk. Upon completion of the study, all records will be stored securely in accordance with the Data Protection Act (1998) at the Institute of Naval Medicine and the University of Southampton.

What is the device or procedure that is being tested?

N/A

What are the benefits of taking part?

You may find that talking about your dietary and physical activity habits motivate you to engage in healthy behaviours in the future. Your data will contribute to the development of the web-based weight loss programme for Royal Navy personnel.

What are the possible disadvantages and risks of taking part?

There are no disadvantages to taking part in terms of your Service career, as this will not be affected in any way by your participation or the findings of this research.

Participation in this study will not expose you to any further risks than you would expect to encounter in your daily life. Talking about your diet and physical activity habits is a potentially sensitive topic and you may feel worried about your weight during the interview. If so, the following website may be useful to you:

<http://www.nhs.uk/LiveWell/Loseweight/Pages/Loseweighthome.aspx>

Appendix C: Recruitment poster, participant information and consent form

Alternatively, you could consult your GP to discuss ways to manage your weight.

Can I withdraw from the research and what will happen if I don't want to carry on?

You may at any time withdraw from the experiment without giving a reason. If you ever require any further explanation, please do not hesitate to ask.

Are there any expenses and payments which I will get?

No.

Will my taking part or not taking part affect my Service career?

No. Not in any way.

Whom do I contact if I have any questions or a complaint?

If you have any questions about the research, you can contact the researcher Ms Gülcan Garip, at gg1g09@soton.ac.uk or Dr Bob Bridger, at inm-ems-hhfd@mod.uk or Dr Martina Prude (Head of Research Governance at the University of Southampton), at rgoinfo@soton.ac.uk or the MoDREC secretariat, at ethics.sec@dstl.gov.uk; telephone: 01980 658849.

If you would like to make a complaint about the research please contact Dr Dan Roiz de Sa, at inm-ems-stmcmol@mod.uk.

What happens if I suffer any harm?

In the event of you suffering any adverse effects as a consequence of your participation in this study, you will be eligible to apply for compensation under the MoD's 'No Fault Compensation Scheme' (see separate sheets for details).

What will happen to any samples I give?

N/A.

Will my records be kept confidential?

Any information will remain confidential as to your identity. Other material, which cannot be identified with you, will be published or presented at meetings with the aim of benefiting others. You have a right to obtain copies of all papers, reports, transcripts, summaries and other material so published or presented on request to the Project Officer. All information will be subject to the current conditions of the Data Protection Act 1998.

Experimental records, including paper records and computer files, will be held for a minimum of 100 years in conditions appropriate for the storage of personal information. You have right of access to your records at any time.

Who is organising and funding the research?

The Institute of Naval Medicine is organising and conducting the study, which was tasked by DNPd. The study is also supported by the University of Southampton.

Who has reviewed the study?

A full scientific protocol for this research has been approved by the Ministry of Defence Research Ethics Committee and the University of Southampton School of Psychology Ethics Committee. This study complies and at all times will comply with the Declaration of Helsinki¹ as adopted at the 52nd WMA General Assembly, Edinburgh, October 2000 and with the Additional Protocol to the Convention on Human Rights and Biomedicine, concerning Biomedical Research, (Strasbourg 25.1.2005). Ask the Principal Investigator, Gülcan Garip, if you would like further details of the approval or to see a copy of the full protocol.

Further information and contact details.

The Project Officer is Gülcan Garip. Tel:0794 3646420.
Email:Gg1g09@soton.ac.uk

Compliance with the Declaration of Helsinki.

This research complies with the Declaration of Helsinki.

CONSENT FORM FOR PARTICIPANTS IN RESEARCH STUDIES

¹ World Medical Association (2000) Declaration of Helsinki. Ethical principles for medical research involving human subjects. 52nd World Medical Association General Assembly, Edinburgh, Scotland October 2000.

Appendix C: Recruitment poster, participant information and consent form

Understanding dietary and physical activity habits of Royal Navy personnel who are concerned about their weight: A preliminary investigation to inform further work

Ministry of Defence Research Ethics Committee Reference:

- The nature, aims and risks of the research have been explained to me. I have read and understood the Information for Participants and understand what is expected of me. All my questions have been answered fully to my satisfaction.
- I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and be withdrawn from it immediately without having to give a reason. I also understand that I may be withdrawn from it at any time, and that in neither case will this be held against me in subsequent dealings with the Ministry of Defence.
- I consent to the processing of my personal information for the purposes of this research study. I understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.
- I agree to volunteer as a participant for the study described in the information sheet and give full consent.
- I agree for the interview to be audio recorded.
- I understand that anonymous quotations from this study may be presented or published for research and educational purposes or used in materials given to help people lose weight.
- This consent is specific to the particular study described in the Information for Participants attached and shall not be taken to imply my consent to participate in any subsequent study or deviation from that detailed here.
- I understand that in the event of my sustaining injury, illness or death as a direct result of participating as a volunteer in Ministry of Defence research, I or my dependants may enter a claim with the Ministry of Defence for compensation under the provisions of the no-fault compensation scheme, details of which are attached.

Participant's Statement:

I _____

Appendix C: Recruitment poster, participant information and consent form

agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information for Participants about the project, and understand what the research study involves.

Signed Date

Witness Name

Signature

Investigator's Statement:

I

confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the Participant.

Signed Date

AUTHORISING SIGNATURES

The information supplied above is to the best of my knowledge and belief accurate. I clearly understand my obligations and the rights of research participants, particularly concerning recruitment of participants and obtaining valid consent.

Signature of Chief Investigator

..... **Date**

Name and contact details of Chief Investigator: Gülcan Garip

Tel: 0794 364 6420

Appendix D – Demographic form

Respondent ID Code: _____ (for researcher use)

Understanding dietary and physical activity habits of Royal Navy personnel who are concerned about their weight



Please answer the following questions to help us interpret your data from the interview. Your responses will be kept strictly confidential. Thank you for taking part.

Full name & rank:.....

Date of birth:..../.../...
(dd/mm/yy)

Gender: Male / Female
(circle)

Medical grade:.....
RN:.....

Years served in the
(approximate)

Ethnicity:.....
Divorced

Marital status: Single / Married /
(circle)

Height:..... ft inches **OR** cm

Weight:..... st lbs **OR** kg

Waist circumference:..... inches **OR** cm

Approximate time spent serving onboard ships, if applicable:

Months..... **Years**.....

Approximate time spent living in shore-based Naval accommodation, if applicable:

Months..... **Years**.....

Anything you write on this questionnaire is RESTRICTED MEDICAL and will be stored securely under the Data Protection Act 1998. Only the Principal Investigator, Gulcan Garip, can access this information.

Appendix E: Initial (lower level) codes

Appendix E – Initial (lower level) codes

Feedback and advice based on the expertise of doctors and physical trainers	Medical staff will help with weight management
Family and friends make it difficult to manage weight	Making use of existing facilities and support
Familiarisation with training facilities and opportunities	Making up for missed training
Exercising with others	Making training interesting
Exercising before dinner	Making the first step
Exercises engaged in	Making muscle, burning fat
Excess weight restricting one's ability to train	Limited budget as a rationale for lack of variety and appeal in RN provided food
Eating when hungry	'Letting it slip'
Eating healthy is expensive	Learning about self
Eating healthier because of having trained	Lack of a routine
Ease of access to unhealthy tempting food and drink	Keenness of others to help with weight management
Distinguishing between losing weight and getting fit	Insincere help
Dissatisfaction with excess weight	Information wanted about weight management
Disagreement about ideal weight	Ideas to make website more likely to be used
Difference between what one would like and what one would choose to eat	Ideas for eating healthier
Compulsory or organised time for physical activity	Home environment makes it difficult to train
Common sense advice	Healthy lifestyle is boring
Chances to maintain current weight rather than gain	Healthy food options provided by the RN

Appendix E: Initial (lower level) codes

Catering for self, viewed as healthier than ready-made and RN provided food	Harder to lose weight because of age
Being monitored by others makes one feel self-conscious	Getting into a training routine
Being accountable to someone regarding weight management	Getting in the 'I'm training' mind-set
Becoming an alcoholic or a health freak	Food eaten depends on what the RN provides
Attempts to keep up the training	Finding fault in others
Attempts to eat healthily	Feeling unsupported
Activities one would rather be doing instead of training	Feeling good about training
	Restricted training opportunities
Working it out for yourself	
Work commitments	Restricted diet
Weight management support that doesn't fit in with one's circumstances or needs or preferences	Reasons for wanting to manage weight
Weight loss noticed by others makes one feel good about self	Rationale for unsuccessful weight management
Weight gain on board	Rationale for slow weight loss
Website accessible anytime, anywhere	Rationale for not eating salad
Wants tailored information and feedback	Rationale for eating or drinking unhealthily
Wanting weight management to be habitual	Pushing self to do more in terms of physical activity
Wanting to train because one wants to, not needs to	Previous weight loss experiences
Wanting time for self	Previous dieting experiences
Wanting a weight management plan one can follow	Planning in advance difficult, not a priority
Unable to train because of factors beyond one's control	Planning for training in advance
Training is hard	Overcoming embarrassment
Training as a way of getting away from work	Opportunities to train
Training as a means to pass the fitness test	Not wanting to train

