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UNIVERSITY OF SOUTHAMPTON

FACULTY OF MEDICINE

Primary Care and Population Sciences

**Identifying the Theoretical Components and Technical Characteristics of a
Prototype Intervention to Support and Promote Self-Care
for Cold and Flu Symptoms**

by

Panayiota Andreou

Thesis for the degree of Doctor of Philosophy

July 2015

UNIVERSITY OF SOUTHAMPTON

ABSTRACT

FACULTY OF MEDICINE

Primary Care and Population Sciences

Doctor of Philosophy

IDENTIFYING THE THEORETICAL COMPONENTS AND TECHNICAL
CHARACTERISTICS OF A PROTOTYPE INTERVENTION TO SUPPORT AND
PROMOTE SELF-CARE FOR COLD AND FLU SYMPTOMS

by Panayiota Andreou

The primary aim of this thesis was to present the development of the prototype of a theory-based web intervention aiming to support decision-making of the general adult population on whether to seek professional help or self-care for acute respiratory tract infections. The thesis comprised of a systematic review, two qualitative studies, one survey, and a step-by-step development of the intervention. All the empirical studies aimed to identify the theoretical and technical components that could improve the intervention. The systematic review of 18 trials aimed to identify the effectiveness of health educational materials in improving health outcomes for minor ailments such as physical health and health service use. There was mixed evidence regarding the factors that influence primary care consultations; providing educational information outside consultation appeared to be most effective. The piloting of the intervention elicited feedback, via 21 interviews, regarding the content of the intervention e.g. reducing the length of the information, making screening questions clearer, and clarifying when they need to seek professional help. Comments about the format included improving the navigation and aesthetics of the materials by adding more pictures and colour as well as reducing the use of jargon language. The second qualitative study aimed to elicit the underlying reasons to consult a clinician. Findings indicated that consultation was linked to uncertainty about the symptoms, severity and the impact on everyday activities, and past antibiotic prescribing. The theories closely identifying with the arising constructs were Social Cognitive theory, the Common Sense of Illness Representations, and the Beliefs about Medication. The last study of thesis, a survey of

323 participants, showed that the most significant factors linked to the decision not to seek professional help were strong beliefs that symptoms can resolve on their own and seeking help from the pharmacist prior seeing the GP. The findings from the empirical studies contributed further into the development of the intervention as a new resource to help individuals decide whether to seek professional help or self-care for their symptoms. Further work for the online version of the intervention, including tailoring of theoretical factors and including more representative sample, can enhance its validity and effectiveness.

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DECLARATION OF AUTHORSHIP

I, Panayiota Andreou

declare that the thesis entitled

Identifying the theoretical components and technical characteristics of a prototype intervention to promote self-care and reduce consultations for cold and flu symptoms

and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- this work was done wholly or mainly 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;
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- parts of this work have been published as: Yardley, L., Morrison, L.G., Andreou, P., Joseph, J., Little, P. (2010). Understanding reactions to an internet-delivered health-care intervention: accommodating user preferences for information provision. *BMC Medical Informatics and Decision Making* 2010, 10 (1), 52. doi:10.1186/1472-6947-10-52

Signed:

Date:

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Definitions and Abbreviations

CI	Confidence Intervals
CSM	Common Sense Model
HBM	Health Belief Model
IPQ-R	Illness Perception Questionnaire-Revised
LRT	Lower Respiratory Tract
LRTs	Lower Respiratory Tract Symptoms
MAS	Minor Ailments
MI	Minor Illness
MUS	Medically Unexplained Symptoms
OTC	Over the Counter
RCT	Randomized Controlled Trial
RTI	Respiratory Tract Infections
SCT	Social Cognitive Model
URT	Upper Respiratory Tract

Chapter 1 Introduction to the thesis

The research of this thesis presents and discusses the development process of the prototype of a theory-based web intervention designed to support decision-making of the general adult population on what to do when experiencing a range of acute respiratory tract infections (ARTI) including cold and flu symptoms. In particular, the thesis aims to identify the theoretical components and technical characteristics of the proposed intervention prototype through a series of studies outlined below. The intervention specifically aims to: a) empower individuals by providing detailed up-to-date personalized interactive information about their symptoms available at any time, b) provide advice to users on whether their symptoms suggest they need to seek professional attention, c) encourage medically appropriate use of primary care consultation time, and d) information for self-care if appropriate.

The thesis comprises of eight chapters. The following section presents an overview of each chapter followed by a detailed discussion of the rationale for developing a web intervention for cold and flu symptoms including the context of the various areas the intervention draws from.

1.1 Introduction to the structure of the thesis

The first chapter discusses the epidemiology of acute respiratory tract infections (ARTI), its implications and subsequently addresses the literature that underlines each of the key components of the prototype intervention. Despite of a range of policy guidelines encouraging the support of self-care management and the expressed needs from individuals for more information to support their decision-making in self-care, there is little research in how online technologies may be used for the self-management of minor, acute symptoms. This is in contrast to the increasing research in internet interventions to support self-management of long-term conditions and health promotion. The chapter discusses the various components which comprise the development of the intervention along with current evidence of their effectiveness.

Chapter 2 reviews the literature on address minor illnesses in general as well as symptoms related to ARTI across age groups on how people cope when they are unwell due to

various symptoms of ARTI and on the factors that lead people to seek professional help for such conditions. The review also identified the various psychological constructs that could explain further the underlying processes of such behaviour. The review was based on both quantitative and qualitative studies.

Chapter 3 presents and discusses the findings of a systematic review assessing the effectiveness of 18 randomized controlled trials delivering health education information to the general public for minor ailments, including ARTI symptoms. The review also investigated whether the characteristics of health information such as the format of delivering the intervention, the focus and the setting the intervention is set can influence outcomes. In addition, the review explores the underlying theoretical constructs or assumptions and whether they inform the development and/or evaluation of the interventions.

Building on the evidence from the previous chapters, chapter 4 presents the development of the paper-format of the web-intervention of the thesis. Due to lack of resources to fund the programming of the web-intervention, the prototype was designed and developed in paper as closely as it would have appeared online. The chapter describes in detail the structure and the content of the prototype intervention pages, the rationale for each type of health message included together with extracts drawn from the intervention materials.

The evaluation of the usability and acceptability of the intervention is presented in Chapter 5. Through the qualitative methodology of think aloud the participants went through each page of the intervention and commented on the content and format of the website.

The second qualitative study of the thesis is presented in Chapter 6; the study investigates the factors that lead people to seek professional help for their cold and flu-type symptoms. Continuing from the literature review of chapter 2, this chapter seeks to provide further evidence on the factors underlying people's coping behaviour when they are unwell. The chapter also seeks to explain such evidence within relevant theoretical frameworks in order to provide a clearer understanding of the mechanisms and the processes that influence decisions to seek professional help.

Chapter 7 presents a survey study aiming to identify the most significant predictors of seeking professional help for ARTI including flu-type symptoms amongst the adult general public. The survey comprises a range of questionnaires based on relevant literature and on theoretical constructs arising from the literature review (chapter 2) and the qualitative study on peoples' experiences of being unwell with cold and flu-type symptoms (chapter 6).

The final chapter, chapter 8, presents a general discussion of the research. It discusses the arising implications from the findings of the empirical studies, the methodological shortcomings, and suggestions for future directions of the work.

The empirical studies of the thesis, chapters 4 to 7, focus on ARTI including cold and flu symptoms and on adults only. However, the literature review and the systematic review (chapters 2 and 3 respectively) take a broader view by including studies that investigate self-care and consultation behaviour amongst both adults and children. In addition, the first three chapters do not focus solely on ARTI including cold and flu symptoms but also extend to the more general term of minor ailments (MA) or minor infections. This term includes infections and symptoms, such as ear and eye infection and urinary tract infection, that share similar characteristics with ARTI symptoms, i.e. they are considered as acute and self-limiting, have relatively short duration, and do not impose severe threats to health. The reason for taking this broader approach in chapters 2 and 3 was that a considerable part of the literature addressing behaviour and behaviour change interventions related to ARTI is embedded within the literature referring to MA. Similarly, studies include adults and/or children thus it was considered important to bring and discuss all the evidence together in order to gain a broader understanding of similarities and possible difference in how people think, understand and react to infections labelled as 'minor' as well as to more specific ones such as ARTI.

This chapter is divided into four sections: the first section presents the rationale for developing an intervention targeting ARTI including their prevalence and impact, and the self-care schemes aiming to address the arising implications. The second section discusses the role of the internet in health, the advantages of using this platform as an intervention delivery mode and consequently the evidence of its effectiveness. The third section explains the rationale of including theory in the development of health interventions

including internet-based programs. The fourth section discusses the technique of tailoring in making health messages more relevant and more effective in influencing behaviour, followed by a discussion of why tailoring works and its effectiveness in health behaviour change including internet-based programs.

The literature was identified by searching the databases of EMBASE, MEDLINE, PsycInfo, and CINAHL with MeSH words or combination of keywords and MeSH words: health education, self-care, primary care, respiratory tract infections, consultations, visits, antibiotic prescribing, tailoring, e-health, online, interventions. In addition, the references of relevant articles were searched as well as the search options of 'cited by' and 'related articles' provided by Google scholar.

1.2 The Rationale for Developing an Intervention for Acute Respiratory Tract Infections

1.2.1 The Prevalence of Acute Respiratory Tract Infections

All people of all ages experience acute respiratory tract infections (ARTI); they are the most common illnesses worldwide (Monto 2002) and the most common reason for consulting a GP (McCormick *et al.*, 1995; Akkerman *et al.*, 2004). These illnesses include any infectious disease of the upper or lower respiratory tract (URT and LRT). The URT consists of the nose, nasal cavity, frontal sinuses, ethmoidal air cells, sphenoidal sinuses, maxillary sinus, pharynx, and acute infections of this system include the common cold, tonsillitis, sinusitis and sore throat. Such infections often spread to the LRT, such as the trachea, bronchial tubes and the lungs, and infections of these areas include pneumonia, acute bronchitis, and laryngitis. Chronic conditions such as asthma, emphysema, or allergy related symptoms, such as hay fever or allergic rhinitis, are not considered part of ARTI although symptoms associated with ARTI, such as cough, can also be common for acute exacerbations of chronic conditions such as asthma (Morice *et al.*, 2006).

In general, the majority of ARTI are primarily caused by viruses (Monto 2002) especially rhinovirus, influenza virus, and respiratory syncytial virus (Monto 2002; Wat 2004; van Gageldonk-Lafeber *et al.*, 2005). Seasonality is one of the characteristics of respiratory viruses (Monto 1994) where common viruses such as influenza occur mainly in the winter to early spring, whereas rhinoviruses cause respiratory infections in all months of the year

with peaks of illness in the autumn and spring. Very early studies have shown that children are at particular risk of developing viral respiratory tract infections (e.g. Frost *et al.* 1932 cited in Monto 2002) where the highest incidence is observed amongst the youngest age groups, decreases with increasing age (Monto 1994) and increases again amongst the elderly (Fleming and Elliot 2005); symptomatic infections of this kind occur at rates of 2-5 per adult person per year whereas for schoolchildren is 7-10 episodes per year (Morice *et al.*, 2006). Similarly, consultations for the young age group of 0-4 are four times greater than for adults (Health Protection Agency 2005).

1.2.2 Impact and implications of ARTI

The symptoms related to ARTI are acute in nature i.e. they have a relatively short duration, they are self-limiting and although they can have a considerable impact on body functioning and daily activities, they are not considered as life-threatening (Saginur 2001). Mortality related to ARTI has declined in the developed countries, now mostly occurring under conditions such as extremes of age, having other ongoing chronic conditions, or from specific pathogens such as influenza (Monto 1994). For example, patient groups at high risk of a severe course of viral ARTI are premature babies, patients with underlying pulmonary disease or with congenital heart disease (Van Woensel *et al.*, 2003). In some cases, ARTI symptoms can develop serious complications or they may indicate a more serious condition than initially suspected, such as pneumonia and meningitis, and necessitate intensive treatment and possible hospitalization (File 2000). However, in the great majority of cases the symptoms are benign, do not suggest any serious complications, and prescribed treatment is often unnecessary (Tan *et al.*, 2008).

The major impact of ARTI is exerted through morbidity, impairment of personal health, decreased productivity, and loss of time at work and school (Monto 2002; Bertino 2002; Morice *et al.*, 2006; So *et al.*, 2010). However, it appears that the treatment decisions of dealing with ARTI and the arising implications cause major concern possibly more than the impact of the infections themselves. Specifically, despite the fact that most of the presenting symptoms of ARTI resolve on their own and can be self-managed by people at home (e.g. Macfarlane *et al.*, 2002; Ashworth *et al.*, 2005), these illnesses are the most common reason for primary care visits (Health Protection Agency 2005). This suggests that a significant number of consultations or re-consultations for ARTI may be unnecessary and could be impeding the optimum use of health resources such as consultation time and

the quality of care provided to patients (Howie *et al.*, 1999) at the expense of other more urgent and complicated conditions. It is estimated that a quarter of the population visit their GP every year due to a respiratory tract infection (Fleming *et al.*, 2003; Ashworth *et al.*, 2004) and these numbers could account for up to 40% of GP appointments and 18% of their total work load (Department of Health 2005), exceeding the workload generated from conditions such as diabetes, asthma and heart problems (Rambihar 2001; Fleming *et al.*, 2003) with a substantial associated economic cost amounting to £170 million per annum (Health Protection Agency 2005).