Appendix E: Initial (lower level) codes

Times when temptation can be avoided	Not wanting to pay for weight management
Time restraints	Not noticing weight gained
Supportive home environment	Not eating
Support received for weight management	Not a hungry person
Support is there if one needs it	Not a diet, not a lifestyle change, varied eating patterns
Self-regulation and self-discipline	Not a diet but a lifestyle change
Satisfying cravings without going overboard	No access to unhealthy tempting foods
RN provided food not appealing	Mutual benefit
Restrictions in RN provided accommodation	Monitoring weight management and fitness
Restricted weight management support on board	Monitoring fat loss and muscle gain

Appendix F – Coding manual for understanding Royal Navy personnel’s weight management experiences

1) The naval environment and culture

- a) **Facilities for exercising and support for weight management:** Restricted training opportunities on ships; blaming work commitments for leaving no time to make use of facilities for exercise; restricted support for weight management on ships; not a lot to do on base/ships are included.
- b) **The eating culture:** Food eaten depends on what the RN provides; weight gain onboard; restrictions in self-catered accommodations; RN provided food not appealing; catering for self is healthier than RN-provided food; limited budget as a rationale for lack of variety in RN provided food; not eating food provided by the RN; and, eating and drinking culture promotes becoming an alcoholic or becoming obsessed with health are included.

2) Influence of others

Participants’ direct and indirect experiences with others (including family, friends, physical training instructors, doctors, nurses and divisional officers) to manage their weight are included. This theme excludes instances where *participants blamed others* for their unsuccessful experiences with weight management. References of this nature are included in participants’ **explanation for unsuccessful weight management**. Participants’ references to *managing their weight because they felt accountable to medical staff or physical training instructors* are excluded; they are an example of participants’ external **motivations to manage their weight**. References related to the *eating and drinking culture* among RN personnel as a means to socialise are excluded from this theme; they are an example of participants’ perceptions of **the naval environment and culture**.

- a) **Keeness of others to help with weight management:** Medical staff and/or physical training instructors encouraging participants to join Healthy Lifestyle Clubs and/or to take advantage of the Sports and Recreation Centre’s facilities; where medical staff and/or physical training instructors are described as taking time out of their day to answer participants’ questions; monitoring participants’ weight management progress; pass on information that is relevant to the participant; when medical staff and/or PTIs shared their personal experiences with participants; participants receiving information about what participants could do in order to manage their weight; having tests conducted to measure

Appendix F: Coding manual for understanding weight management in the RN

cholesterol levels to develop tailored weight management information for participants. References of participants who had not had any experience with medical staff and/or physical training instructors for weight management support are excluded, and are related to the code '*support is there, if one needs it*'.

- b) **Comparing self to others:** This code is an example of the indirect influence of others. Not needing to lose weight because there were larger RN personnel; losing weight at a different rate compared to other RN personnel; and exercising with others to compete with them are included.
- c) **Feeling unsupported:** Receiving generic advice; not being able to fit the received exercising programme into one's work schedule; getting insincere feedback from medical staff and/or physical training instructors regarding their weight management efforts; being referred by medical staff and/or physical training instructors to join a weight loss club not provided by the RN are included.

Participants blaming medical staff, physical training instructors, family members and/or other RN personnel for not providing support are examples of **explanations for unsuccessful weight management** and are excluded from this code.

- d) **Support is there, if one needs it:** Perceptions of weight management support in the RN of participants who had no experiences with weight management support in the RN. Knowing physical training instructors and medical staff can be approached for information and help regarding weight management; classes on nutrition organised by physical training instructors; and activities being organised in the gym or on ships for exercising are included.
- e) **Supportive home environment:** Other members of the household restructuring the home environment so that it is supportive of participants' weight management efforts; spouses hiding high calorific foods that are intended for other family members, not buying high calorific foods, switching from drinking alcohol to low calorific drinks whilst watching TV in the evenings with the participant; and not cooking food in excessive amounts are included. Participants themselves restructuring their environment are coded as *no access to unhealthy tempting foods*.
- f) **Weight loss noticed by others makes one feel good about self:** Not noticing one's own weight loss but weight loss is noticed by others; when participants are aware of their weight loss and they receive compliments and/or encouragement from physical training instructors, medical staff, other RN personnel or family and friends are included.

3) Motivations to manage weight

- a) **Internal motivations:** Wanting to get fitter; to look and feel better; improve confidence; out of concern for their health; and to stop sweating are included.
- b) **External motivations:** Wanting to pass the RN fitness test; to be eligible for promotions and attend courses; not to let down friends and family; going exercising as a change from the work routine; to keep their job in the RN; perceiving weight management as compulsory; and to not be embarrassed or self-conscious by not having lost any weight by their next appointment with medical staff or physical training instructors are included.

4) Perceptions of self with regard to excess weight and weight management

Not having issues with excess weight previously; realising that clothes are tighter; realising that one used to look slimmer; eating healthily because of having trained; older age as an explanation for slow weight loss; overcoming embarrassment by familiarising self with gym equipment or engaging in exercises that better suit one's capabilities or not caring what other people at the gym may think; and feeling good about having trained are included.

5) Perceptions of weight management

Not a diet but a lifestyle change; healthy lifestyle is boring; satisfying cravings without going overboard; not knowing what one is doing wrong regarding weight management; intense training constitutes a good work out; training is hard; desire for weight management to be habitual; not wanting to think about weight management behaviours; and wanting to *want* to exercise and not wanting to exercise because one needs to are included.

6) Explanations for successful weight loss

- a) **Getting into a routine:** Reasons why participants were unable to get into a routine are excluded and are coded as 'explanations for unsuccessful weight management'.

Compulsory or organised time to exercise: Organised time to exercise during the working day, either individually or in teams; wanting to be forced to exercise

Appendix F: Coding manual for understanding weight management in the RN

during the working day; adhering to the remedial training package; and wanting Healthy Lifestyle sessions to take place more often are included.

Planning for exercise in advance: Finding it easier to plan when one had a routine; allocating a time to exercise before, during or after work; exercising before or after dinner or during lunchtime, are included. Participants' exercise habits are excluded from this theme and are coded as *attempts to keep up training*.

Self-motivated to exercise: Perceiving exercising as a hobby; engaging in exercising in addition to the remedial training package; and trying different exercises to identify interesting exercises or exercises that suit one's abilities are included. References to engaging in compulsory exercising are excluded as the participant may or may not have been motivated to engage in the exercises.

- b) **Self-regulation and self-discipline:** Being strict with self to overcome the temptation to eat/drink/buy what one wants or to do activities instead of exercising; avoiding temptation by distraction; attempts to eat healthy by catering for self; self-monitoring weight, fitness and/or measuring self; setting goals; working out how to manage weight by oneself; pushing self to do more in terms of exercise; getting in the training mind set; making the first step to exercise; and making up for missed training are included.

7) Explanations for unsuccessful weight management

Barriers to weight management that are not related to the naval environment and culture are included.

- a) **Internal barriers:** Older age; not noticing weight gain; not being able to exercise because of excess weight; and not wanting to exercise/eat smaller portions/give up high calorific foods; do not consider themselves as needing to lose weight; wanting to lose weight but weight loss isn't a priority; wanting time to relax and not worry about weight; lack of knowledge; and discrepancies between wanting to manage weight but would rather be engaging in behaviours incompatible with weight management are included.
- b) **External barriers:** The cost of healthy eating; ease of access of unhealthy food (e.g. English breakfast and chips, daily)/drink; home environment makes it difficult to be motivated to exercise; chores to do at home; disruptions to exercise routine because of holidays or events; believing that one can eat whatever they want after exercising as it will become muscle; not having a

Appendix F: Coding manual for understanding weight management in the RN

routine; not finding a meal plan one can follow; not having enough time in a day to plan for healthy eating or exercising; and family and friends make weight management difficult are included.

Appendix G – Recruitment poster, participant information sheet and consent form

Ministry of Defence Research Ethics Committee Reference: 258/Gen/11

Interviews are to take place from 1/9/11-28/2/12



UNIVERSITY OF
Southampton



**Calling Royal Navy personnel:
Your help is needed for the development of
an online weight loss programme for Royal
Navy personnel. You can contribute by
telling us what you think about the website.**

You can volunteer if you:

- **Have a BMI* of 25 or higher**
- **Are between 18-55 years of age**
- **Have access to a computer and internet
for the next month**

If you decide to volunteer for a one-hour interview you will be:

- Asked to use the website and provide feedback in an interview
- Asked to use the website in your own time for a month and then provide feedback in a telephone interview
- Asked for some optional information (full name, date of birth, marital status, ethnicity, height, weight, waist circumference, rank, medical grade, how long you have served the Royal Navy, how long you have served onboard ships and how long you have lived in service accommodation, telephone no)
- Making an invaluable contribution to the development of an online weight loss programme for Royal Navy personnel.