The impact on individual and public health is exacerbated when consultations are followed by antibiotic prescription for uncomplicated respiratory tract infections. Evidence shows that the highest proportion of antibiotic prescribing in primary care is for RTI (Tan *et al.*, 2008). In a historical overview of the role of antibiotics in the management of common infections including respiratory infections, (Cosby *et al.*, 2007) argued that up to mid-nineties many common infections were considered as urgent, partly because there was a high rate of serious complications. Consequently a considerable number of such infections were dealt with by prescribing antibiotics often overestimating their effectiveness. Later on though, factors such as improvement, at least in the west, in hygiene, housing, diet have led to a decline in infectious disease mortality (Cosby *et al.*, 2007). At the same time consistent evidence showed that antibiotic use in the management of such infections is highly questionable as there is limited efficacy in treating a large proportion of ARTI including acute otitis media, sore throat, and the common cold (Williams *et al.* 2003; Del Mar *et al.* 2006; Arroll and Kenealy 2007). Antibiotic prescribing in England declined nearly a quarter between 1996-2002 (Majeed *et al.*, 2004) but this has remained constant since then with concerns that current levels are still high compared to other EU countries such as Netherlands (Gulliford *et al.*, 2009).

The unnecessary use of antibiotics has serious implications as it promotes the emergence and spread of antibiotic-resistant organisms (Gonzales *et al.*, 2001; Ashworth *et al.*, 2004; Costelloe *et al.*, 2010) becoming one of the most serious public health issues (Reeves *et al.*, 2005; WHO 2014). Increased antibiotic resistance demands new more powerful drugs to be produced in order to control infections however, there is lack of development of new antimicrobial drugs (Norrby *et al.* 2005). In addition, widespread and inappropriate use of antibiotics also contributes into the medicalisation of the conditions by encouraging belief

in the need for antibiotics and re-consultation, and subsequently an increased cost of treatment and waste of resources (Ashworth *et al.* 2005; Little and Williamson 1995). These arguments are echoed in the conclusions and recommendations on antimicrobial resistance made by the European Union Council and the work carried out by the European Centre for Disease Prevention and Control. It has shown that about half of the 37000 deaths a year, caused by infections related to health care in the European Union member states, are due to multidrug resistant bacteria (Council of the European Union 2008) thus leading to increased calls and pressure for prudent use of antibiotics, i.e. prescribed only when needed in the correct doses and for the recommended duration. The latest guidelines published by (National Institute of Health and Clinical Excellence (NICE) 2008) on antibiotic prescribing for self limiting respiratory tract infections reinforce the comprehensive evidence suggesting that antibiotic treatment gives no clinical benefit to most people and complications are rare if antibiotics are not prescribed (Guildford 2009). Therefore the calls to reduce antibiotic prescriptions continue although this needs to be done without compromising the incidence of infections and complications (Cosby *et al.* 2007). The challenge is producing the evidence that could identify the group of patients who will benefit from antibiotic use as there are still no tools available for diagnostic and prescribing decisions that can help to tailor antibiotics only to those that can benefit (Hopstaken *et al.*, 2006; Cosby *et al.*, 2007).

The reductions in prescriptions mentioned earlier have been associated with observed reductions in consultations for ARTI (Fleming *et al.* 2003; Ashworth *et al.* 2006) especially for common cold and sore throat (Ashworth *et al.*, 2004). One plausible explanation for this reduction is that people consult in order to get a prescription thus further intervention efforts targeting reduction of prescribing can lead to reduced consultations (Ashworth *et al.*, 2005). However, there are other reasons underlying people's decisions to seek professional help for their illness other than getting a prescription, e.g. seeking reassurance, as discussed later in chapter 2.

1.2.3 Self-care support initiatives to address the impact of ARTI

Only a small proportion of the incidence of ARTI illness and symptoms in the community are presented to the GP, nonetheless a great proportion of consultations for ARTI, or minor ailments in general, are considered as unnecessary as individuals could address such symptoms themselves without medical input and risk for complications, and ultimately

health resources could be diverted elsewhere. Small reductions in health services use for common conditions could result in large savings on a national level (Rose 1992; Rogers *et al.*, 1999; Francis *et al.*, 2008). Self-care is increasingly seen as a hidden resource that could be utilized to improve health services use (Chapple and Rogers 1999) and, in primary care in particular, can potentially reduce inappropriate consultations, i.e. consultations for symptoms individuals could address themselves without medical input and risk for complications. Thus increasing self-care utilization is viewed as a significant factor which can raise awareness for preventive action aiming to promote and maintain good health and potentially have significant financial savings in healthcare (Wanless report DoH 2002). A number of government guidelines and reports have set self-care as one of the core principles for modernising and rebuilding of the health services and developed initiatives to support it (e.g. Self Care – A real choice, DoH 2005; Choosing Health, 2004; Building on the Best 2003). Evidence shows that in general individuals feel they are active in caring for their own ailments; in a survey carried out by the DoH (Public Attitudes to Self Care-Baseline Survey, DoH 2005), 87% of the respondents said they often treat minor ailment themselves and 92% agreed that the first thing they do when they are ill is to seek information to take care of themselves. Nonetheless, people appear to be very interested in wanting to do self care and 90% would like to play a greater role in treating their minor ailments.

The same governmental guidelines argue that supporting self-care involves increasing the capacity, confidence and efficacy of the individual for self-care by providing a range of options such as appropriate and accessible advice and information, participation of the public in design and implementation of local programmes, developing multi-media multi-lingual self-care facilities and information materials. However, no evidence was presented to demonstrate how the above could be applied and evaluated.

Considering the above evidence regarding the impact and the implications of respiratory tract infections and the subsequent government policies on self-care, this thesis presents the development of the prototype of a web intervention targeting the general adult population. The intervention provides advice on a selection of symptoms related to ARTI on whether they indicate the attention of professional help and information on self-care where appropriate, while considering the issues arising related to the components and characteristics of the intervention.

1.2.4 Why focusing on the adults in the general public

Although the highest consultations rates are observed amongst children (McCormick *et al.*, 1995) the development and the piloting of the intervention of this thesis focuses on adults only. This is because in terms of absolute numbers there are more adult consultations, and many consultations observed amongst adults are considered as unnecessary as doctors can offer little in terms of prescriptions and can offer advice on how to self-care (Ashworth *et al.*, 2005). Furthermore, individuals express the need for more information on how to deal with their symptoms and health, as seen earlier, whether their symptoms suggest they need to seek professional help. In addition, the impact of information in the first instance is more easily assessed in adults. A third reason for including adults only for this thesis is the evidence of variation on how people react to the illness of their child depending if this is their first child or not, as seen later in chapter 2. In particular adults caring for their only child react differently and have different queries compared to those who already have experience caring children. This increases the complexity of the information and the messages to be presented to the intervention users, thus it was decided to focus on adults only at the development stage of the intervention.

1.3 The rationale for using the internet to deliver the intervention

The second section of this chapter discusses the literature around the rationale of using the internet as the delivery mode of the intervention of this thesis. It discusses the use of internet for health information, the evidence about the effectiveness of internet behaviour change interventions, and finally the reasons why more people are not using the internet and the implications for internet health interventions.

1.3.1 Using the internet for health information

The use of internet to access health information and health services is increasingly becoming as the second most useful source after health care professionals (Diaz *et al.*, 2002). In the US, 56% to 80% of internet users seek health information (Cotton and Gupta, 2004; Fox and Falloes, 2003; Ybarra and Suman 2006) whereas a study of seven European countries showed a similar result of 71% of internet users (44% of the total sample) (Andreassen *et al.*, 2007). However, there is variation of use in different parts of Europe, i.e. the highest percentage of internet health users is found in northern Europe compared to the south-east region (Spadaro 2003). There has been an increasing concern about the impact of accessing internet health information on health care utilization i.e. whether

internet use may delay, replace or increase seeking of medical care (Cline and Haynes 2001; Robinson *et al.*, 1998). However, the evidence so far appears heterogeneous showing a positive relationship between internet and health care use (Nicholson *et al.*, 2005), a negative relationship (Eastin and Guinsler 2006), or no relationship (Bouche and Migeot 2008) ; Wagner *et al.* 2001) which could be partly attributed to the variability amongst the studies, e.g. different conditions, age groups and health care systems, and differences in measurement of health care use. Furthermore, the studies are based on cross-sectional designs thus it is difficult to draw causality inferences, and the increasing range and quality of online health sites do not allow insight of the interaction between what people see and the impact on their behaviour and attitudes.

1.3.2 Internet health interventions

Over ten years ago it was argued that little has been done to take advantage of the internet's potential and capabilities as a site for public health research and intervention at encouraging people to pursue healthcare behaviour (Cassell *et al.* 1998; Chamberlain, 1996). Subsequently the growing interest in accessing such information has led to a burgeoning number of studies delivering health behaviour change interventions using this medium (Bennett and Glasgow 2009; Lustria *et al.* 2009; Ritterband *et al.*, 2003). Before looking at the evidence regarding the effectiveness of internet health interventions the following section presents some of the well known advantages using the internet as an intervention delivery tool.

Advantages from using the internet as an intervention delivery mode

These include the provision of instantaneous access to boundless quantity of information; the flexibility to accommodate change of content very quickly with minimal cost; its accessibility from any place; the ability to reach many people very quickly; being able to reach a broad range of people in many places particularly isolated and stigmatised groups e.g. Alzheimer sufferers and their carers, and when there are resource constraints in providing conventional health services (Griffiths *et al.* 2006; Portnoy *et al.* 2008; Wantland *et al.* 2004). In addition, the internet facilitates the provision of personal feedback and the use of tailored messages in interventions becomes more promising with the combined use of computer technology and internet-based applications (Lustria *et al.* 2009; Verheijden *et al.* 2008). In particular, the increasing sophistication of computer technology allows the automate collection of personal information which can be quickly matched with the

appropriate health messages and provide individualized feedback. This increasing relevance of the information to the individual facilitates longer web sessions and increases visits to the particular intervention (Wantland 2006). A more detailed discussion on tailoring is presented later in the chapter.

Effectiveness of internet health interventions

As already mentioned earlier, there have been numerous studies utilising the increasing capacity of the internet to develop interventions in the area of health care behaviour. The majority of interventions aim to support self-management of long-term conditions or health promotion with comparatively little research aiming the management of minor, acute conditions (Yardley *et al.*, 2010a) so the evidence reviewed below is drawn from a range of health behaviours where internet intervention was used.

There is emerging empirical evidence of positive outcomes across a wide range of behaviours (Bennett and Glasgow 2009) supporting the use of internet interventions for behaviour change. In particular, in a meta-analysis Wantland *et al.* (2004) compared the effectiveness of web-based versus non-web-based interventions, which mainly focused on chronic conditions, such as HIV/AIDS, eating disorders, asthma, and health promotion activities such as physical activity and weight control. Sixteen of the seventeen trials of the review showed improved knowledge and behavioural outcomes (e.g. increased exercise time, weight loss maintenance) in favour of the web-based interventions and six of those studies showed statistically greater improvements. However, it is difficult to form firm conclusions from the data as there was high degree of heterogeneity in the individual effect sizes, the trials were predominantly small and some studies had high level of attrition from the intervention groups. Furthermore, the review did not distinguish within the non web-based comparison group the face-to-face or paper-based studies in order to identify further whether any of these specific features were particularly disadvantaged or not to the web-based interventions. In a meta-analysis of 75 trials (Portnoy *et al.*, 2008)) looked at computer-delivered interventions for health promotion and behavioural risk reduction across a wide range of health domains such as overweight and obesity concerns, substance use, and sexual behaviour. The analysis showed small to medium positive improvements in behavioural outcomes such as reducing tobacco use, safer sexual behaviour, and improving nutrition. However, such positive change was not observed across all behavioural contexts e.g. not for physical activity, weight loss, and diabetes control. One possible explanation

could be the broad category of computer-delivered interventions included in the review, ranging from stand-alone systems delivered by a compact-disc to interventions based on the use of the internet, which could have masked the interaction of specific effective components of computer interventions with specific outcomes. Similarly, the comparison group comprised of a wide range of conditions e.g. wait-list and standard care, thus the analysis did not enable to identify which components of the intervention had, if any, advantage over specific comparison conditions.

A Cochrane review of 24 randomized controlled trials on chronic conditions by (Murray *et al.*, 2005) showed positive outcomes for the computer-based applications over the comparison groups on knowledge, self-efficacy, clinical outcomes such as functional status and hospitalisation visits, and some behavioural outcomes such as medication taking and physical activity. Similar to the review by Portnoy *et al.* (2008) there was a wide range of interventions and comparison categories which did not allow teasing out the conditions and components which had the most impact. Finally, the most recent and largest systematic review in the field comprising 85 internet interventions studies promoting behaviour change showed similar results of small but significant effect sizes in favour of internet interventions on various health behaviours including dietary behaviour, smoking abstinence, and alcohol consumption (Webb *et al.*, 2010) although no interventions addressed self-management of acute symptoms. As the authors note, the variability of the effect sizes draws attention to the importance of examining the characteristics and components of the interventions and how they relate to their corresponding effect size in order to identify the ingredients that contribute to their effectiveness.

In summary, the evidence so far suggests there is a consistent positive trend favouring computer-based, usually web-based interventions, over comparison groups on behavioural and clinical outcomes. However, effect sizes vary and the positive pattern does not appear across all outcomes. In addition, it is not clear from the evidence so far over which comparison groups the internet health interventions are most effective particularly if compared to face-to-face interventions. One needs to consider though whether it is always necessary for internet interventions to be superior to face-to-face delivery mode in order to be considered worthwhile and effective (Ritterband *et al.*, 2003; Ritterband and Tate 2009). The former can provide an option for those who cannot or choose not to seek face-

to-face treatment and can be used as an adjunctive component to a well-established and effective treatment to supplement materials or valuable time that clinicians may not have.

1.3.3 Why more people are not online

Despite the increasing number of online users there are challenges and obstacles in access and use of the internet and consequently for online health interventions, two of which are discussed below.

The first is the issue of trust: having trust in the information provided, and secondly, issues relating to health literacy. Trust in the web as an information source appears to be an important factor as it predicts web use and perceptions of the utility of the information found online. Although having access, a considerable number of people choose not to use the web for health information due to the value of trust they place on the information source they access (Rains 2007). Related to this, some primary care service users also report that they can see little or no benefit using the internet for their health concerns as they feel it can not enable them to deal better with their health (Rogers and Mead 2004). However, this evidence is based on accounts of individuals with severe chronic problems or long-term disability which may have different demands and expectations from health information sources and the healthcare services in general compared to less severe conditions such as ARTI.

Health literacy is another significant factor involved in people's engagement with health programs, and this is observed across delivery modes (Institute of Medicine 2009). It is defined as the capacity to obtain, interpret and understand health information to make appropriate health decisions (Ratzan and Parker 2000). Poor health literacy can result in poor ability to understand healthcare information, difficulty in acting on procedures and instructions, problems in accessing health services, and poor health status (Sihota and Lennard 2004). Health literacy is based on basic literacy skills thus limited literacy and numeric skills are significant obstacles in reading and interpreting health information. Low literacy is linked to lower economic circumstances (Nutbeam 2008) and this creates the question whether individuals with lower literacy levels may still have difficulty in understanding and utilizing the online health advice when there are no financial and other constraints to access and navigate through the new technology. Health literacy requires skills in identifying and evaluating health information, such as critical thinking skills in

choosing between medications or interpersonal skills and confidence to interact with the health care system, which are not immediately assumed in education and general literacy (Institute of Medicine 2004). Thus, many people with strong literacy levels struggle to understand a diagnosis, test results, or what the doctor has told them. Despite the strong influence of education in health literacy, the latter seems to be a convergence of several factors: education, cultural and social factors, and health services (Schmeida and McNeal 2007).

Difficulties with health literacy can be observed with any type of health intervention and there is no evidence that internet interventions demand higher health literacy level than any other delivery mode. Nonetheless, there is some research in the area arguing that the development of the internet and digital technology tools for health represent a fundamentally new form of language that requires a different form of literacy (Norman and Skinner 2006) named as e-health literacy. However, the majority of the skills required for e-health literacy already map onto the skills required for general health literacy with additional demands for skills to access the constantly evolving new technology and electronic resources for health information. Although health literacy cuts across various populations and education levels, there has been little research how to improve it particularly for limited-literacy audiences. A number of suggestions have been put forward to improve the readability of the health messages with techniques such as writing in active voice, short sentences, glossary for medical terms, use of graphics (Gilmour 2007); enhance the messages with visual and audio stimuli (Seidman 2009, cited in Institute of Medicine 2009) as well as pre-testing the information, and the intervention in general, to check if it is acceptable and usable by the target population.

In summary, the internet emerges as a powerful mean of communication for health and its increasing use encourages more investment in its capabilities for promoting and supporting self-care. This has also led to the development of online health interventions for a range of outcomes and the evidence so far suggests a positive trend favouring the use of internet as a dynamic platform for behaviour change programs. Nonetheless, there are still significant obstacles in internet use, such as trust in the information provided and health literacy, which may slow individuals from fully utilizing the potential of digital technology.

1.4 The rationale of including theory in the web intervention

Access to health information does not equate to changing behaviour (Bandura 1997a) and there is acknowledgement that there are factors other than provision of information that may hinder or encourage individuals to self-care and seek professional help. Some of these factors, drawn from the psychological literature, are linked to behaviour change. An important part of the intervention described in this thesis is based on theoretical models addressing behaviour change thus this section focuses on the literature underpinning the rationale for including behaviour change theories in health interventions and consequently for the intervention described in this thesis.

Health promotion programs aim to influence behaviour thus efforts aiming to identify and change the factors that determine and influence behaviour hold promise in improving health (Painter *et al.*, 2008). Social and psychological theoretical models of health behaviour change can be used to a) explain the structural and psychological determinants of behaviour, b) explain possible change, and c) guide the development and evaluation of health behaviour change programs (Glanz *et al.*, 2002). There is evidence suggesting that health programs based on theories are more effective in influencing health behaviour compared to studies not based on theory (Albarracin *et al.*, 2005) and in many instances interventions may benefit from drawing on various behaviour change theories.

Frameworks on how to develop and evaluate interventions such as the Medical Research Council (MRC) guidelines (Campbell *et al.*, 2000; Craig *et al.*, 2008) place theory at the very start of the intervention development stage as it enables a better understanding of the process of change of the target behaviour and subsequently contributes to the design, modelling and evaluation of the intervention. Thus as it is argued, ‘there is nothing so practical as a good theory’ (Lewin 1951 cited in Heaney 1998 p.564) and interventions without a theoretical underpinning fail to build on existing knowledge and limit the generalizability of the interventions as the causal mechanisms involved in the behaviour change are not unveiled (Michie and Abraham 2004b).

Nonetheless, there are some doubts about the contribution theories can make in an intervention over and above common sense and empirical evidence (Oxman *et al.*, 2005) and consequently their actual effectiveness for certain health behaviours such as obesity (Jeffery 2004). A major factor in this debate stems from the difficulty in bridging the gap between theory and practice, in other words how to translate and apply the various

components of a theory, or theories, into the intervention and consequently assess their unique impact on the target outcomes. The disentangling of each individual contribution becomes more challenging when additional variables are included in the intervention, such as various delivery modes (e.g. print materials, websites, telephone contacts) delivered by different individuals (e.g. nurse, doctor, pharmacist) at numerous settings (e.g. home, worksites, schools), with varied duration and intensity. Thus the focus is not solely on whether an intervention works or not but also establishing an understanding how the intervention works i.e. identifying the 'active ingredients' or the causal mechanisms of the intervention outcomes (Collins *et al.*, 2005). This will help to isolate the factors that facilitate behaviour change, identify effective core components and moderating variables, and allow building knowledge of successful intervention components across behaviours.

However, few intervention evaluations describe the details of their programs and the relationship between the components of the intervention and end outcomes (Michie *et al.*, 2009). In addition, although many behaviour change interventions claim to be theoretically based, very few detail which theoretical components were used, how they were applied in the design and measurement of the program, and consequently whether the evaluation reflected this process (Painter *et al.*, 2008). This suggests that wheels are re-invented, i.e. each intervention development and evaluation occur in isolation with little opportunity to build from previous experiences of what works or not (Michie 2008; Michie *et al.*, 2009). Consequently there is an increasing call for a) to provide precise descriptions of what the intervention includes, b) to explain how theory-based components are applied in the intervention, and c) to experimentally assess which components, or combination of components, are critical to intervention effectiveness (Michie and Abraham 2004a; Eccles *et al.*, 2005; Abraham and Michie 2008).

Theory and Internet interventions

The application of theory in internet health interventions appears to have a significant role. The systematic review by Webb *et al.* (2010) showed that the internet interventions based on theoretical models had significant positive impact on effect sizes; the greater the use of theory the larger the effects compared to less extensive or no theory use. Similarly, the more behaviour change techniques employed the larger the effects on behavioural outcomes than using fewer techniques. However, none of the interventions showed whether particular techniques were more effective than others suggesting that more work

needs to be invested in delineating the individual contribution of each intervention component in behaviour change. In addition, the relationship between theory use and effectiveness has been observational and correlational; experimental demonstration can provide more insight into the nature of such relationship but the research is limited. Overall, the use of internet as a delivery platform for theoretically-based behaviour change interventions can provide tools that match more closely the principles of behaviour change, compared to other static delivery modes such as print-based interventions, e.g. automatically adjusting goal setting based on previous feedback or tailoring messages to previous performance (Norman 2008).

In summary, theoretical models have a significant role in the development and evaluation of an intervention as well as in identifying which specific factors are involved in influencing target behavioural outcomes. Despite the obstacles in disentangling the influence of various variables due to insufficient reporting from many studies, efforts via experimental designs enable to identify which theoretical variables are key factors to the behavioural outcomes.

1.5 The rationale for applying tailoring in the cold and flu-type intervention

One of the challenges of behaviour change interventions is creating and communicating effective health messages to the public that are relevant, informative and ultimately have the greatest potential of influencing behaviour (Noar *et al.*, 2007). A research area attempting to address this challenge is the area of tailored communication. Tailoring is “any combination of strategies and information intended to reach one specific person, based on characteristics that are unique to that person, related to the outcome of interest, and derived from an individual assessment” (Kreuter *et al.*, 2000). Its underlying rationale is that one size does not fit all: there are variations among individuals that uniquely affect each individual’s health-related decisions and behaviours which generic health messages are not able to capture and address. On the other hand, tailoring enables health promoters to select what information to be presented to the individual thus allowing development of messages that are more personally relevant to the individual and meet the individual’s needs.

The above definition highlights the two features of tailored communication: a) it is assessment-based, and b) its messages are individual-focused, which distinguish it from

other approaches to health communication such as generic and personalised. Both generic and personalised messages are developed in a uniform way focusing on a particular health issue and the materials are distributed on a mass scale to a wide audience. Personalised communication adds a level of superficial individualization to the message by inserting a personal identifier, such as the individual's name, to draw attention to an otherwise generic message. This method is commonly used in interventions using mass mailings about acute illnesses (e.g. Hansen 1995; Heaney *et al.*, 2001). Individuals are more likely to pay attention to something that has their name printed on them; nonetheless they still have to sift through redundant information which can adversely affect their interest and their motivation to the content (Kreuter *et al.*, 2000). Overall, the above approaches lack the means to develop individualized strategies in addressing personal needs, concerns, and preferences that could be involved in health behaviour change (Brug *et al.*, 1999; Kreuter *et al.*, 2000) whereas tailoring enables assessment of these individual's characteristics which in turn dictate the level of personal information the reader will subsequently receive.

It appears that the tailored approach shares several similarities with interpersonal or face-to-face communication. Both approaches use similar process and framework: the interaction with the individual starts with the assessment-phase, then proceeds to the data processing stage and finally, feedback is given based on the two previous stages. However, in tailored communication programs both the assessment and feedback are predetermined and prepared in advance thus this method has a defined limit unlike interpersonal interaction where assessment can be based on non-verbal cues as well and feedback is more dynamic in response to open-ended questions. Another point that they differ is the level of interaction: the tailoring technique does not provide the same level of interactivity, intimacy and immediacy of interpersonal communication. However, the underlying rationale of tailoring is not to replace face-to-face or direct counselling but rather to make the messages more personal and immediate to the individual's needs and preferences. Thus tailoring so far is viewed more as complementary to interpersonal communication – it is a powerful tool aiming to enhance the work of health educators, not to replace it.

1.5.1 Why tailoring works

Dual information processing theories, such as the Elaboration Likelihood Model (ELM; Petty and Cacioppo 1981) and the Heuristic-Systematic Model (HSM; Chaiken 1980; 1987), provide valuable insight into how tailoring works. In particular, the ELM has been

commonly used as the theoretical context in explaining the effectiveness of tailored communication over other generic means of communication in influencing health behaviour (Kreuter *et al.* 1999). Although the model was not developed specifically to explain tailoring, it discusses how messages can be manipulated and presented to the individual based on personal relevance, the main attribute of tailoring. The HSM posits a similar dual processing system as the ELM, however ELM has received stronger empirical support on tailoring thus it is discussed in further detail below.

The ELM postulates that the individual can engage in two types of information processing: the central and peripheral route processing. The central route of processing is characterized by extensive and careful examination of the message and the arguments presented. This is considered as a rational approach of argument assessment where people make reasoned decisions based on the message arguments, and persuasion is based on thoughtful consideration of the issues addressed. Central processing usually occurs when issue involvement, motivation, and ability to process are high. On the other hand, the peripheral route is characterized by a reliance on cues that are irrelevant or unrelated to the arguments contained within a message, e.g. appealing presentation of the message, identification with the source of the message (Petty and Cacioppo 1986). This kind of processing often functions when motivation and/or ability to process messages are low. Information presented that is of little relevance to the individual leads to attitudinal changes that are relatively short-lived. Enduring attitude change depends on the likelihood that an issue or argument will be elaborated upon or thought about. Messages that are tailored and customized to the individual's personal needs are more likely to capture the person's attention and increase the likelihood to be viewed as personally relevant, to be processed more thoughtfully and increase persuasion (Skinner *et al.*, 1999; Vandelanotte and Bourdeaudhuij 2003) i.e. they activate central processing.

Kreuter *et al.* (1999) outlined, in a five-step sequence, the use of the tailored approach to health communication, as inferred from the ELM principles:

- a) The tailoring of information eliminates superfluous information
- b) The remaining information is more personally relevant to the recipient
- c) People attend more the information they perceive as personally relevant
- d) Relevant information that is attended to is more likely to influence the factors related to behaviour change.