Participation in this study is entirely voluntary and you may withdraw at any time.

*Online BMI calculator: <http://www.nhs.uk/Tools/Pages/Healthyweightcalculator.aspx>

To arrange an interview please contact **Ms. Gulcan Garip at
Gg1g09@soton.ac.uk or 0794 364 6420**

Information for Participants

Researcher: Gülcan Garip
MoDREC ref no: 258/Gen/11

Study title

Royal Navy ratings' views on a web-based weight loss programme: A pilot qualitative study to inform further work

Invitation to take part

You are invited to participate in this research project developed by the Institute of Naval Medicine and the University of Southampton, which was tasked by the Department of Naval Physical Development.

You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve.

Please take time to read the following information carefully and discuss it with others if you wish. Feel free to ask the researcher if there is anything that is not clear or if you would like more information. If you would like to take part, please let us know if you have been involved in any other study during the last year.

What is the purpose of the research?

This study is being conducted with the intention of understanding your experiences and views of using a weight loss website that is being designed for overweight and obese Royal Navy personnel. The information you provide will be used by health professionals at the University of Southampton to improve the weight loss website.

Who is doing this research?

The researcher is Gülcan Garip, a trainee health psychologist on the MPhil/PhD Health Psychology programme at the University of Southampton.

Why have I been invited to take part?

All Royal Navy personnel between the ages of 18-55 who are fit for Naval Service and have a Body Mass Index (BMI) of at least 25 and are concerned about their weight are eligible to take part in this study.

Do I have to take part?

No, participation in the study is entirely voluntary.

What will I be asked to do?

Information about the website

This is a weight loss website that is currently being developed for RN personnel. The information and tools used in the website are based on the most recent scientific evidence. The website consists of 12 sessions and each session will take about 15-20 minutes to complete, except for the first session which may take about 30 minutes.

Appendix G: Recruitment poster, participant information and consent form

If you are willing to participate in a second interview, you will participate in another interview while using a different session of the website.

What will I be asked to do if I decide to take part in this study?

- 1. You will be asked to participate in an interview while using the first session of the website. The researcher will ask you for your thoughts and feelings as you are using the website. You will be asked to fill out a demographic information sheet which will ask you for your full name, date of birth, gender, marital status, ethnicity, medical grade, rank, height, weight, waist circumference, how long you have served in the Royal Navy, how long you have served onboard ships and how long you have spent in service accommodation. Your full name and rank will be used to ensure that you are not recruited for subsequent studies in this project as it could potentially have a negative impact on the overall results. You will be compensated 10GBP for your time.**
- 2. You have the opportunity to participate in a second interview using a different session of the website. If you are willing to participate in a second interview, you will be compensated a further 10GBP for your time.**
- 3. You will be asked to use the website in your own time, aiming to complete at least 3 sessions each week.**
- 4. You will be encouraged to use a hand-out (given to you by the interviewer) to make notes on aspects that you like/dislike, things that you would/would not like to see, etc. about remaining sessions.**
- 5. You will arrange a time and date for a telephone interview with the researcher. In this telephone interview you will be asked to inform the researcher about your experience with using the website. The notes you will have made on the hand-out will be invaluable for improving the website's content and usability. You will receive a further 5GBP for your time.**

The interviews will be audio recorded and are expected to last for one hour. The telephone interviews are expected to last for half an hour.

Your data will be linked to your demographic information using a respondent ID code which will only be known by the researcher, Gülcan Garip. The interviews will be transcribed by a research administrator from the University of Southampton, who will not be able to identify you. During data analysis, interview transcripts will be securely stored on the researcher's computer. You can ask for your recording and transcript to be destroyed at any time by contacting the researcher, Gülcan Garip, at gg1g09@soton.ac.uk.

Upon completion of the study, all records will be stored securely in accordance with the Data Protection Act (1998) at the Institute of Naval Medicine and the University of Southampton.

What is the device or procedure that is being tested?

A weight loss website.

What are the benefits of taking part?

Appendix G: Recruitment poster, participant information and consent form

The website aims to give you tools and advice as to how to establish long-term behaviours associated with managing your weight. Your feedback will contribute to improving the content and usability of the weight loss website for Royal Navy personnel.

What are the possible disadvantages and risks of taking part?

There are no disadvantages to taking part in terms of your Service career, as this will not be affected in any way by your participation or the findings of this research.

Participation in this study will not expose you to any further risks than you would expect to encounter in your daily life. You may become distressed or frustrated as a result of not being able to achieve the goals you set using the website and you may feel worried about your weight. If so, you could consult your GP or physical training instructor to discuss ways to manage your weight.

Can I withdraw from the research and what will happen if I don't want to carry on?

You may at any time withdraw from the experiment without giving a reason. If you ever require any further explanation, please do not hesitate to ask.

Are there any expenses and payments which I will get?

You will receive 15GBP for participating in one face to face interview and one telephone interview, or you will receive 25GBP for participating in two face to face and one telephone interviews. You will be reimbursed for any travel expenses incurred.

Will my taking part or not taking part affect my Service career?

No, not in any way.

Whom do I contact if I have any questions or a complaint?

If you have any questions about the research, you can contact the researcher Ms Gülcan Garip, at gg1g09@soton.ac.uk or Dr Bob Bridger, at inm-ems-hhfd@mod.uk or Dr Martina Prude (Head of Research Governance at the University of Southampton), at rgoinfo@soton.ac.uk or the MoDREC secretariat, at ethics.sec@dstl.gov.uk; telephone: 01980 658849.

If you would like to make a complaint about the research please contact Dr Dan Roiz de Sa, at inm-ems-stmcmo1@mod.uk.

What happens if I suffer any harm?

In the event of you suffering any adverse effects as a consequence of your participation in this study, you will be eligible to apply for compensation under the MoD's 'No Fault Compensation Scheme' (see separate sheets for details).

Will my records be kept confidential?

Any information will remain confidential as to your identity. Other material, which cannot be identified with you, will be published or presented at meetings with the aim of benefiting others. You have a right to obtain copies of all papers, reports, transcripts, summaries and other material so published or presented on request to the Project Officer. All information will be subject to the current conditions of the Data Protection Act 1998.

Experimental records, including paper records and computer files, will be held for a

Appendix G: Recruitment poster, participant information and consent form

minimum of 100 years in conditions appropriate for the storage of personal information. You have right of access to your records at any time.

Who is organising and funding the research?

The Institute of Naval Medicine is organising and conducting the study, which was tasked by DNPd. The study is also supported by the University of Southampton.

Who has reviewed the study?

A full scientific protocol for this research has been approved by the Ministry of Defence Research Ethics Committee and the University of Southampton School of Psychology Ethics Committee. This study complies and at all times will comply with the Declaration of Helsinki² as adopted at the 52nd WMA General Assembly, Edinburgh, October 2000 and with the Additional Protocol to the Convention on Human Rights and Biomedicine, concerning Biomedical Research, (Strasbourg 25.1.2005). Ask the Principal Investigator, Gülcan Garip, if you would like further details of the approval or to see a copy of the full protocol.

Further information and contact details.

The Project Officer is Gülcan Garip. Tel:0794 3646420. Email:Gg1g09@soton.ac.uk

Compliance with the Declaration of Helsinki.

This research complies with the Declaration of Helsinki.

CONSENT FORM FOR PARTICIPANTS IN RESEARCH STUDIES

Royal Navy ratings' views on a web-based weight loss programme: A pilot qualitative study to inform further work

² World Medical Association (2000) Declaration of Helsinki. Ethical principles for medical research involving human subjects. 52nd World Medical Association General Assembly, Edinburgh, Scotland October 2000.

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Ministry of Defence Research Ethics Committee Reference: 258/Gen/11

- The nature, aims and risks of the research have been explained to me. I have read and understood the Information for Participants and understand what is expected of me. All my questions have been answered fully to my satisfaction.
- I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and be withdrawn from it immediately without having to give a reason. I also understand that I may be withdrawn from it at any time, and that in neither case will this be held against me in subsequent dealings with the Ministry of Defence.
- I consent to the processing of my personal information for the purposes of this research study. I understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.
- I agree to volunteer as a participant for the study described in the information sheet and give full consent.
- I agree for the interview to be audio recorded.
- I understand that anonymous quotations from this study may be presented or published for research and educational purposes or used in materials given to help people lose weight.
- This consent is specific to the particular study described in the Information for Participants attached and shall not be taken to imply my consent to participate in any subsequent study or deviation from that detailed here.
- I understand that in the event of my sustaining injury, illness or death as a direct result of participating as a volunteer in Ministry of Defence research, I or my dependants may enter a claim with the Ministry of Defence for compensation under the provisions of the no-fault compensation scheme, details of which are attached.