- e) The relevant information, when attended to and thoughtfully processed, will be more useful, than non-tailored information, in helping the person to enact the desired behavioural changes

A number of studies have provided evidence for the above principles where tailored messages, compared to non-tailored information, are more likely to be read, understood, recalled, and perceived as credible (Brug *et al.*, 1996; Brug *et al.*, 1998; Rimer *et al.*, 2001). Although these changes do not necessarily explain changes in health-related behaviours, it is reasonable to expect that personally relevant information is more likely to stimulate thoughtful and thorough consideration of a proposed behaviour change. When the person's attention is captured and elaboration begins, health messages are more likely to stimulate important pre-behavioural changes such as intention to try the behavioural recommendations (Kreuter *et al.*, 1999; Kreuter *et al.*, 2000).

1.5.2 The effectiveness of tailoring

Tailoring has been applied in various health behaviour change programs ranging from smoking cessation (Stretcher *et al.* 1994; Dijkstra *et al.* 1998; Stretcher *et al.* 2005), nutrition and physical activity (Brug *et al.*, 1999; Bull *et al.*, 1999) to binge drinking (Chiauzzi *et al.*, 2005), and mammography screening (Rimer *et al.*, 2001; Saywell *et al.*, 2004). However, very little work has linked tailored information to primary care outcomes such as consultation behaviour and antibiotic prescribing. Specifically, there have been two studies claiming to provide tailored advice for minor illnesses (Plass *et al.*, 2005) and for specific respiratory tract infections such as acute cough (Coenen *et al.*, 2004). Both studies though provided generic in-print information along with face-to-face advice offering explanations and answering questions about the paper-based information. Thus, the information provided was tailored only within the context of face-to-face interaction rather than providing tailored information without interpersonal communication (Kreuter *et al.*, 2000).

The effectiveness of tailoring is hard to interpret when the comparison group is a no treatment control as it makes it difficult to assess whether the outcome is due to the effect of tailoring or some other intervening factor such as the mere giving of information. A significant body of work on tailoring though has examined whether receiving tailored messages leads to better behavioural outcomes compared to generic or group-targeted

materials. Individual studies and narrative reviews showed a general pattern towards positive behavioural outcomes (Kreuter *et al.*, 2000; Skinner *et al.*, 2003), participant recall and satisfaction with the tailored materials (Brug *et al.*, 1996; Kreuter and Wray 2003), paying more attention to the health messages and viewing them as more personally relevant (Ruiter *et al.*, 2006) than non-tailored messages. However, the earlier narrative reviews lacked a systematic and thorough search of the literature in assessing the above outcomes and were not consistent in reporting the criteria used in judging the effectiveness of the interventions. Noar *et al.* (2007) addressed these shortcomings in a meta-analytic review of 57 studies of tailored print messages. The majority of the studies (38 studies) focused on preventive behaviours such as smoking cessation, exercise and diet whereas the remaining focused on screening behaviour such as cervical cancer screening, and immunization behaviour. The review showed that tailored communication had an advantage over interventions providing non-tailored information with an odds ratio of 1.21. The authors went further to explore a range of possible moderators which showed that studies having repeated contacts with the target population, and providing frequent feedback had greater effect sizes than studies providing a one-off feedback; studies using pamphlets or leaflets had the largest effect sizes compared to studies using manuals or booklets. One explanation for the latter may be the length of the materials, the longer the materials the less likely to be read by the users. Another moderating factor was the inclusion of theoretical concepts in the intervention. Nearly every study that tailored on theoretical concepts had a larger effect size than those that did not include such tailoring. Most of the studies had a tailoring combination of theoretical and behavioural variables, producing the second largest effect size compared to studies which tailored on theory or behaviour only. The studies that had a tailoring combination of theoretical concepts, behaviour and demographics had the greatest effect size though they were only three studies in this category.

The review also attempted to identify which theoretical concepts have the greatest effect size to form the base for tailoring by comparing the presence or absence of individual theoretical concepts in each study. The bivariate analysis of the review highlighted that tailoring psychosocial constructs related to health behaviour, such as self-efficacy and attitudes towards the target behaviour, enhance the effectiveness of the intervention and provide a fruitful conceptual basis to build the intervention.

1.5.3 Advancing the technique of tailoring

The great majority of research on tailoring so far has been done with print communication and as its effectiveness becomes more established, the adoption of a web-based approach in delivering tailored interventions creates the potential for additional benefits such as reduced cost and broader dissemination of the information (Cowdery *et al.*, 2002). The use of internet-based applications enables researchers to create programs that can automate the collection of a large amount of personal information, support a complex level of tailoring on a variety of factors that influence behaviour, and provide individualized feedback that in most cases, in the past, could only be achieved through face-to-face interactions with health care providers. The advance of digital technology comprises a range of modalities to select from, e.g. computer, mobile phone, television, via which to present the tailored information. The flexibility to operate within a range of modalities can enhance the user's understanding of the material, facilitate the timely delivery of messages as well as ensure the users progress through the program particularly when it is scheduled to send multiple messages during the duration of the program (Lustria *et al.*, 2009).

The application of computer-internet tailored interventions over the internet is at early stages, both in research and real-life settings (Suggs and McIntyre 2009). Nonetheless, there are some studies delivering tailored messages via such medium and as the systematic review by Webb *et al.* (2010) showed, looking at internet interventions promoting health behaviour change, the studies delivering automated tailored messages had significantly greater effects on behaviour change than non-tailored interventions. However, there is great variability amongst studies on how they assess individuals in creating and delivering the individualized health messages, and keeping the users engaged with the program (Lustria *et al.*, 2009). It is not surprising then to see a repeated call in recent papers to move the discussion from the question 'does tailoring work' to 'why and how does tailoring work', i.e. to identify the ingredients that contribute into the effectiveness of tailoring (Hawkins *et al.*, 2008; Bennett and Glasgow 2009; Lustria *et al.*, 2009).

Summary

Tailoring is a communication method designing messages that take into account the needs and preferences of the recipient thus creating significant advantage over more traditional methods such as generic methods. The ELM provides a useful explanatory framework of why tailoring can have more impact than other communication methods. Tailored

messages contain information that it is more personally relevant attracting more attention thus they are more likely to be centrally processed i.e. thoughtful examination of the messages and more likely to stimulate important pre-behavioural changes such as intention to act on behavioural recommendations. Although tailoring has not been applied in the area of consultation and supporting health user's decision-making in primary care the evidence from other behavioural areas is promising. This is enhanced with the use of internet as a delivery mode where its range of features provides more means to achieve the results on health behaviour change outcomes.

1.6 Summary

The thesis of this research describes the development of a theory web-based intervention, aiming to empower individuals of the general adult population in their decision-making on what to do when experiencing ARTI and encourage medically appropriate use of primary care consultation time. This chapter presented the rationale and the approach adopted for this intervention and in particular, it explained the reasons for focusing on these conditions; why the internet was chosen as the platform to deliver the intervention; the reasons of including theory in the development of the intervention; and finally the rationale of applying tailoring on the health messages and advice.

As one of the aims of the intervention is to provide information that could encourage medically appropriate use of GP consultations, the next chapter looks in detail the reasons of why people seek professional help when they experience ARTI and generally minor infections.

Chapter 2 Why do people seek professional help for respiratory tract infections?

2.1 Aims of this chapter

This chapter analyses and discusses the factors underpinning peoples' decisions to seek professional help for their respiratory tract infections by drawing evidence from quantitative and qualitative studies.

The chapter is split into 3 sections. The first section explores how people try to make sense of their symptoms and the impact these can have on their health and everyday life. The second section discusses how people react when they experience one or more ARTI symptoms, or generally minor ailments, and the factors influencing their decision to see their doctor for help. The third and final section investigates whether such behaviour could be explained within certain theoretical frameworks and identifies the theoretical components linked to behaviour change that could be addressed in the development of the web intervention.

The literature was identified by searching the databases of EMBASE, MEDLINE, PsycInfo, and CINAHL with MeSH words or combination of keywords and MeSH words: consultation, attendance, visits, primary care, antibiotic prescribing, qualitative, quantitative, minor ailments, cough, sore throat, acute respiratory infections. In addition, the references of relevant articles were searched as well as the search options of 'cited by' and 'related articles' provided by Google scholar.

2.2 The experience of being unwell and the impact of symptoms

People seem to hold their own individual views of when someone is healthy or unwell. They use their past experiences to make sense of their current situation when they experience various symptoms and subsequently inform their actions and decisions regarding how to best cope with such symptoms. Cornford (1998) interviewed a group of adult patients that consulted their GP for their cough and compared their experiences with a group of people who also recently experienced a cough and had not consulted. The consulting patients felt that their cough was abnormal: their pre-existing experiences and knowledge of 'what a cough is and feels like' were not congruent with their current experience: the duration and the impact on their physical health was something they had

not experienced before compared to non-consulting patients, who felt that their cough had no abnormal characteristics.

Individuals' personal understanding, or models, of health and illness are core when they experience self-limiting symptoms themselves or provide care to others, as it provides the framework which guides their efforts how to cope as well as their assessment of the outcome of such decision-making. Equally important, these models are not static: they evolve and new experiences of illness provide new elements that are incorporated into the existing model (Jonsson and Haraldsson 2002). In a qualitative study, Irvine and Cunningham-Burley (1991) interviewed a group of mothers of young children, about their views to childhood health and how they went about dealing with the various acute illnesses their children faced. Their understanding and assessment of being healthy and unwell was based on their unique knowledge of their child and a function of the developmental stage of the child.

Individuals use their past experiences and existing knowledge to define their symptoms, as Everitt et al. (2003) has shown in one-to-one interviews on peoples' perceptions of acute infective conjunctivitis. Participants were aware of their condition and its acute nature, however, their personal model for the particular illness seemed incomplete as they had little knowledge of the self-limiting nature of the condition and consequently a strong belief in the need for an antibiotic prescription to clear it up.

People also hold relevant beliefs concerning the possible cause(s) of the particular condition however there is no evidence whether this influences or is related to their decision to seek professional help. Jonsson and Haraldsson (2002) explored the beliefs and feelings of parents of children with newly diagnosed acute otitis media. The parents believed the condition was caused by either a failure in the mechanism of the body or brought on by environmental factors e.g. exposure to cold weather. However, the authors did not show how these beliefs could be linked to parent's apprehension about the use of antibiotics, the majority believing they are causing harm to the body and creating resistance. In addition, there was no clear suggestion of the possible factors that made parents seek professional help in the first place. There was some tentative indication that although parents did not consider the disease as a threat, they worried about the short- or

long-term loss of hearing and the possibility that it was something more serious than ear infection.

There was misinformation about the primary cause of the common cold amongst adults and adults caring from their children who sought help from a GP: 42% believed that both virus and bacteria caused their symptoms (Braun *et al.*, 2000) and although the great majority believed in the effectiveness of self-care, a considerable number of participants believed in the effectiveness of using prescribed medication for their treatment.

The impact of symptoms on everyday life seem to affect how one reacts to the symptoms; anything out of the normal routine could be interpreted as a precursor to illness, as an illness itself or as a problem for the family (Irvine and Cunningham-Burley 1991).

Atypical symptoms with significant impact on people's social roles at work and home induced anxiety (Cantrill *et al.*, 2006) particularly about the possible cause (which was viewed as potentially life threatening such as tuberculosis) as well as about the possible consequences such as chest damage (Cornford *et al.*, 1993; Cornford 1998). In Everitt *et al.* (2003), parents felt that if acute infective conjunctivitis was left untreated, it would damage the eye and increase school absences. More importantly, their strong belief in the need for treatment to clear up the infection, in particular antibiotics as shown above, contributed to their decision to seek professional help. Past family health problems, although sometimes unrelated, often exacerbated such worry, especially for people with pre-existing health episodes.

People are particularly overwhelmed when their children experience respiratory illness or other minor ailments. Kai (1996), in one-to-one interviews and focus groups, invited parents of preschool children (under 5) from a disadvantaged inner city community to participate in a discussion about what worries parents when their children are acutely ill. Parents felt disempowered when faced with acute illness in their children and found it difficult to make sense of such conditions. They were concerned by specific symptoms such as fever and cough, especially when not accompanied by other common signs of illness such as a cold. Their personal health model warned them that this might be an indication of a threatening situation such as meningitis and made them more vigilant. Their increased awareness was further supported by media campaigns which in turn made them feel more anxious and concerned; for example, they tended to interpret all types of rash as

an indication of meningitis. These findings contrast Jonsson and Haraldsson (2002) above, where parents were aware that complications of acute otitis media are becoming rare. However, a caution should be noted for a direct comparison between the two studies as there was no information about the social characteristics of the group in the latter study and the views expressed in Kai addressed a range of minor ailments which may differ in duration, complications and the attached meanings to acute otitis media.

2.3 Coping with minor ailments

People routinely try to restore their health status by trying various coping strategies.

2.3.1 Self-care

For many people, self-management and monitoring of symptoms are important in reducing the threat of harm and help them to feel being in control of the situation. A considerable number of illness in the community is dealt with without professional intervention and this concept has been described as 'symptom iceberg' (Hannay 1979). Thus health professionals only see a small proportion of the actual conditions and illnesses people go through. Gray et al. (2002), using focus groups and in-depth one-to-one interviews, explored the use of health information channels for the management of MA among young people. The authors argued that individuals can develop a dynamic health repertory, similar to schemas, about management of MA. Lay knowledge and action are developed over time and used when needed, thus when experiencing symptoms they had before, they draw from their existing knowledge to inform their action; the new symptoms are interpreted against the context of their existing knowledge as well as seeking for new information. This gradual building of experience over time on what to do was also evident in the interview accounts, in Cunningham-Burley and Irvine (1987), investigating how mothers routinely coped with MA in their children. They showed that mothers gradually learn to treat MA themselves, using proprietary medication as well as home remedies.