Participant's Statement:

**I _____
agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information for Participants about the project, and understand what the research study involves.**

Appendix G: Recruitment poster, participant information and consent form

Signed **Date**

Witness Name

Signature

Investigator's Statement:

I _____
confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the Participant.

Signed **Date**

AUTHORISING SIGNATURES

The information supplied above is to the best of my knowledge and belief accurate. I clearly understand my obligations and the rights of research participants, particularly concerning recruitment of participants and obtaining valid consent.

Signature of Chief Investigator

..... **Date**

**Name and contact details of Chief Investigator: Gülcan Garip
Tel: 0794 364 6420**

Appendix H – Hand-outs for participants to complete whilst using the POWeR programme in their own time

Thinking about POWeR

Thank you for volunteering to look over the POWeR sessions.

Here are some questions to help you to think about the intervention.

Please write in as much detail as you would like and use a **separate sheet for each session**. You can use this hand-out as to make notes about your experiences while using the website. You will be able to give feedback based on your notes to the interviewer, who will call you in 4 weeks to find out how you got on with the website. *The hand-out and your separate sheets for each session will not be collected.*

Session name:

Please use the space below to write about any thoughts that you have about the POWeR session as you use the site.

What were your thoughts on the information that you received in this session?

How did you feel about the different POWeR tools and activities?

Appendix H: Participant hand-outs whilst using POWeR

Please tell us about any aspects that you didn't like in the session. What was it about these things that you did not like?

Do you have any suggestions for improving the POWeR session?

Please tell us about any parts of the session that you would recommend to other people. What was it about these parts that you liked?

Did you experience any problems or difficulties when you using the website?

Appendix I: Demographic form

Appendix I – Demographic form

Respondent ID Code: _____(for researcher use)

Please answer the following questions to help us interpret your data from the interview. Your responses will be kept strictly confidential. Thank you for taking part.

Full name and rank:.....

Date of birth:..../.../...
(dd/mm/yy)

Gender: Male / Female
(circle)

Medical grade:.....

Years served in the RN:.....
(approximate)

Ethnicity:.....

Marital status: Single / Married / Divorced
(circle)

Height:..... ft inches **OR** cm

Weight:..... st lbs **OR** kg

Waist circumference:..... inches **OR** cm

Approximate time spent serving onboard ships, if applicable:

Months..... **Years**.....

Approximate time spent living in shore-based Naval accommodation, if applicable:

Months..... **Years**.....

Anything you write on this questionnaire is RESTRICTED MEDICAL and will be stored securely under the Data Protection Act 1998. Only the Principal Investigator, Gulcan Garip, can access this information.

Appendix J – Coding manual for think aloud and telephone interviews related to the web-based weight loss intervention with Royal Navy personnel

This coding manual consists of 9 major themes. Five of the major themes have sub-themes. The inclusion and exclusion criteria for each major and sub-theme are described.

- Perceptions of weight and weight management
 - o Perceptions of weight
 - o Perceptions of weight management
- Perceptions of and experiences with structured diets
- Reasons for engaging in exercise, increasing physical activity, and eating healthier
- Barriers to losing weight
 - o Environmental factors
 - o Psychological factors
 - o Behavioural factors
- Involvement of others in one's weight loss attempt
 - o Types of involvement of other's in one's weight loss attempt
 - o Attitudes towards the involvement of others
- Perceptions of using the website and its content
 - o Perceptions of the design, usability and usefulness of the website
 - o Trustworthy versus scepticism
 - o Perceptions of website features and content
- Technical issues with using the website
- Informing website modifications
 - o Improving visual appeal, structure and reducing the length of the website
 - o Improving information provided and increasing amount of feedback
- Reasons for not engaging with the website

Perceptions of weight and weight management

This theme includes beliefs about one's weight and size, and what is involved in managing one's weight.

Perceptions of weight

Perceptions of weight may include references to being big; not being able to lose weight; talking about being fat or trying to lose weight in a humorous way; weight being related to what one eats; enjoying the food one eats; taking part in the study because of one's weight.

Perceptions of weight management

Perceptions of weight management may include references to the importance of education for knowing what is right or wrong when trying to manage weight; the need to keep weight management behaviours interesting and enjoyable; weight management being dependent on one's commitment; the belief that under eating is bad; the belief that people eat with their eyes; making sure telly is off whilst eating; need to read food labels, but one tends not to; keeping the food list visible; changing up one's exercise routine; the need to find ways to keep training interesting; changing training plans around; finding ways to exercise without feeling tired; changing up training so body doesn't get used to it; focusing on starting out at doing physical activity; things one is prepared/not prepared to do for weight loss; not needing to lose weight for increasing confidence; reliance on the website rather than personal responsibility for weight loss.

Beliefs about perceived barriers to weight management are excluded from this theme and are included in the theme *barriers to losing weight*.

Perceptions of and experiences with structured diets

This theme includes instances related to previous experiences with and, positive and negative perceptions of structured diets. References to following a structured diet; focusing on calorie count; dissatisfaction with calorie counting; giving up calorie counting diets; scared to eat when calorie counting; not knowing how many calories in certain foods; the inability to control every single calorie; leaving food in the plate perceived as wasteful; using calorie counting as a basis but not as a strict guide; not needing to calorie count if you know what's good or bad for you; awareness of calories; being self-conscious of what one eats; surprised about the calories in foods originally considered as healthy, are included.

Reasons for engaging in exercise, increasing physical activity, and eating healthier

Appendix J: Coding manual for think aloud and telephone interviews

This theme relates to participants' reasons for engaging in behaviours for managing one's weight (i.e. exercising, increasing physical activity, and eating healthier). Examples include, engaging in behaviours for the enjoyment of it; liking the idea of trying to keep fit; not being able to play rugby currently but wanting to be able to play; makes one feel better; to pass the compulsory fitness test.

Barriers to losing weight

This theme relates to environmental, psychological and behavioural factors participants perceive as hindering their efforts to lose weight.

Environmental factors

This may include life events that get in the way of managing weight; tempting food is there; unhealthy food being in your face; considerations for one's budget; planning healthy meals that one can look forward to perceived as costly; lack of options as to what one can eat in the RN.

Psychological factors

This may include beliefs about BMI not perceived as an accurate measure; one's genetic make-up; discrepancy between BMI one should be at and what is achievable in reality; not focusing on current weight; not knowing what the right thing to do is for weight loss; I've been overweight for this long, it can't be that bad; not wanting to know how much one weighs; need for a getaway; need for time to relax; not willing to give up food that one likes.

Behavioural factors

This may include references to snacking before an evening meal.

References to other people hindering weight loss are coded under *attitudes towards the involvement of other's*.

Involvement of others in one's weight loss attempt

Types of involvement of others in one's weight loss attempt

This theme relates to the ways health professionals, family and friends, and physical training instructors were reported as being involved in one's attempts to lose weight. This may include being told what to eat; seeing a nurse for weight loss; people using scare/shock tactics to change one's behaviour; being guided by partner's experience of Slimming World; talking to a health visitor about portion control; information about

Appendix J: Coding manual for think aloud and telephone interviews

healthy eating covered by physical training instructor while attending the healthy lifestyle club; weight progress monitored by physical training instructor while attending the healthy lifestyle club; making an eating plan with partner, helping each other out.

Attitudes towards the involvement of others

This theme includes instances relating to the participant feeling accountable to, and positive and negative attitudes towards the involvement of health professionals, family and friends, and physical training instructors in one's attempts to lose weight. This may include dislike about being told how to lose weight; good to have someone focus on what you've achieved rather than where you have gone wrong; doing something because somebody says you've got to do it; some info presented by physical training instructors perceived as too advanced and/or irrelevant; concerned about what others will say about food diary; didn't use support groups when I was quitting smoking; people work against you or with you.

Perceptions of using the website and its content

Perceptions of the design, usability and usefulness of the website

This theme includes references to how participants perceived the appearance of the website, the extent to which the website was found to be useful or not, based on references to recommending the website to others or by participants taking on board advice from the website. This may include references to the website being perceived as simple and organised; plain; free of advertisements; easy to use; self-explanatory; behavioural changes made as a result of using POWeR, e.g. not cooking more than needed; useful if you don't know how to get fit; good tool to be used in tandem with medical and fitness personnel; programme gives a bit of support and a bit of control; not a controlling diet; would recommend it to people just starting out, who are clueless about weight loss; website does what it says on the tin; similarities between sessions; information-wise nothing new; recommending the website or information from the website to others; passing on the link to partner; would recommend website to peers and people one is in charge of; website differs from what is previously known; session 4 was a waste, similar to session 3; advice in sessions seen as repetitive; repetitive information being presented.

Trustworthy versus scepticism

This theme includes references to suggest that participants perceived the website as trustworthy or were sceptical about the information presented. This may include inquiries about whether medical staff was involved in the study; inquiries about whether anyone is monitoring the website; seeking information about whether professionals are involved in the website; contradictory information to what was previously known; need

Appendix J: Coding manual for think aloud and telephone interviews

for scientific evidence; making it clearer that the answers to questions in the website have been given by experts in the field;

Technical issues with using the website

This theme includes references to technical issues, such as, connectivity to the internet, accessing the website, and comparing the websites features to paper-based alternatives. This may include references to slow internet connections from base; accessing the website from work computer; postponing access to the website so that it can be accessed from home rather than work; using the website in the evenings or at weekends; problems logging in through the link provided in the automatic emails; food diary on computer better than filling it in on paper.

Perceptions of website features and content

This theme includes references to participants' perceptions of the features in the website, including views of others' experiences, external links, email reminders, the goal setting and planning tools, the food diary, and the eating plan. This may include instances such as others' experiences not being relevant; others' experiences keep it interesting; looking at what others have done to change up one's own routine; generic goals set by others disliked; wondering *how* others lost weight; nice to see what others have done; sharing ideas perceived as helpful; confirming what is already known; learning new information; surprised about information; common-sense information, information that everyone knows; information that you wouldn't want to ask; external links liked; reminders liked; daily reminders helped give that little bit of oomph; goal setting wouldn't work; does not want to set goals; not planning has worked; not possible to plan for every day; goals are set to be achieved; setting goals one is already achieving or likely to achieve without much effort; getting upset about not reaching one's goal; already achieving goals suggested in the website; planning is good if one is prepared; sounds easy when you write it down but in practice can get problematic; setting and achieving goals builds confidence; experience with using SMART goals; deciding on a meal plan is difficult; desire to mix and match eating plans; dislike any diet that says you can't have something; anticipating difficulties with following a low carb plan; side effects of low carb plan may interfere with daily tasks; focus on meat, liked; choosing a meal plan a lengthy process, too much to read; desire to know what can be eaten.

Informing website modifications

This theme includes participants' suggestions for modifying the website to improve the websites visual appeal and ensure that the content better meets users' needs.

Improving visual appeal, structure and reducing the length of the website

Appendix J: Coding manual for think aloud and telephone interviews

This may include references to having visual images of portions in website; adding exciting pictures; adding in pictures of people exercising in the RN; having the RN logos on every page; using RN colours in the website to make it more part of the RN; making website shorter - if it can be said in one sentence, say it in one sentence; session 1 starting from goal setting; having reasons to lose weight card at the start of session 1; record weight at the start of session 1; option to complete food diary daily; food diary embedded in a calendar; adding a reflection section with the planning tool; adding a box for writing reasons for not achieving goals; having motivational emails sent later on in the week; monitoring physical activity every day; instead of text, would prefer motivational pictures;

Improving information provided and increasing amount of feedback

This may include information about different types of weight loss drugs; more statistical information to back up scientific evidence; giving feedback to people on the foods they add to the diary; giving information about where to buy cheap fruit and vegetables from local supermarkets; links to healthy menus; giving more information about how long it took the people whose stories are reported about losing weight using POWeR; ongoing daily advice wanted; more emphasis on physical activity; goals are too flowery, wanting to be told what to do; wants a fat-losing website rather than a weight loss website; website needs something extra to pull in the general everyday forces guy.

Reasons for not engaging with the website

This theme includes participants' explanations for not engaging with the website. This may include references to becoming lazy; giving up; would've used it if I was paying; busy with work; if you want to make people use it, make it compulsory; waiting for a time when one isn't busy to use the website; started following a different diet for building muscle – POWeR not perceived as being useful for this purpose as it is a weight loss website; physical injury led to discontinuing using the website; to be honest, I haven't done anything; not had a chance; unable to sign in to continue using POWeR; website hasn't worked for me; initial enthusiasm (implies enthusiasm disappeared after a while); hard to fit in website sessions with work; doing it on my own didn't work out for me; using humour to talk about failing at goals; reasons to lose weight card made me roll my eyes – I know why I need to lose weight.

Appendix K – MoSCoW list for informing modification to the POWeR intervention

MOSCOW list

Note: Phrases written in quotation marks are inductive codes from the interviews

The POWeR intervention already satisfies the following:

- Tools and techniques that aim to help RN personnel “work [weight management] out for themselves”
- “Tailored information and feedback”
- “Not a diet but a lifestyle change” “Wanting weight management to be habitual” – POWeR explains that over time, goal behaviours will become habitual
- “Wanting a weight management plan that can be followed” – POWeR explains why this is not going to be provided. Could emphasise the importance of “working it out for yourself”, ensuring that the user will do things that will work for them
- Acknowledgement that “weight management is difficult”
- “Not wanting to pay for weight management”
- “Dislike common sense advice” - POWeR will show people techniques for setting goals and engaging in behaviours that should lead to weight loss.
- “Monitoring weight management and fitness”
- Examples of people making attempts to eat healthily – already in POWeR but not from people in the Navy

Must haves

- POWeR welcome page – to explain that POWeR is a fitness and weight management programme has been adapted for RN personnel (who are overweight or obese – *probably best to leave this bit out but wanted to make sure that the target users are made clear*).
- Getting Support page – adding to the list facilities and sources of support: physical training instructors, Healthy Lifestyle Club sessions, the gym, outdoor facilities
 - Confirming with the chosen base that nurse support will be available for users. Raising awareness of the support that is available in the RN for weight management – (example stories of the approachability of PTI staff and nurses) “medical staff will help with weight management” getting people to approach medical staff and getting medical staff to be involved with the users during the use of POWeR. “keenness of others to help with weight management”
- Need to distinguish between “training” and “physical activity” and encourage users to identify opportunities to increase physical activity on a daily basis, and not just focus on arranging time for “training”. Need to remove the focus from barriers to arranging training on a daily basis.
- Adding a page of a list of physical activity RN personnel engage in; “opportunities to train”
- Adding quotes from the interviews to serve as examples for:

Appendix K: MoSCoW list for informing intervention modifications

- “making the first step” as the hardest part to getting involved in physical activity. Can be linked in with “not wanting to train” and “self-discipline/self-regulation”
- acknowledgement of times when people will “let it slip”; “unable to train because of factors beyond one’s control” “home environment, family and friends make it difficult to train”
- noting the importance of “making up for missed training” and linking this back to “working it out for yourself”
- emphasise importance of “working it out for yourself”
- making the most of spare time during working hours to train (“training as a means to get away from work”), either alone or with others (“exercising with others”)
- acknowledge that there will be times when people do not want to train (“not wanting to train” “activities one would rather be doing instead of training” “wants time for self”) and provide examples of “self-discipline/self-regulation” “planning in advance” “attempts to keep up training” and “working it out for yourself” – add quote explaining that by having planned for training in advance, once the training is completed, the person has time for themselves later on in the day
- Acknowledgement of “work commitments” [prompt users to think about their busy schedules and their changing routines and suggest to them that they identify how and when they would incorporate their goals within their busy schedules – importance of working it out for yourself can be emphasised here again]
- “Difference between what one would like to eat and what one chooses to eat”
- For people who are limited to RN provided food – give examples of reducing portion sizes or reducing carb intake and suggesting that people could help themselves to salad with their hot meal. Going for the porridge or cereal for breakfast instead of the English breakfast. Swapping chocolate/crisps with fruit (available in the galley) – linking this with “self-discipline and self-management” – provide example goals in POWeR
 - Would it be appropriate to have an example goal along the lines of, once a week I will get an English breakfast but I won’t eat chips and toast?
- Add reasons for wanting to lose weight to the motivation card
 - dissatisfaction with excess weight; to feel better about self; to be fitter; to not sweat as much; gain confidence; health concerns; wanting to look better; stay in the RN – to not lose job; not wanting to let mates/family down; for promotions; it will get harder as one gets older; **[COPY this into RESULTS write up]**
- Change name of *reasons to lose weight* card to *reasons to keep fit*
- “Distinguishing between losing weight and getting fit” – when talking about exercising or training, maybe better to keep the focus on getting fit, maybe we could always talk about getting fit and that losing weight is part of getting fit
- Add a myths buster page which addresses people’s misconceptions about behaviours they do that they think are helpful to weight management
 - Not eating breakfast or lunch
 - The “golden hour after training” - you can eat what you want and it will become muscle
 - Drinking energy drinks for concentration during lectures