The use of over-the-counter (OTC) medication is one of the most popular self-care methods. Hassell et al. (1998) argued that most individuals visit the pharmacy for a specific medicine to treat symptoms that they have already diagnosed. Johnson and Helman (2004) examined lay beliefs about OTC medication and showed that some people appeared to believe they could shorten or cure their cough and cold symptoms. The use of OTC medication was underlined by an expectation of quick relief as they felt they could

hasten recovery, however, if symptoms persisted then their next step would be to seek medical consultation in order to get something stronger. Similar findings were found by Cornford (1998) where patients if had already tried to self-care with no effect, their next likely step was seeing the GP for antibiotics.

2.3.2 Social network

The social network has a major role in people's decision-making concerning self-care and seeing the doctor. Freidson (1970) argued that lay referral networks can have considerable influence on people's interpretation for their symptoms and on whether or not they seek help. Scambler and Scambler (1981) examined the relationship between social networks and use of primary care services in a group of women; it was found that the majority of symptoms that led to consultations were discussed with a lay person beforehand and with an average of eleven lay consultations for every medical one.

From the medical sociology research field Pescosolido (1992) proposed a social organisation strategy framework to illustrate how people's decisions for care for their illness are embedded within social interaction; social networks provide the mechanism through which individuals learn about, understand and attempt to handle difficulties. In the face of illness uncertainty, individuals employ various strategies and there is no homogeneity in the pathway to the use or non-use of professional help. For example, married individuals rely heavily on the family for medical advice (a finding congruent to Scambler and Schambler 1981) and are more likely to use the family alone or in combination with physicians. People with higher levels of education are more likely to rely on home remedies in addition to the family and physicians or to rely on the family alone. According to the author, help-seeking strategies are socially organised into embedded strategies but the framework cannot capture the influence of each strategy to the end-decision of seeing the physician or not.

Mothers appear to be a frequent information source of what needs to be done (Gray 2002) providing advice on making sense of the illness and coping with it, self-treatment and whether a general practitioner should be consulted. But as individuals get older their expertise develops and may include other information channels such as use of health information, OTC medication advertising, medical consultations and use of OTC medication. Coons and McGhan (1988) argued that an individual's experiential knowledge

and the health information or advice from family and friends are the most important factors in the initial stages of the illness model. This is particularly the case where the patients are young children. In Kai (1996), when parents felt unable to recognise a health problem they often sought help and advice from their family and social network, which in turn advised them to seek medical help as in Jonsson and Helman 2004. Similar findings were found by Scambler and Scambler (1981) above where large kinship networks (comprising more than four people) were associated with more consultations.

2.3.3 Seeking professional help

As shown above, the decision to consult a doctor is not an automatic response to a symptom experience but seems to be one of the many coping strategies people use. A minority of people seek professional help and many studies argue that such consultations carry the expectation that the patient seeks for a prescription and that the doctor will provide one, particularly if self-care has already been tried with no effect on symptoms.

However, there is consistent evidence from various types of minor infections that indicate that people go through a process of assessing their symptoms, decide on the best action, go through reassessment again and act again if necessary (Leydon *et al.*, 2009)). Thus people are not thoughtless users of health services but their decision is based on thoughtful thinking and a complex mix of social, psychological and medical factors (Braunack-Meyer and Avers 2009). Consequently, their decision to seek help is not solely based on the frequency and the severity of their symptoms.

2.3.3.1 Getting a prescription?

Pre-existing knowledge and ideas of what they have and possibly about the best treatment that will benefit them are central in peoples' subsequent decisions. In the Cornford (1998) study, non-consulting participants felt that their cough had no abnormal characteristics and felt no reason seeing professional help. Furthermore, their decision was influenced by their belief that they would not be given a prescription, indicating their expectations when seeing the doctor and their knowledge of the consultation outcome.

There is a wealth of literature investigating the relationship between patients' knowledge of managing MA and their health service use and more specifically antibiotic demand and

prescription for their symptoms. One of the dominant assumptions of this work is that misconceptions in people's knowledge are linked with high health service use, a proportion of which could be inappropriate. In turn, this is linked to high demand for antibiotic prescriptions which contribute to growing concerns over the emergence of antibiotic-resistant organisms in the community and to huge financial costs (Davey *et al.*, 1996; Dowell and Schwartz 1997; Lee *et al.*, 2003). In addition, concerns for antibiotic prescription misuse for various MA such as upper respiratory infections (e.g. acute bronchitis, sore throats) are heightened due to evidence of their limited effectiveness (McCaig and Hughes 1995; Gonzales *et al.*, 2000; Gonzales *et al.*, 2001).

Chan (1996), in a survey of private practices in Hong Kong among people (adults and guardians) seeing their doctor for upper respiratory infections, showed that more than half of the participants believed that their condition was bacterial-related and the majority felt it could only be resolved by seeing the doctor for a fast recovery although less than half actually were visiting to get an antibiotic prescription.

Jonsson and Haraldsson (2002) argued there is a transaction between the patient's and the physician's explanatory model of the interpretation of the symptoms and the need to be treated. Similar to the study by Chan above, parents favoured the use of antibiotics if they believed that bacteria were the cause of the disease. Furthermore, the belief for the need of antibiotics was positively related to the severity and impact of the condition. Although they seemed to acknowledge the self-limiting nature of most conditions and of the low incidence of complications of acute otitis media, the worse the symptoms were the higher the expectations for antibiotics being the best treatment/cure for their child.

The increased antibiotic prescription is linked to patient's expectations when coming to the consultation room and their influence over the doctors' decisions for the recommended treatment. However, various studies have shown that the GPs' perceptions of patients expectations for antibiotic prescription is not in line with patients' actual expectations and this mismatch has been made clearer through accounts from both the patients and the GPs. Barden *et al.* (1998) holding separate focus groups with GPs and parents, have shown that GPs predominantly quoted parental expectations in antibiotic prescribing for treating upper respiratory infections although they acknowledged that such demands were changing due to greater media reporting over the possible harmful effects of antibiotic overuse. They

also mentioned other factors such as desire by both GPs and parents for a quick-fix, ending the consultation quickly, increasing patient satisfaction and preventing possible recurrence and worsening of the symptoms. On the other hand, parents overall did not expect antibiotics but rather the doctor to suggest the most appropriate treatment. However, there were some that they believed that antibiotics could provide a quick treatment and preventing recurrence especially if they had to go back to work and previous self-care was not effective. They argued that they would be satisfied if were given an explanation when prescription was not appropriate, being listened to and their questions being answered; their satisfaction was associated with the responsiveness of the doctor to their concerns. Thus, health care professionals mainly attributed responsibility to parents for inappropriate prescribing but parents' accounts showed that there were more complex issues influencing their behaviour: seeking guidance, evaluation of health state and getting reassurance. In brief individual interviews with GPs and patients recently consulting for sore throat or upper respiratory tract infection, Butler et al. (1998) aimed to answer the same question as the previous study. GPs in this group, as the above, quoted that most patients expected antibiotics as they 'wanted something to be done' when visiting them. GPs recognised that a lot of the times the prescribing was irrational but as they did not want to disappoint their patients, they were unwilling to confront them and possibly compromise their therapeutic relationships. Their main concern was for both the GP and the patient to be satisfied at the end of the consultation even if that meant unnecessary prescribing. A third of the patients had a very clear expectation of getting antibiotics especially if they had particular symptoms whereas the remaining participants mostly quoted reassurance as their main reason for consulting and getting advice on prevention. Those with no high expectations for prescription were satisfied if they were not getting one; they were mostly dissatisfied when there was no explanation for it, not given an alternative they could use or do, no explanation regarding the duration of the symptoms and being rushed during the consultation. Overall, most of the patients did not communicate their needs and expectations to their doctor for a shared decision-making.

A survey in South Korea by Hong-Jun (2004), using a self-reported questionnaire for primary care physicians and pharmacists and a telephone interview for parents on antibiotic use for the paediatric common cold, showed similar results: almost three quarters of the physicians reported that they perceived expectations for antibiotics from parents whereas only 2% of the parents reported asking their physicians for an antibiotic

prescription. Most parents wanted an explanation of the symptoms or the physicians' advice. However, the data collection via a telephone interview might have created a desirability bias compared to questionnaire reporting.

The findings from the studies above suggest that people have a range of needs and expectations when they or people close to them are unwell and seek professional help and this is not always linked to an expectation for a prescription. In many instances seeking medical care by patients or carers acts as a way to control the overwhelming emotional reaction people experience when they or their child is unwell and their need to help.

Similar findings are also reflected in studies asking people what they would like to know about their symptoms and get out of a consultation.

2.3.3.2 Getting information?

In some cases, people were unaware of the self-limiting nature of their condition thus they sought professional help. Everitt et al. (2003), in a qualitative study on acute eye conjunctivitis, showed that participants knew how to recognise the symptoms and how to treat them, yet they appreciated having a leaflet that highlighted the self-limiting nature of the infection.

Kai (1996) argued that sharing and communicating information between parents and doctors suggests sharing of uncertainty about the likely cause and the best treatment for the presenting symptoms, something that may not be easy to tolerate by parents. It is unclear whether this will help further parents' knowledge and self-management or create more questions, distress and undermine confidence in health care professionals' judgements. In the above study, parents were asked to suggest how health information could be best presented. Unanimously, parents wanted the information to be accessible e.g. illustrated booklet with photos and videos and be shown in discussion with a professional (doctor, health visitor, practice nurse). It would contain simple information free of jargon yet not omitting important technical information and these could be given in particular places such as at antenatal clinics in general practice, baby clinics and toddler groups.

Related to the expectations and the knowledge about the appropriateness of antibiotics discussed in the previous section, there is evidence that individuals seem to agree with the sensitive use of antibiotics for symptoms related to upper respiratory tract infections. However, there is confusion over the distinction between viral and bacterial infections and for which antibiotics work best. In addition, some parents felt the disadvantages of antibiotic use arise not from their use for inappropriate causes but from their frequency of use – harming their child’s immunity to future illness or becoming resistant to the effects of the antibiotic (Kai 1996). As Cornford (1998) showed, explanations given by GPs for the non-use of antibiotics for ‘viral’ causes may not be very clear and adequate. Belief in bacteria as the cause of the disease was associated with favouring use of antibiotics.

Participants expressed their need for more specific and practical advice and not just information about symptom management. They wanted to know more about: the likely cause of the symptoms; the nature of viral illness and how they could assess severity; when it is most appropriate to seek advice (as they did not want to bother the health care staff unnecessarily); the implications of the illness and its treatment; how the OTC and antibiotics work; and if any prevention measures can be taken. They were particularly concerned about some symptoms in their children such as fever and cough, and the possible threatening cause of meningitis. Thus they wanted not just information but reassurance that they were not underestimating the symptoms. Overall, they needed more communication exchange and more equality in their interaction with the clinician, feeling that doctors believe that patients can and should use their judgement about when to seek medical advice but during consultation they expect patients to abandon any claims of expertise and defer to the doctor’s. Participants were conscious of the limited time available during the consultation and lacked the confidence to express their concerns as well as being wary of questioning professionals’ authority.

2.3.3.3 Getting reassurance?

The majority of the studies looking at how people react when they experience MA and how they cope focused on adults as guardians for young family members. They have shown that when young children experience MA, parents often feel distressed and helpless in the face of their child’s suffering, especially when all other things previously tried have not worked. Thus seeking professional help can be reassuring, for example, on whether

symptoms may suggest anything serious or their implications. Such heightened distress is also presented along with the need of people wanting to do something about such symptoms and in some cases having specific things in mind.

Parents were prepared and willing to use antibiotics to deal with their own and their child's distress when faced with MA despite the expressed strong beliefs against the use of antibiotics and their harmful effects on their children's bodies (Jonsson and Haraldsson 2002).

On the other hand, Cunningham-Burley and Irvine (1987) looking at a similar sample, mothers' perceptions of their children's illnesses, showed that participants seldom felt disappointed when they did not get anything at the end of the consultation because they were aware of the limited effectiveness of antibiotics on symptoms such as coughs and colds. They were satisfied when they received reassurance and learnt from advice provided during the consultation. Thus it appears the former group had a specific remedy in mind that could alleviate the heightened distress whereas the latter group were more open to other suggestions from the health care professional. However, it may also be that the former study looked at solely parents' perspectives on a MA (otitis media) and antibiotics whereas the latter study widened the scope of their interview questions including consultations and parents' expectations. In both cases though, the main theme was their need to 'do something' for their children when all other things, e.g. home and OTC remedies, failed.

Similarly, Wang (2003) commented that seeking professional care does not necessarily suggest a need for an antibiotic prescription; people and in particular parents may seek reassurance more than specific treatment thus doctor's perceptions of people's demand may be exaggerated.