Appendix K: MoSCoW list for informing intervention modifications

- Being accountable to someone regarding weight management – gives people something to look forward to but this is bad because it makes people rely on someone else. Need to turn this motivation inwards – this is like an extrinsic motivation that could be useful initially but would need to be transferred over to the individual by explaining to the person that by monitoring their own weight, they still have something to look forward to and they can see their achievements or where they need to make modifications to their behaviours if they are gaining weight.
- Acknowledge “ease of access to unhealthy tempting food and drink” and “eating healthily is expensive” – focus on trying to adopt eating patterns that will help the user get fitter and in getting fitter they are also losing weight
- Is it better to eat when hungry or it is better to eat at scheduled times – what’s the best way to go about eating in an ideal world. As a rationale for not eating in the mornings because then they can go for ages without eating. But if they eat in the morning then they feel hungry all day.
- Highlighting the need for finding exercises that suit one’s level because with excess weight it may be difficult to engage in intense exercises.
- Examples of how others got in the “training mind set” and got into a “training routine”. Quotes from people about “feeling good about having trained”.
- “Distinguishing between making muscle, burning fat” when talking about the benefits of exercising regularly. For the majority of RN personnel interviewed, making muscle was their priority rather than burning fat.
- Inductive codes derived from the interviews that map on to the factors from the meta-ethnography:
 - Experiences with the intervention – RN personnel’s experience with the website may be influenced by their previous experiences with other weight management support received in and out of the RN. One participant talked about feeling ignored or felt held back by a PTI who had promised to put together a personal training programme for the participant but had not done this for them. And as a result the participant explained how they were not able to get into a training habit. When support is available, it needs to be made clear to individuals what the division of responsibility is going to be. In the Naval environment RN personnel are accountable to a higher ranking person, which they see as the person in charge. As a result, people may have a tendency to rely on others to tell them exactly what they need to do and how they should achieve such behaviours, eliminating their responsibility in the process of weight management
 - Positive outcomes of programme participation – Once people start using POWeR and they stick to their goals, people should lose weight.
 - Sociocultural factors – the culture in the RN towards eating/drinking may be incompatible with healthy lifestyle behaviours. Should this be acknowledged in the welcome page of POWeR?
 - Attributions for weight gain – some people had misconceptions as to why they were unable to lose weight while others were aware of the behaviours they needed to change in order to lose weight.

Appendix K: MoSCoW list for informing intervention modifications

-Self-perception and body image – Mainly female participants talked about the influence of excess weight on their self-perception. For some, improving body image was a motivation to want to lose weight. But because of their negative self-perception, they were put off by going to the gym at times when lots of fit people were working out. Should this be acknowledged in POWeR only for females?

-Stigmatising experiences – People did not talk about such experiences however this may be because this wasn't specifically asked to participants. Participants did talk about times when they felt the support they got for weight management from medical officers and from personal training instructors was not helpful to their circumstances.

-Health concerns – Few participants talked about their concern for their health due to excess weight and one participant stated that they were more concerned about their weight because of the possibility of losing their job in the RN rather than their health. This suggests that for this particular participant, more immediate repercussions of excess weight had more of an impact on their decision to manage weight.

-Expectations towards weight management – participants didn't talk about expectations towards weight management, whether rational or irrational but this may be because it was not specifically asked in the interviews. Participants did have some things to say about why their weight loss was going slow or what they were doing in order to speed up the weight management process.

-Environmental factors – There were many barriers reported by participants with regards to environmental factors that made weight management difficult. These included "ease of access to unhealthy foods" in Naval bases and vessels; lack of "organised time for physical activity";

Participants talked about the potential benefit that they could gain from "organised time for physical activity". While few participants stated that compulsory physical activity/training/exercising sessions took away the enjoyment of exercising, other participants felt that "compulsory and organised training" would ensure that RN personnel were able to engage in some amount of physical activity on a weekly basis. [However, this raises the issue of where the responsibility lies for people's weight management- people talk about not having enough time in the day to exercise and talk about how that once work hours are over, they want time to themselves. This suggests weight management, or training, more specifically, is seen as something that the Navy should provide time for and should be addressed during the working day. Among younger RN personnel, this may be because of their lack of experience with exercising or making time for physical activity prior to joining the RN. It may be that, in their view, it is the RN's responsibility to allow for time for personnel to engage in physical activity and once working hours are over, the personnel should be allowed to unwind, relax or engage in behaviours that they *want* to do.] Getting people to think about ways in which they can alter their environment so one isn't tempted: making unhealthy foods inaccessible (not buying them)

-Psychological factors – Participants talked about "getting into the right mind-set" "getting into a routine" for managing their weight. People who had established these routines talked about how it facilitates weight management, while those who

Appendix K: MoSCoW list for informing intervention modifications

struggled with weight management mentioned “lack of a routine” as a barrier to weight management. Some participants said they desired to train because they actually wanted to train and not because they needed to train.

Should haves

- Examples of quotes:
 - “eating healthier because of having trained” – an example of the benefits of training
 - Acknowledgement of “weight gain on board” and maybe mentioning how at the moment it wasn’t possible for the website to be made accessible on ships but that once these goal behaviours become habits, they are likely to transfer to when users are at sea also
 - Overcoming embarrassment stories of going to the gym or seeking help
- Giving people ideas for when they may be able to access the website (from their phones, at home, in their cabins,)
- Acknowledging that training will be easier if the person is able to find an activity that one enjoys doing as opposed to is required to do (e.g. to pass the RNFT; the remedial training package) – a list of activities can be given which include the different types of activities people in the RN engage in
- Informing people who will be supporting the users that they should try to acknowledge weight loss if they observe it in the users as this makes them feel good
- Getting people to reflect on the times when they are likely to be tempted, what the setting is like, what their mood is like, and thinking about ways that this can be avoided
- Acknowledge that weight gain may have happened slowly and not noticed – not currently in POWeR
- Highlighting the mutual gains between the person losing weight and the PTI or nurses supporting the person to lose weight. Also mutual gains between the individual and for the RN since people will not be made redundant or days won’t be lost from sickness because people are more likely to develop injuries due to excess weight.
- Acknowledging limitations in the RN:
 - “Limited budget as a rationale the lack of variety and appeal in RN provided food” – this can only be accepted and also this is true for other restrictions in the RN. So the restrictions need to be made aware and accepted and the person needs to find ways within these restrictions to be able to manage their weight, in ways which “work for them”.
- Some people talked about learning about themselves whilst trying to manage their weight. Not included in POWeR at the moment that the user may learn things about themselves while trying some of the suggestions in this website. People may learn about what they like/dislike, when they are likely to be tempted/ when they can avoid temptation, etc. raising awareness of this and that finding the best way that works for the individual may be a trial and error process and that there isn’t a specific package or plan that would work for them. And in fact, one set of plans that they establish for weight management may not work in a different environment. For instance, may need to add something to POWeR that highlights the need to come up with plans for when people are in different situations. (1) working in the navy (2) living in the navy (3) catering for self in the navy (4) eating in the galley (5) living at home (6)

Appendix K: MoSCoW list for informing intervention modifications

going over to friends and family (7) being on holiday (8) being on a ship at sea – may be useful to come up with a list of the different settings that participants talked about and list these for others to see and think about what they can do in order to be able to manage weight in these circumstances.

- “Lack of a routine” may be useful to get people to think about their division, or their duties, their roles and for them to come up with different plans for what they could do in order to engage in weight management behaviours or how/when they would be able to make up for the times if they slip or expect that there is a chance that they might slip.
- There is an impression among RN personnel that RN personnel gain weight on ships, and so that their goal ought to be to try and maintain their weight. Or if they are overweight/obese to begin with, they should again, aim to try and maintain their weight.

Could have

- Acknowledging that in the past, some people may have received weight management support that they didn't feel was sincere or that didn't fit their circumstances, needs or preferences and this could be linked in with the importance of working it out for yourself
- For people who live on board bases or are on ships, RN personnel have this impression that people either become health freaks or they become alcoholics – maybe in the myth buster page this could be addressed.

Links that could be added to intervention:

- <http://www.royalnavy.mod.uk/operations-and-support/establishments/training-establishments/hms-raleigh/rn-recruit-school/before-you-join/nutrition/index.htm>
- <http://www.royalnavy.mod.uk/operations-and-support/establishments/training-establishments/hms-raleigh/rn-recruit-school/before-you-join/fitness/fitness-programme/index.htm>
- <http://www.royalnavy.mod.uk/operations-and-support/establishments/training-establishments/hms-raleigh/rn-recruit-school/before-you-join/fitness/fitness-standards/index.htm>

Would have

- In addition to measuring weight, allow users to monitor progress of their body fat to “monitor fat loss and muscle gain”

Themes that do not map onto the modifications to the website:

- “Disagreement about ideal weight” - this is related to mismatch between support received for weight management
- “Blaming others for unsuccessful weight management”

Appendix L – Feasibility study folder for physical training instructors



MoDREC Reference Number: 330/GEN/12

Contents

Tasking information

Presentation slides

Information on:

- Recruitment
- Eligibility
- Measurement
- Support

Study timeline

Participant information sheet

Study IDs for participants

Guidelines and session content checklist

Contact Details

If you have any questions regarding this study, please contact the researcher:

Ms Gülcan Garip

Office: 02380 592581

Mobile: 0794 3646420

Email: G.Garip@soton.ac.uk

Thank you!