The desire 'to act' is also illustrated in Everitt et al. (2003) where parents were expecting to receive an immediate prescription for their children. But upon suggestion from the doctor, they were willing to consider alternative management strategies which were more acceptable to a 'wait and see' approach. Similar findings were shown by Kai (1996), where parents felt that their feelings of disempowerment about their child's symptoms would be best controlled if were able to 'do something about it' rather than wait. However, the encouragement for self-treatment and possibly the recommendation for using OTC

medicines may lead to unrealistic beliefs again if accompanied by an expectation that the symptoms will be cured quickly as was shown by the findings from Johnson and Helman (2004) from using OTC medication. It appears that there is a need to not just emphasize the self-limiting nature of the conditions and the effectiveness of self-care for control of symptoms but also give realistic expectations of their time-duration.

Overall, authors suggested provision of information could address misperceptions about the cause and the consequences of MA and the appropriateness of treatment, especially antibiotics. This could also address parents' distress and subsequent need for reassurance. However, it is unclear how information alone could reduce parents' desire 'to do something' when their child is distressed and they try to maintain their feeling of being in control. From the studies so far, it is emphasized that the individual's personal concerns and needs need to be addressed for both the symptoms and being offered alternative ways available to control them.

As Kai (1996) found, during the consultation parents often felt there was insufficient or imprecise information or explanation of what was wrong, e.g. being told that it was a virus but no further explanation of what that meant, and provoking more anxiety than reassurance. Parents found it difficult to question the doctor's authority and felt puzzled with the problem or silly for overreacting when a diagnosis of a self-limiting illness was given. Their need to actively help their children and regain control over the situation led to the expectation that a potent intervention was needed such as antibiotics, which was not met when they were asked to wait a few more days before seeing the doctor again with no alternative self-help options given.

Therefore, doctors withholding antibiotics when parents have strong beliefs in their suitability and effectiveness for minor symptoms coupled with no provision of adequate reasoning for not recommending them, results in parents feeling that doctors are not listening to them and their concerns are not taken seriously. On the other hand, there is satisfaction when expectations are met, as shown in Everitt et al. (2003): patients described their consultations as normal as expected i.e. being short in duration, with limited information exchange (and no explanation about the self-limiting nature of their condition) and resulting in a prescription i.e. getting a treatment without questions being asked or answered.

In a survey by van Duijn *et al.* (2007), there were significant correlations between those visiting their GP for respiratory symptoms such as cough, sore throat or earache and factors such as being older (over 65), having a chronic respiratory co-morbidity and long duration of symptoms (over 2 weeks). However, being prescribed antibiotics was not related to patients' satisfaction, in contrast to careful physical examination of patients.

Thus based on the above evidence, the majority of individuals seek professional help after they tried addressing the symptoms themselves and the subsequent decision leading them to the doctor is influenced by their need for reassurance and advice on what to do next. There is consistent evidence on various misperceptions people have on the nature of their symptoms, the duration and implications as well as the most effective and quick way to address them.

However, most of the literature is based on studies done with parents caring for their young children, a population that accounts for the highest consultation rates especially if first born (Rogers *et al.*, 1999; Scaife *et al.*, 2000). Thus it may be that adults seeking help for their colds and coughs may have other factors influencing their decision-making or similar factors as the above may have different importance into their final decision.

Another body of literature went further to map the journey people have when they first become unwell, their illness behaviour and the influence to their subsequent decisions and actions. This pathway is defined and explained by theoretical constructs that could further help with understanding of the decision making processes of whether to consult or not as well as identify areas that could inform interventions aiming to facilitate such decisions.

2.4 Psychological theories and seeking medical help

Campbell and Roland (1996) in a literature review exploring the pathways of care and the factors associated with low and high consultation rates, proposed a conceptual framework where the decision to consult was not merely based on the presence or absence of medical problems but rather on a complex interplay of social, psychological and organisational factors. Using data from the 4th National Morbidity Survey in General Practice on various conditions, not exclusively about MA, it was shown that people with certain socioeconomic and family characteristics were associated with higher consultation rates e.g. children, elderly, women, ethnic minority background and from lower socio-economic

class. In addition, decisions about seeking care were explained based on individual psychological characteristics. The latter were interpreted and explained based on the theoretical components of the Health Belief Model (Becker 1974) such as *perceived susceptibility* – high attenders perceiving themselves to be both ill and vulnerable to illness, *perceived severity* – high attendance due to symptom severity, the effect on the individuals lives and their concern about serious disease, *perceived benefits, and costs or barriers from seeking medical care* – high users appear to have greater faith that the doctor's actions will be beneficial and see less barriers, waiting time, in seeking professional help. *Cues to action* can activate health behaviour when appropriate beliefs are held. Cues include a diverse range triggers such as individual perceptions of symptoms, health education campaigns and social influence. Finally, an individual's general health motivation, or 'readiness to be concerned about health matters' (Abraham and Sheeran 2005, p.30) can influence directly the end behavioural outcome. It must be noted that the evidence reported was based on associations and not on causality. Overall, Campbell and O'Roland argued that the resultant pathway of their suggested conceptual framework is determined first by demographic and socioeconomic factors which influence the likelihood of the person getting ill and his/her response to illness. Secondly, the illness beliefs and perceptions (as depicted by the HBM) influence consultant behaviour and then the progress of the illness itself i.e. how it develops and how it responds to self-care. Thirdly, the context of the individual such as social support and lay advice networks, the individual's knowledge and experience of illness. Lastly, actual or perceived barriers such as distance from the surgery and appointment systems influence the demand for primary medical care. Thus, according to the authors, the decision to consult is the result of a complex interplay of social, psychological and physical factors. However, it was not made clear the level of influence of each factor, or group of factors, at each step towards the decision to consult and whether certain factors had more impact than others on the final decision.

Focusing on the individual level and personal illness beliefs, van de Kar et al. (1992) investigated patients' decision to consult their general practitioner by developing a questionnaire based on the constructs of the HBM (figure 1) and asking participants visiting their GP to complete it prior their appointment. The questionnaire included additional constructs on patients' perceptions of their own abilities to cope with the symptom(s) and their need of information about their complaint. Findings showed strong support for the HBM constructs i.e. efficacy of GP care and perceived susceptibility

increased the likelihood of consulting the GP. Additional factors such as need for information and perceptions of efficacy of self-care appeared to contribute significantly in their decision as well as social influences to consult. These findings add to the evidence presented above on the contribution of HBM constructs in explaining consultation behaviour as well as the need of people to seek information during consultation rather for a medical treatment. The significant contribution of perceived efficacy of GP care coupled with the belief in efficacy of self-care has led the authors to suggest that interventions could be developed targeting these constructs where patients are informed about the effectiveness of medical care or self care for specific conditions. However, the study has focused on patients that have consulted their GP whose beliefs may differ from those not consulting e.g. on efficacy of medical care. In addition, no differentiation was made on whether the reason for consultation was for a new, intermittent or chronic condition and subsequently on the level of background experience and knowledge people may already had in influencing their decision to seek professional help. The theoretical conceptualisation of the HBM has also been criticised for not providing clear guidelines how to operationalize the links between the individual constructs in predicting behaviour thus weakening its status as a coherent psychological model in mapping the prerequisites of health behaviour (Harrison *et al.*, 1992). A further criticism of the model concerns the underestimated importance of self-efficacy (Abraham and Sheeran 2005) which appears important in explaining illness behaviour, as seen previously, whereas its other components overlap with constructs proposed by theories such as the Social Cognitive Theory (Bandura 1977) but carrying different name labels (Bandura 2000). In addition, HBM views individuals as rational decision-makers who weigh up their attitudes and values when evaluating the importance of a specific behaviour. For example, by engaging in evaluation of the costs of and benefits from caring cold symptoms either by self-care or seeking medical advice, as the HBM proposes, it views behavioural decisions as static events rather than as dynamic processes that change over time and there is no account of the feedback processes in appraising progress towards or away from a goal (Cameron and Leventhal 2003).

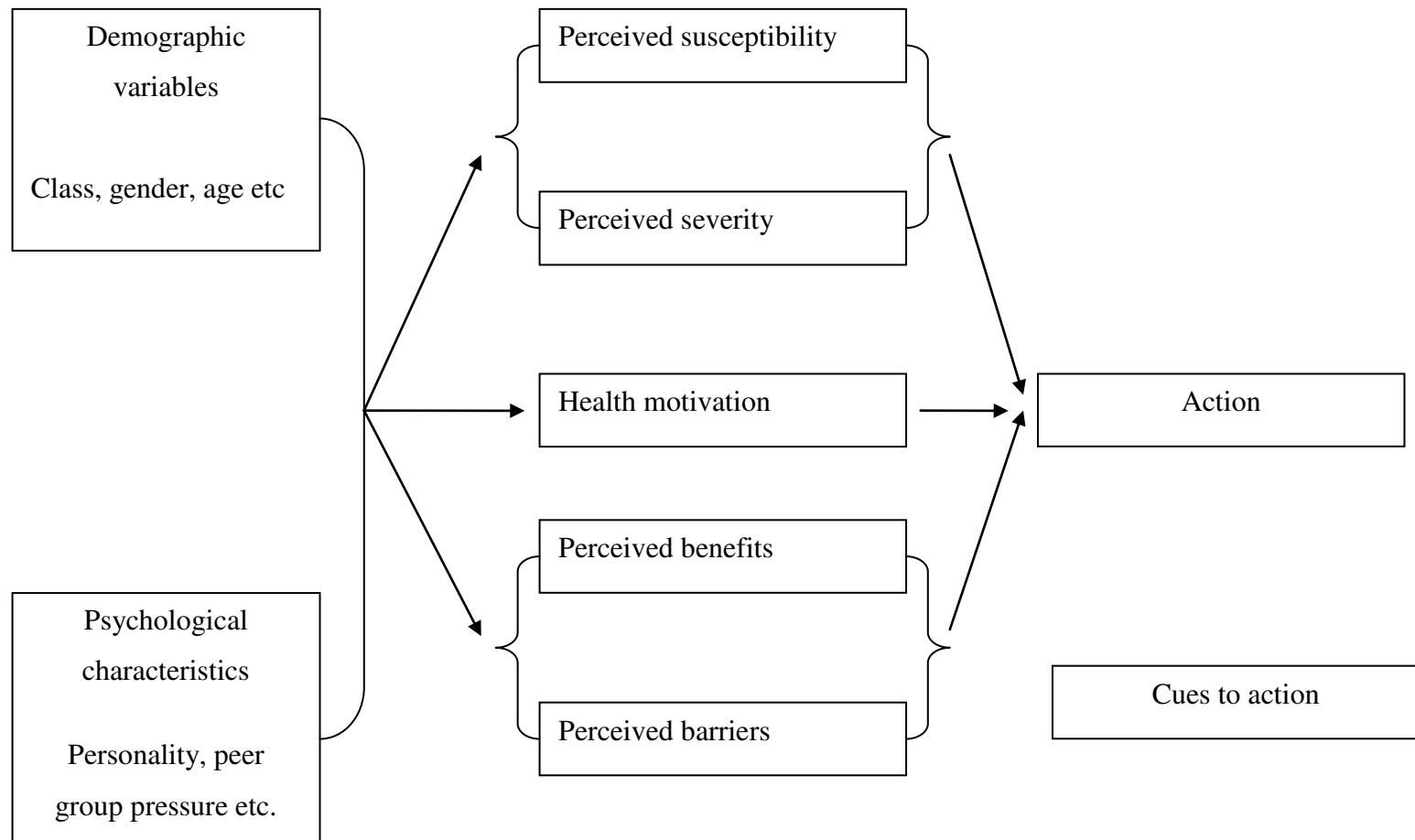


Figure 1 The Health Belief Model

Adapted from Abraham and Sheeran (2005)

Some of the critique of HBM comes from the proponents of two theoretical models widely used in social sciences in explaining health and illness behaviour. These models could provide further explanation of some of the behavioural outcomes and processes arising from the studies discussed in the literature in the earlier sections of this chapter. In particular, the Social Cognitive Theory (SCT; Bandura 1977; 1986; 2000) (figure 2) proposes *self-efficacy* as its central component influencing behaviour. Bandura (1997) define self-efficacy as 'beliefs in one's capabilities to organize and execute the courses of action (pp.3). In other words, self-efficacy refers to beliefs about an individual's ability to perform a specific action required to achieve a desired outcome as well as an ability to perform such action in the context of possible barriers. As van de Kar found above, efficacy for self-care i.e. the belief in own abilities carrying out certain self-care actions, was a significant factor in reducing the likelihood to consult. Behavioural change is made possible by a personal sense of control, so if people believe their actions can solve a problem then they become more inclined to do so. Thus perceived self-efficacy is directly linked to personal control which in turn influences how people feel, think and act (Bandura 1997). Another key construct in SCT is *outcome expectancy* defined as beliefs about the consequences of one's actions. Consequences could include physical and social changes as well as feelings about oneself. As mentioned earlier, people engage in various self-care actions, such as using home remedies or over-the-counter medications, because they believe these will have a positive impact on their symptoms. Therefore, as the theory proposes, both outcome expectancy and self-efficacy are direct predictors of behaviour thus they can have an influential role in adopting new health behaviours or changing existing ones. *Goal setting* and the perception of *socio-structural factors* are two other pathways suggested by SCT through which self-efficacy and outcome expectations operate indirectly. Specific goal setting facilitates subsequent action and guides health behaviour whereas socio-structural factors, such health, political and economic systems, can impede or facilitate the process of change. The SCT constructs are widely used in developing interventions aiming at health behaviour change (Luszczynska and Schwarzer 2005) as they propose a range of techniques which facilitate the implementation of the SCT constructs. These are discussed in detail in the development of the website (chapter 5) with the underlying theoretical rationale of the intervention.