Thank you very much for your involvement in the POWeR study. Physical training instructors are already involved in supporting overweight and obese RN personnel manage their weight. This study is aiming to find out whether the POWeR website could be used as an additional tool alongside the work carried out by physical training instructors in supporting overweight and obese RN personnel lose weight and maintain a healthier weight in the long-term.

TASKING INFORMATION

The Department of Naval Physical Development has tasked the Institute of Naval Medicine to collaborate with the University of Southampton to adapt an existing weight loss website for the Royal Navy. The project comprises of three studies, two of which have been completed.

This information pack is related to Study 3.

Study 1: An interview study to understand the dietary and physical activity behaviours of overweight and obese RN ratings to inform modifications to an existing civilian web-based weight loss programme. Ethical approval for the first study (MODREC Reference Number: 1105/361) has already been granted and the study is now complete.

Study 2: Interviews with overweight and obese RN ratings to assess the usability and uptake of the modified web-based weight loss programme. Ethical approval for the second study (MODREC Reference Number: 258/Gen/11) has already been granted, data collection is complete, and data analysis is in process.

Study 3: The aim of this study is to test the effect of the modified web-based weight loss programme among 40 overweight and obese RN personnel who use the website, compared to 40 overweight and obese RN personnel who do not use the website over 3-months.

Appendix L: Feasibility study folder for physical training instructors

Recruitment

There are two conditions to which participants may be allocated to, 1) Website plus PTI support group and 2) Waitlist control group.

We aim to recruit 80 overweight and obese RN personnel across 5 bases (approximately 15-20 overweight and obese RN personnel from each base). We expect that each group will have 40 participants.

The Website plus PTI support Group includes participants from the following bases:

HMS COLLINGWOOD, HMS NELSON, and HMS HERON

Participants from these bases will be able to access the POWeR website starting from October 1, 2012 till January 31, 2013.

PTIs at these bases will measure participants' height, body mass, and waist circumference at the start and at the end of the study.

At week 2 of participants having used the POWeR website, PTIs will arrange to meet participants for a 5–10 minute face-to-face chat as to how they have got on with the website (see Guidelines and Session content checklist).

The Waitlist Control Group includes participants from the following bases:

HMS SULTAN and HMS EXCELLENT

Participants from these bases will have the option of accessing the POWeR website starting from the February 1, 2013. Participants in this group do not need to use the website if they do not want to.

PTIs at these bases will measure participants' height, body mass, and waist circumference at the start and at the end of the study. PTIs do not meet with participants for a face-to-face chat.

ELIGIBILITY CHECKLIST FOR PHYSICAL TRAINING INSTRUCTORS

Who can take part in the POWeR study?

PART 1

If participants answer 'yes' to any of the questions below, they are ineligible to take part in the study.

Currently following a weight loss programme?

Have recently lost more than 5% of body mass?

In the process of quitting smoking?

Pregnant or planning pregnancy?

Taking hormone-based contraception?

PART 2

Potential participants are male and female, junior and senior ratings satisfying the criteria below:

Have a body mass index above 25

Have access to a computer with internet from September 2012 till January 2013

Likely to be at this base in 3 months' time – this is to make sure that participants will be around for their follow-up measurements.

NEXT STEPS

Provide participant's with a Participant Information Sheet and a consent form

Give participants unique study ID code

Get participant's name, telephone number, email address



THE POWeR STUDY

Concerned
about your
health?

Are you overweight
and interested in
losing weight?

Would you like to learn about POWeR tools that may help you maintain a healthy weight?

The POWeR program is an interactive website for weight loss that has been developed by health experts at the University of Southampton in collaboration with the Institute of Naval Medicine. The website uses the most recent scientific evidence.

With your help, we will test the effects of the POWeR program for weight loss in the RN.

You can take part in this study if you:

Have a Body Mass Index (BMI)* over 25; are aged 18-55

Have access to a computer and internet from Sept 2012 – Jan 2013

If you would like to take part in the POWeR study you will:

-Be allocated to the immediate access group or the delayed access group.

-The immediate access group will begin using the website from Sept 2012 for 12 weeks OR the delayed access group will be able to use the website after January 2013.

For further details please contact Gülcan Garip:

Email: G.Garip@soton.ac.uk or Telephone: 02380 591 2581

*Online BMI calculator: <http://www.nhs.uk/Tools/Pages/Healthyweightcalculator.aspx>

Appendix L: Feasibility study folder for physical training instructors

PARTICIPANT INFORMATION SHEET

Study title

The effect of a web-based weight loss intervention on overweight and obese Royal Navy personnel's efforts to lose weight

Invitation to take part

You are invited to participate in this research project conducted by the Institute of Naval Medicine and the University of Southampton, which was tasked by the Department of Naval Physical Development.

You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve.

Please take time to read the following information carefully and discuss it with others if you wish.

Feel free to ask the researcher (contact details below) if there is anything that is not clear or if you would like more information.

If you would like to take part, please let us know if you have been involved in any other study regarding weight loss during the last year.

What is the purpose of the research?

This study will test the effect of a weight loss website for overweight and obese personnel working in the Royal Navy who want to lose weight.

All participants in this study will be able to access the website, however, some participants will be allocated to the immediate-access group and some participants will be allocated to the delayed-access group.

If you are allocated to the immediate-access group, you will be able to use the website from January 2013 to April 2013.

If you are allocated to the delayed-access group, you will be able to use the website after April 2013.

Appendix L: Feasibility study folder for physical training instructors

It is crucial for all participants to meet with the physical training instructor on base (details in *What will I be asked to do?*) and complete the questionnaires so that we can find out whether people using the website benefited.

Who is doing this research?

The researcher is Gülcan Garip, a trainee health psychologist on the PhD Health Psychology programme at the University of Southampton.

Why have I been invited to take part?

All Royal Navy personnel between the ages of 18-55, have a Body Mass Index (BMI) of at least 25, are concerned about their weight, and have access to a computer with internet until April 2013 are eligible to take part in this study.

Personnel who: are planning pregnancy; are following a weight loss programme; have recently lost more than 5% of their body mass, or who are in the process of quitting smoking may not take part. Please let the PTI know if any of these conditions apply to you.

Do I have to take part?

No, participation in the study is entirely voluntary.

What will I be asked to do?

Information about the website

This is a weight loss website that has been developed for RN personnel who are overweight or obese and want to lose weight. The website aims to give you tools and advice that may help you lose weight and maintain your reduced weight in the long-term. The content of the website is based on the most recent scientific evidence.

The website consists of 11 sessions and each session will take about 15-20 minutes to complete, except for the first session which may take about 30 minutes.

The website has been designed for you to use one session each week. You can decide when and where you will access the website

How do I use the website?

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Access the website from the link that will be emailed to you.

Register on the website (make a note of your username & email address used to register).

Once you complete registration, click the 'log out' button to return to the homepage.

Login to the website using your username and password to use session 1.

At the end of each session it is important that you click the 'logout' button; otherwise the next time you sign in, you will have to start from the beginning of that particular session.

What will I be asked to do if I decide to take part in this study?

After you contact the physical training instructor (PTI), you will make arrangements for a meeting where the PTI will ask you to sign a consent form, and take your height, weight and waist circumference measurements.

You will receive an email from the researcher (Gulcan Garip; G.Garip@soton.ac.uk) detailing which group you have been allocated to (i.e. immediate-access* or delayed-access*) and a link to complete a series of questionnaires.

Depending on which group you have been allocated to, you will either be able to access the POWeR website immediately or you will continue what you typically would do in terms of your diet and physical activity and access the POWeR website after January 2013.

If you have been allocated to the immediate-access group, you will arrange a meeting with the PTI for two weeks' time to discuss your progress and to ask any questions you might have.

Whether you are in the immediate-access or delayed-access group, all participants will meet with PTIs in three months' time for the PTIs to take your weight and waist circumference measurements.

In three months' time you will receive a link to complete a second set of questionnaires.

**If you are allocated to the immediate-access group, you will be able to use the website from January 2013 to April 2013.*

**If you are allocated to the delayed-access group, you will be able to use the website*

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after April 2013.

If you have been allocated to the delayed-access group, it is crucial that you meet with the PTI and complete the questionnaires so that we can find out whether people using the website benefited.

What is the device or procedure that is being tested?

A weight loss website, Positive Online Weight Reduction (POWeR).

What are the benefits of taking part?

The website aims to give you tools and advice that may help you lose weight and maintain your reduced weight in the long-term.

A member of the study team will inform you whether you have been allocated to the immediate-access group or the delayed-access group.

What are the possible disadvantages and risks of taking part?