There is considerable evidence supporting the validity in the use of the SCT constructs in developing interventions in a range of health behaviours and populations as well as in

assessing the effectiveness of the intervention (Bandura 1997). However, the construct of self-efficacy has been the most powerful resource factor in predicting the process of behaviour change and subsequently it has received the most research attention (Luszczynska and Schwarzer 2005). For example, it has been shown that perceived self-efficacy is a major instigating force in forming intentions to exercise and maintain it for an extended period of time (e.g. Rogers *et al.*, 2002; Rovniak *et al.*, 2002), in increasing confidence to overcome barriers and predicting attempts to quit smoking (Dijkstra and DeVries 2000), and reducing sexual risk behaviour (O'Leary *et al.*, 2000). In relation to RTI symptoms, the SCT model has been applied to promote GP management of upper respiratory tract infection without prescribing antibiotics. In particular, Hrisos *et al.* (2008) developed two interventions focusing on self-efficacy to increase GPs' beliefs in their capabilities of managing upper RTI without prescribing antibiotics, and anticipated consequences (or outcome expectations) encouraging GPs to consider potential consequences for themselves, their patients and society when managing such symptoms with and without prescribing antibiotics. The interventions led to stronger self-efficacy scores, more positive consequences from not prescribing antibiotics and increased intention not to prescribe.

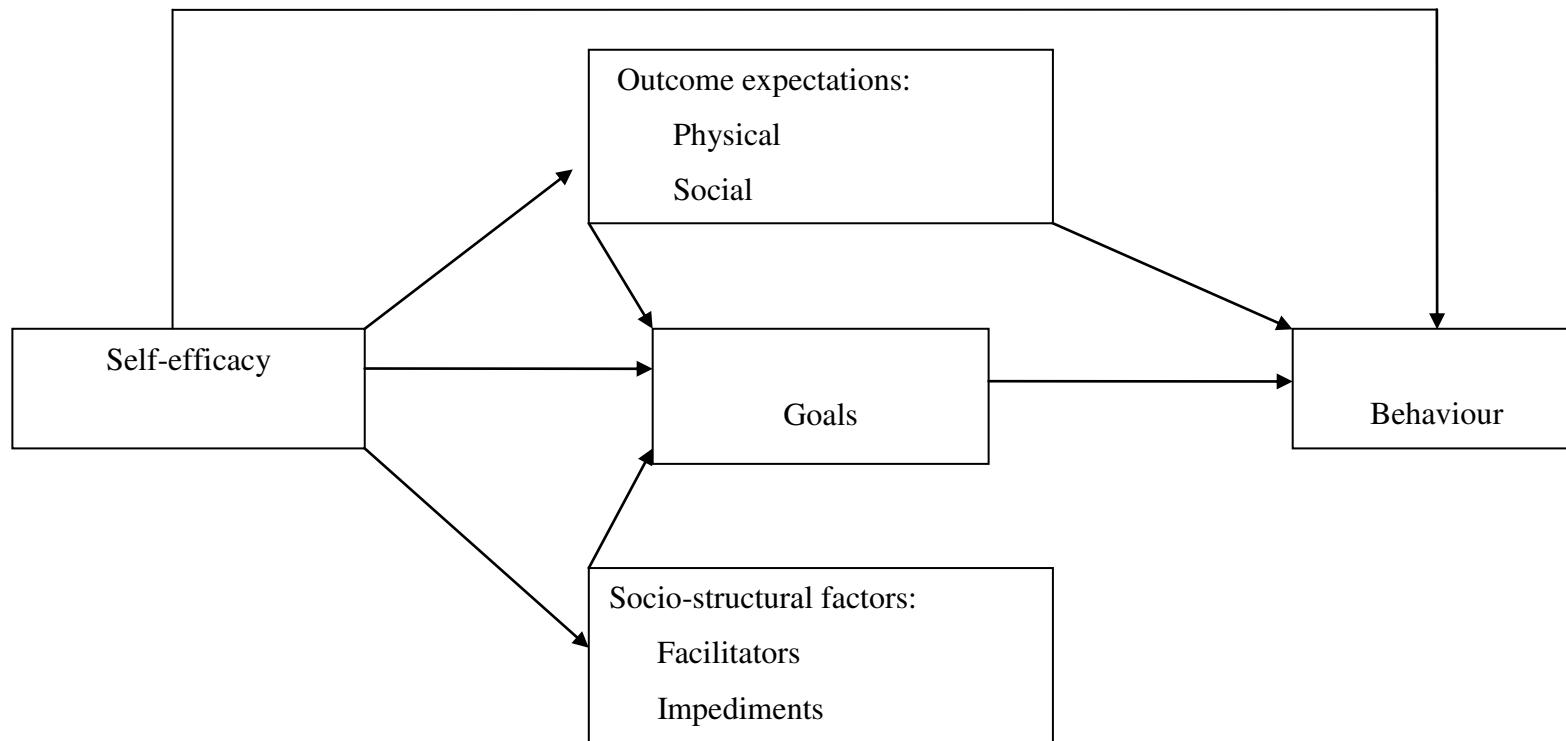


Figure 2 The Social Cognitive Theory

A second model used in explaining health and illness behaviour is the Common Sense Model (CSM; Leventhal, Meyer and Nerenz 1980; Leventhal, Nerenz and Steele 1984; Lau *et al.*, 1989), which describes and explains people's common-sense representations or definitions of health. The basic premise of the model argues that people are active problem solvers thus their understanding of their symptoms and illness guides their coping actions. In turn, the result and the impact of the latter influence their appraisal of the health problem creating a feedback loop.

The model is based on two largely independent processing systems: the first is the cognitive representation of the health problem and the second is the emotional dimension of the problem. Each system route is linked to subsequent coping strategies. The model proposes that illness representation act as a filter of the incoming information about an illness; information about symptoms is interpreted based on the perception or representation of that illness and in turn these direct the coping actions such as self-care, medication taking or seeking medical advice. Most of the research has focused on the cognitive route of the model. Qualitative research suggests that the processing route of the cognitive representation of illness has five major constructs : *a) Identity*: the 'What is it' label, which is associated with the symptoms related to the specific condition; *b) Cause*: how one may get the particular illness; *c) Timeline*: the expected duration of the illness threat: acute, chronic or cyclical; *d) Consequences*: the likely effects of the illness on the physical, social and economic domains of one's life; *e) Control or Cure*: the potential of cure and/or control of the illness (Bauman and Leventhal 1985; Meyer *et al.*, 1985; Croyle and Sande 1988). The five components may arise from an interaction of bodily experiences, past history with illness, health providers as well as from socio-cultural factors although there is little evidence of the underlying processes which may give rise or influence the development of these constructs. Regarding the emotional representation route of illness there is no evidence on whether it comprises similar corresponding constructs as above.

Overall, the CSM model stresses the importance of acknowledging and understanding the illness perceptions, i.e. how an individual views and makes sense of the symptoms, in order to influence subsequent coping actions. The evidence presented in the earlier sections above suggests that the CSM can map and explain some of the illness behaviour and outcomes. For example, the considerable consequences experienced by those who

consulted in the (Cornford 1998) study, led them to seek medical advice. Similarly, people were more likely to seek professional help for their acute eye conjunctivitis if they thought it could cause serious damage to the eye (Everitt *et al.*, 2003) and were more inclined to consult if they believed their symptoms could be due to bacteria (e.g. Hong-Jun 2004).

2.5 Conclusion

The majority of the research evidence presented so far focus on parents caring for their young children and less on adults' behaviour on their healthcare. Considering that parents in general are more likely to seek medical advice for their children rather for themselves, it is difficult to assume that the factors influencing their behaviour could be applicable to both groups. Similarly, conclusions are drawn from studies that, in majority, have looked at a wide range of MA but few of them focused on acute respiratory infections and specifically colds and coughs. Therefore, developing an intervention by drawing inferences from findings of possibly similar but not the actual symptoms of interest may potentially miss important issues or misrepresent others.

Research so far suggests that consultations can serve multiple purposes when people seek help. A few theoretical frameworks have been proposed to explain the underlying behavioural processes in order to help clarify what areas could be targeted by interventions. However, there is little evidence to support their proposed pathways and how their components influence illness behaviour. Subsequently, it is not clear *what* constructs interventions could target to influence behaviour change and *how* such changes could be implemented. Two established theoretical models, the CSM and SCT, used in a wide range of illness behaviour research, provide robust frameworks and constructs that could map and explain some of the underlying rationale that lead people to consult for colds as well as suggest specific techniques that could translate theoretical components into practice .

The next chapter presents the systematic review of the thesis; the review aims to assess the effectiveness of various interventions that address minor ailments and aim to improve outcomes such as self-management, physical health and health service use.

Chapter 3 Health education interventions for minor ailments: a systematic review

3.1 Aims of this chapter

A number of health education interventions have been developed targeting primary medical care users acknowledging the significant impact consultations, related to acute respiratory tract infections (ARTI) and minor ailments in general, could have on health services.

However, a comparison regarding the effectiveness of such methods is difficult partly due to the variability of target outcomes (e.g. acquisition of knowledge and self-care skills, demand on health services, satisfaction with care) and the range of factors that may potentially moderate the effectiveness of the intervention (e.g. setting and delivery methods of the intervention, format of the material, context, source). In addition, as most interventions in this area aim to change behaviour, a growing body of literature argues that such interventions are likely to work best if grounded in empirically-based theories that aim to explain health behaviour change (Michie and Abraham 2004a).

There is evidence indicating a close association between theory use and intervention effectiveness (Noar *et al.*, 2009; Webb *et al.*, 2010) and as already discussed in chapter 1, theories can provide an explanation of what works and the mechanisms involved in behaviour change. Thus theoretical models can potentially identify and map the factors involved in influencing behavioural outcomes which can then be applied and tested in other populations and/or behavioural outcomes.

This chapter presents and discusses the findings of the current systematic review aiming:

- To determine the effectiveness of health educational material addressing minor ailments including ARTI symptoms, as a single or as a part of a multiple intervention, in improving outcomes such as health service use and physical health, psychological outcomes and financial costs.
- To explore whether the characteristics of health education (e.g. the status of the person delivering the intervention, the circumstances, the format of delivery, focus, setting) can influence outcomes.

- To identify which theoretical constructs and/or assumptions were used, if any, to inform the development and/or evaluation of the interventions.

3.2 Method

The review followed the guidelines by the Cochrane Review Handbook for Systematic Reviews of Interventions. These included the search and study selection process, data extraction, analysis and synthesis.

3.2.1 Criteria for considering studies for this review

The following criteria have been set for each of the following sections:

3.2.2 Type of studies

Studies were included if they were randomised controlled trials (RCTs) and there was random assignment of participants to intervention and control groups.

3.2.2.1 Type of participants

People that might or might not have experienced one or more symptoms associated with minor acute conditions at the time of the intervention. This included people (adults, adolescents, parents of young children) recruited from the following settings: primary care; community; pharmacies. Studies were excluded if they addressed in-patients, health care professionals, and individuals experiencing symptoms for more than six weeks and/or being diagnosed with a chronic form of their presenting symptoms.

3.2.2.2 Types of interventions

The review included studies in which (at least) one of the intervention arms consisted of health information on ARTI or minor ailments (MA) given to health-service users.

An intervention of health information was defined as one that could include information, behavioural instructions or advice on acute symptoms, ways to self-care and/or monitoring progress (e.g. if getting worse and when to contact the doctor). This could be done by means of written (e.g. booklets, leaflets, pamphlets), audio-taped, video, mobile or

computer-aided modalities, prepared by individuals or organisations involved in healthcare (e.g. doctors, consumer groups, charities) and provided typically but not exclusively by a healthcare professional. Interventions providing information by means of verbal advice within an interactive live setting only, e.g. face-to-face consultation, were excluded.

Studies with a single intervention were included if they made the following comparisons:

- a) Provision of health information vs. no intervention
- b) Provision of health information vs. health information on other symptoms and/or conditions (e.g. injury)
- c) Provision of health information vs. verbal advice

Studies with multiple interventions were included if they made the following comparisons:

- d) Provision of health information vs. multiple interventions that included health information (e.g. booklets vs. booklets + verbal advice + telephone support)
- e) Provision of health information as part of a multiple intervention vs. multiple interventions without health information (e.g. booklets + verbal advice + telephone contact vs. verbal advice + telephone contact).

Although comparison category (d) assesses the unique contribution of multiple interventions over and above health information, it also assesses whether health information on its own can be effective as an intervention method without extra components, especially if the latter are more costly and resource-demanding than provision of health information alone.

3.2.2.3 Type of outcome measures

Primary research questions:

- A. Does the provision of health information reduce health service use and improve physical health?