There are no disadvantages to taking part in terms of your Service career, as this will not be affected in any way by your participation or the findings of this research. No-one within the RN will have access to any of your data, except the PTI who will take your height, weight and waist circumference measurements.

Participation in this study will not expose you to any further risks than you would expect to encounter in your daily life. You may become distressed or frustrated as a result of not being able to achieve the goals you set using the website and you may feel worried about your weight. If so, you could consult your GP or PTI to discuss other ways to manage your weight.

Can I withdraw from the research and what will happen if I don't want to carry on?

You may withdraw from the study at any time without giving a reason.

Are there any expenses and payments which I will get?

No.

Will my taking part or not taking part affect my Service career?

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No, not in any way.

Whom do I contact if I have any questions or a complaint?

If you have any questions about the research, you can contact the researcher Ms Gülcan Garip, at G.Garip@soton.ac.uk or Dr Bob Bridger, at inm-ems-hhfd@mod.uk or Dr Martina Prude (Head of Research Governance at the University of Southampton, *study reference number: GG 10*), at rgoinfo@soton.ac.uk or the MoDREC secretariat, at ethics.sec@dstl.gov.uk; telephone: 01980 658849. If you would like to make a complaint about the research please contact Dr Dan Roiz de Sa, at inm-ems-stmcmo1@mod.uk.

What happens if I suffer any harm?

In the event of you suffering any adverse effects as a consequence of your participation in this study, you will be eligible to apply for compensation under the MoD's 'No Fault Compensation Scheme' (see separate sheets for details).

What will happen to any samples I give?

Not applicable.

Will my records be kept confidential?

Upon completion of the study, all records will be stored securely in accordance with the Data Protection Act (1998) at the Institute of Naval Medicine and the University of Southampton.

Who is organising and funding the research?

The Institute of Naval Medicine is organising and conducting the study, which was tasked by DNPd. The study is also supported by the University of Southampton.

Who has reviewed the study?

A full scientific protocol for this research has been approved by the Ministry of Defence Research Ethics Committee and the University of Southampton School of Psychology

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Ethics Committee. This study complies and at all times will comply with the Declaration of Helsinki³ as adopted at the 52nd WMA General Assembly, Edinburgh, October 2000 and with the Additional Protocol to the Convention on Human Rights and Biomedicine, concerning Biomedical Research, (Strasbourg 25.1.2005). Ask the Principal Investigator, Gülcan Garip, if you would like further details of the approval or to see a copy of the full protocol.

Further information and contact details.

The study is run by Ms Gülcan Garip, tel: 0794 3646420; email: G.garip@soton.ac.uk

Compliance with the Declaration of Helsinki.

This research complies with the Declaration of Helsinki.

³ World Medical Association (2000) Declaration of Helsinki. Ethical principles for medical research involving human subjects. 52nd World Medical Association General Assembly, Edinburgh, Scotland October 2000.

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CONSENT FORM FOR PARTICIPANTS IN RESEARCH STUDIES

Title of Study: The effect of a web-based weight loss intervention on overweight and obese Royal Navy personnel's efforts to lose weight

Ministry of Defence Research Ethics Committee Reference: 330/GEN/12

The nature, aims and risks of the research have been explained to me. I have read and understood the Information for Participants and understand what is expected of me. All my questions have been answered fully to my satisfaction.

I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and be withdrawn from it immediately without having to give a reason. I also understand that I may be withdrawn from it at any time, and that in neither case will this be held against me in subsequent dealings with the Ministry of Defence.

I consent to the processing of my personal information for the purposes of this research study. I understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.

I agree to volunteer as a participant for the study described in the information sheet and give full consent.

This consent is specific to the particular study described in the Information for Participants attached and shall not be taken to imply my consent to participate in any subsequent study or deviation from that detailed here.

I understand that in the event of my sustaining injury, illness or death as a direct result of participating as a volunteer in Ministry of Defence research, I or my dependants may enter a claim with the Ministry of Defence for compensation under the provisions of the no-fault compensation scheme, details of which are attached.

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Participant's Statement:

I _____ agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information for Participants about the project, and understand what the research study involves.

Signed

Date

Witness:.....

Name :.....

Signature:.....

Investigator's Statement: I

_____ confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the Participant.

Signed Date

AUTHORISING SIGNATURES

The information supplied above is to the best of my knowledge and belief accurate. I clearly understand my obligations and the rights of research participants, particularly concerning recruitment of participants and obtaining valid consent.

Signature of Chief Investigator

.....

Date

Name and contact details of Chief Investigator:

Appendix M – Theory of Planned Behaviour Questionnaire; Treatment Self-Regulation Questionnaire; Godin Leisure-Time Exercise Questionnaire



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Southampton



Please do not include your name anywhere on the questionnaires.

Please answer the following questions about following the POWeR weight reduction eating plans.

	<i>Disagree</i>							<i>Agree</i>
	1	2	3	4	5	6	7	
Following this weight reduction eating plan will benefit me	<input type="radio"/>	***						
Following this weight reduction eating plan will be useless	<input type="radio"/>	***						
Following this weight reduction eating plan will make me feel good	<input type="radio"/>	***						
Following this weight reduction eating plan will be unpleasant	<input type="radio"/>	***						
My family and friends think that I should follow this weight reduction eating plan	<input type="radio"/>	***						
My doctors and nurses think that I should follow this weight reduction eating plan	<input type="radio"/>	***						
It will be possible for me to follow this weight reduction eating plan	<input type="radio"/>	***						
I will find it easy to follow this weight reduction eating plan	<input type="radio"/>	***						
I intend to follow this weight reduction eating plan	<input type="radio"/>	***						
I plan to follow this weight reduction eating plan	<input type="radio"/>	***						

Please answer the following questions about using POWeR to increase your physical activity.

	<i>Disagree</i>							<i>Agree</i>
	1	2	3	4	5	6	7	
Increasing my level of physical activity will benefit me	<input type="radio"/>	***						
Increasing my level of physical activity will be useless	<input type="radio"/>	***						
Increasing my level of physical activity will make me feel good	<input type="radio"/>	***						
Increasing my level of physical activity will be unpleasant	<input type="radio"/>	***						
My family and friends think that I should increase my level of physical activity	<input type="radio"/>	***						
My doctors and nurses think that I should increase my level of physical activity	<input type="radio"/>	***						
It will be possible for me to increase my level of physical activity	<input type="radio"/>	***						
I will find it easy to increase my level of physical activity	<input type="radio"/>	***						
I intend to increase my level of physical activity	<input type="radio"/>	***						
I plan to increase my level of physical activity	<input type="radio"/>	***						

Thank you for taking the time to fill out these questionnaires!

Please do not include your name anywhere on the questionnaires.

Appendix M: Measures used in the feasibility study

The following questions ask about the reasons why you want to use the POWeR online programme for weight loss. Different people will have different reasons for doing that, and we want to know how true each of the following reasons is for you.

Please indicate the extent to which each reason is true for you, using the following 7-point scale:

Please answer all the questions below before moving onto the next page ***

The reason I would like to use the POWeR online programme for weight loss is:	Not true at all	2	3	Somewhat true	5	6	Very true	7	***
1. Because I feel that I want to take responsibility for my own health.	<input type="radio"/>	***							
2. Because I would feel guilty or ashamed of myself if I did not.	<input type="radio"/>	***							
3. Because I personally believe it is the best thing for my health.	<input type="radio"/>	***							
4. Because others would be upset with me if I did not.	<input type="radio"/>	***							
5. Because I have carefully thought about it and believe it is very important for many aspects of my life.	<input type="radio"/>	***							
6. Because I would feel bad about myself if I did not.	<input type="radio"/>	***							
7. Because it is an important choice I really want to make.	<input type="radio"/>	***							
8. Because I feel pressure from others to do so.	<input type="radio"/>	***							
9. Because it is consistent with my life goals.	<input type="radio"/>	***							
10. Because I want others to approve of me.	<input type="radio"/>	***							
11. Because it is very important for being as healthy as possible.	<input type="radio"/>	***							
12. Because I want others to see I can do it.	<input type="radio"/>	***							

Thank you for taking the time to fill out these questionnaires!

Please do not include your name anywhere on the questionnaires.

Appendix M: Measures used in the feasibility study

Considering a 7 day period (a week), please circle how many times on average do you do the following kinds of exercise for more than 15 minutes during your free time?

- 1) Strenuous exercise (Heart beats rapidly) (e.g. running, jogging, football, squash, rugby)

1 2 3 4 5 6 7

- 2) Moderate exercise (Not exhausting) (e.g. fast walking, easy bicycling, swimming, badminton)

1 2 3 4 5 6 7

- 3) Mild exercise (Minimal effort) (e.g. yoga, bowling, golf, easy walking, pilates)

1 2 3 4 5 6 7

Considering a 7 day period (a week) during your leisure-time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

- a) Often b) Sometimes c) Never/Rarely

Thank you for taking the time to fill out these questionnaires!

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