The effect of health information on:

- 1) Initial consultations for MA
- 2) Re-consultations for MA
- 3) General consultations

- 4) Antibiotic prescription and use
- 5) Appropriateness of health care use
- 6) Symptom duration and severity

B. Does the provision of health information improve psychosocial outcomes?

The effect of health information on:

- 7) Knowledge for self-care of MA
- 8) Confidence in self-care management
- 9) Using self-care skills
- 10) Satisfaction with information provided
- 11) Quality of life (general and health-related)
- 12) Anxiety and stress levels

C. Does the provision of health information reduce overall financial costs of health care?

The effect of health information on:

- 13) Primary care costs
- 14) Antibiotic use costs
- 15) Hospital care use costs

Secondary research questions:

D. Are the above outcomes influenced by:

- 16) The format of delivery of health information (i.e. given in person or postal)
- 17) The setting in which the intervention is delivered (i.e. during consultation or posted at home)
- 18) The circumstances under which the intervention is delivered (i.e. whether participants were visiting their GP or not)
- 19) The focus of the health information (i.e. range of MA or a specific category such as acute respiratory symptoms)
- 20) The characteristics of the target population (i.e. adults or parents of young children)
- 21) Theoretical basis of the interventions

3.2.3 Search methods for identification of studies

Database searches were carried out in the Cochrane Central Register of Controlled Trials (CENTRAL; The Cochrane Library 2006, Issue 2); MEDLINE (Ovid; January 1966 to March Week 5 2006); EMBASE (Ovid; January 1980 to 2006 Week 15); the National Research Register for UK ongoing and completed trials (searched between March-May 2006); Web of Science (WoS, 1981-2006), CINAHL (1986-2006); Psychlit and PsycInfo. Additional databases included the Clinical trials register which hosts EU interventional clinical trials, and the ClinicalTrials.gov a registry of US-based clinical studies. Grey literature was sought via primary care conference proceedings, library search databases of dissertations, and personal communication with authors working in this area for possible unpublished work. The searches were limited to the English language.

The following search string of Medical Subject Headings (MESH) terms was used as the basis for the search strategy. The search terms were suggested by the Cochrane Consumers and Communication Review Group and combines terms from the highly sensitive search strategy suggested by (Dickersin *et al.*, 1994) and terms specific to the research questions of this review.

1. (self care or self management or self efficacy or self monitoring)
2. (self adj2 (manage\$ or efficac\$ or care or monitor\$ or program\$ or help))
3. (pamphlet or brochure or leaflet or sheet)
4. SELF CARE/
5. PATIENT EDUCATION/
6. TEACHING MATERIALS
7. RANDOMIZED CONTROLLED TRIAL
8. RANDOMIZED CLINICAL TRIAL
9. RANDOMIZED CONTROLLED TRIALS
10. RANDOM ALLOCATION
11. DOUBLE BLIND METHOD
12. SINGLE BLIND METHOD
13. CLINICAL TRIAL
14. exp CLINICAL TRIALS/
15. (clin\$ adj25 trial\$)
16. ((singl\$ or doubl\$ or trebl\$ or tripl\$) adj25 (blind\$ or mask\$))
17. PLACEBOS
18. placebo\$
19. random\$
20. RESEACH DESIGN

In order to reduce the number of irrelevant articles and make the search strategy more specific, the following terms were added to the above search string and were modified slightly for each database (e.g. use of Medical Subject Heading terms where appropriate):

1. INTERVENTION STUDIES/
2. HEALTH EDUCATION/
3. minor illness.mp
4. ACUTE DISEASE/
5. acute condition\$.mp
6. respiratory tract infections/
7. respiratory tract disease/
8. otitis media/
9. bronchitis/
10. common cold/
11. sore throat/
12. Tonsillitis/
13. laryngitis/
14. pharyngitis/
15. sinusitis/
16. vomiting/
17. headache/
18. cystitis/
19. diarrhea/
20. constipation/
21. conjunctivitis/
22. 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21
23. chronic disease/
24. chronic conditions.mp.
25. diabetes mellitus, Type 1/or diabetes.mp or diabetes mellitus, type 2/ or diabetes mellitus/
26. arthritis, rheumatoid/ or arthritis/
27. coronary heart disease.mp or heart problem\$.mp.
28. fibromyalgia.mp. or fibromyalgia/
29. 23 or 24 or 25 or 26 or 27 or 28
30. 22 not 29

The terms related to the chronic conditions were selected through initial scoping searches to identify which terms accounted for most of the unrelated articles. The list of the minor ailments included above is by no means exhaustive and there might be terms that have been missed. However, a wide range of search terms were used for the initial piloting of the search strategy. These were generated through discussions with other health care professionals, through the terms and indexes used by the most relevant articles retrieved at the beginning and through their reference lists. Keywords used by relevant quantitative and

qualitative studies were also included to further supplement the pilot search strategy. This allowed identifying the most frequently cited terms related to MA thus later focusing down the search strategy.

In addition, the references lists of relevant articles were checked for any further studies, following-up the 'cited by' and 'find similar articles' facilities as well as using the Science Citation Index to trace citations of new articles. In addition, hand- and electronic-searching of the journals with the highest frequency of articles considered in the review was also used to identify further articles (British Medical Journal, British Journal of General Practice, and the Journal of the American Medical Association). Finally, a list of research organisations on consumers' health and information and health education charities (e.g. Developing Patient Partnerships) was obtained from the Cochrane Consumers and Communication Review group and were contacted for information on further published or unpublished studies.

Selection of studies and data abstraction

The titles and the abstracts of the studies were screened by the main researcher, based on the inclusion criteria, to identify potentially relevant studies. The main researcher with another colleague reviewed the full-text of the selected studies to determine final inclusion. Disagreements were discussed and settled with a third researcher. Data were independently extracted from the included studies using a predetermined extraction form containing data on the number of participants randomised to the intervention(s), population, the study setting, what the intervention and control arms included, duration of intervention, outcome information, reporting of power calculation and the availability of the intervention materials. The study authors were contacted when necessary to provide additional information. Disagreements were resolved by discussion with a third researcher; reviewers were not blinded to any aspect of the studies.

The search strategy retrieved in total 3578 titles and after initial checking, these were reduced to 2152 that appeared relevant to the scope of the study. The abstracts were checked for further information and this reduced the number of articles to 823. If it was unclear from the title and the abstract whether or not an article should be included, the full text of that article was obtained and read. Based on the criteria set above for considering eligible studies, the number of articles reduced to 32 and their full text was obtained for

further assessment. Fifteen studies were excluded as they did not meet the inclusion criteria thus the remaining 17 articles (based on 14 trials) were included in the review. As the search took place at the beginning of the thesis, the same process was repeated during February 1st-5th 2014 to identify any further studies related to the review that may have been published since the first search. The updated search identified 11 additional articles: 6 were excluded and the remaining articles (based on 4 trials) were included. In total, 22 articles based on 18 trials were included in the review. The table of 'Characteristics of included studies' (Appendix 1) lists the studies included in the review with relevant information; the table 'Characteristics of excluded studies' (Appendix 2) lists the studies not included in the review and the reasons for their exclusion.

3.2.4 Methodological quality

Two reviewers independently assessed the quality of the included studies based on a framework used in other reviews also targeting behavioural interventions (Andrews *et al.*, 2012; Vodicka *et al.*, 2013) and adapted from the Cochrane Handbook risk of bias tool (Higgins *et al.*, 2011). The criteria included: randomization (description of method), blinding, description of the intervention (content and mode of delivery), exposure to intervention and consistency in delivery, and generalisability (to primary care practice). Each criterion was assessed as having a 'low', 'unclear' or 'high' risk of bias with a justification for each rating; each study was subsequently given an overall judgment of 'low', 'likely', or 'high' risk of bias (Table 1 Quality Assessment). The findings were interpreted based on the overall quality assessments. Any disagreement between the two researchers was resolved with discussion.

3.2.4 Data synthesis

Pooling of the results was not considered as appropriate due to the variability among the trials in their quality assessment, reported information e.g. lack of raw data, assessment of outcomes at different time points and targeting different age groups. In this respect, the synthesis of the findings was based on narrative analysis. Confidence intervals (CI) and mean differences were reported for interventions measuring changes in mean; changes in rates were calculated with odds ratio (OR) with 95% CI for each study outcome. In case raw data were unavailable, mean or proportional differences were presented.

3.3 Results

3.3.1 Description of the included studies

Most of the studies (n=11) focused on a wide range of MA symptoms including vomiting, ear ache, runny nose, diarrhoea; five studies focused exclusively on symptoms related to respiratory tract infections (RTI) such as sore throat and cough. Two studies focused on single symptoms only: acute bronchitis and acute eye conjunctivitis. The majority of the trials came from UK (11), followed by USA (4), Denmark (2) and Sweden (1) and included a total of 33712 participants.

Characteristics of participants:

The majority of the studies addressed parents of young children (Morrell *et al.*, 1980; Rasmussen 1989; Hansen 1990; Usherwood 1991; Hansen 1995; Thomson *et al.*, 1999; Taylor *et al.*, 2005; Alder *et al.*, 2005; Francis *et al.*, 2008; Francis *et al.*, 2009); four studies addressed adults only (Macfarlane *et al.*, 1997a; Little *et al.*, 2001c; Macfarlane *et al.*, 2002; Platts *et al.*, 2005) and the remaining addressed both adults and children (Vickery *et al.*, 1983; Terry and Pheley 1993; Heaney *et al.*, 2001; Little *et al.*, 2005; Everitt *et al.*, 2006)

Characteristics of the interventions:

Health information was in written form in all studies, labelled as leaflets, summary cards, booklets or manuals. Only one study provided information in video in addition to the printed material (Taylor *et al.*, 2003).

The content of the information varied, however the majority of the studies (n=9) used materials that addressed 6-20 symptoms predominantly related to respiratory infections (e.g. sore throat, ear ache, runny nose). Four studies used materials that addressed a wider range of symptoms e.g. gastrointestinal infections, musculoskeletal strains in addition to respiratory infections (Vickery *et al.*, 1983; Heaney *et al.*, 2001; Little *et al.*, 2001c; Platts *et al.*, 2005; Alder *et al.*, 2005)

In some studies the intervention included more than one design of the printed health information either as a separate arm in the trial (to compare the two designs in addition to control (e.g. Platts *et al.*, 2005) or within the same arm (e.g. Alder *et al.* 2005; Vickery *et*

al. 1983). There were also interventions that combined more than one format of health information within the same arm such as video (e.g. Taylor *et al.*, 2003) or verbal advice (e.g. Little *et al.*, 2005). Most control groups received no information (Vickery *et al.*, 1983; Terry and Pheley 1993; Hansen 1995; Everitt 2006) or received some of the information given in the intervention group, such as verbal advice (Macfarlane *et al.*, 2002; Little *et al.*, 2005) whereas others received information on other types of health issues, such as prevention of accidents (Thomson *et al.*, 1999) or nutrition (Alder *et al.*, 2005).

Many of the studies provided inadequate information as to how the intervention was delivered, by whom and if it was endorsed by the GP or the practice. In the studies that provided such clarification, health information was delivered by post (e.g. Terry and Pheley 1993; Heaney *et al.*, 2001; Little *et al.*, 2001c; Alder *et al.*, 2005) or given during consultation visits (e.g. Macfarlane *et al.*, 1997a; Macfarlane *et al.*, 2002; Platts *et al.*, 2005; Everitt *et al.*, 2006) where the material was also endorsed by the GPs. In Taylor *et al.* (2003) materials were first given at the GP practice and participants were shown a video with the GP reinforcing the content of the booklet; the materials were then re-sent by post six weeks and six months later. The interventions in all studies were delivered only once apart from Taylor *et al.* (2003) and Terry and Pheley (1993). Hansen (1995) who posted a series of intervention brochures (each on a different health issue) one each month over a period of seven months. Overall, all the interventions targeted future behaviour change, i.e. consultation and re-consultations, but the studies could be classified under two broad categories: the trials targeting people who were unwell at the time of the intervention, i.e. visiting their GP (Macfarlane *et al.*, 1997a; Macfarlane *et al.*, 2002; Taylor *et al.*, 2003; Little *et al.*, 2005; Platts *et al.*, 2005; Alder *et al.*, 2005; Everitt *et al.*, 2006) and the trials targeting a much broader sample that included both well and unwell individuals (Vickery *et al.*, 1983; Rasmussen 1989; Usherwood 1991; Terry and Pheley 1993; Hansen 1995; Heaney *et al.*, 2001; Little *et al.*, 2001c). However, none of the trials directly compared the two types of when to deliver the intervention to assess possible differences on outcomes.

Follow-up times and assessment tools:

The follow-up evaluation times varied among the trials from the same day receiving the intervention (Alder *et al.*, 2005) to over 12 months. There was some consistency when measuring consultation rates related to the symptoms addressed in the health information, which was at 12 months post intervention (Morrell *et al.*, 1980; Vickery *et al.*, 1983; Terry

and Pheley 1993; Heaney *et al.*, 2001; Little *et al.*, 2001c; Taylor *et al.*, 2005). Usherwood (1991) included the first consultation made within 12 months after the intervention. Similarly, general consultation rates were mostly measured at 12 months (Morrell *et al.*, 1980; Vickery *et al.*, 1983; Heaney *et al.*, 2001; Platts *et al.*, 2005; Taylor *et al.*, 2005) but 6-month intervals were also included as an end point (Hansen 1990; Hansen 1995; Thomson *et al.*, 1999).

Regarding the psychosocial outcomes, only perceived usefulness was measured at 12 months by more than one study (Usherwood 1991; Little *et al.*, 2001c; Platts *et al.*, 2005). The follow-up times of the remaining outcomes varied according to the study duration.

Health care costs were measured at 12 months (Vickery *et al.*, 1983; Terry and Pheley 1993).

The majority of the assessment tools for the outcome measures were not validated. As the consultation rates was the most frequent cited outcome, the primary source of information was the medical notes where the data was collected either by the research or nursing staff using their own templates. Self-reporting by means of questionnaires and diaries was used to measure psychosocial outcomes which were developed for the purpose of the studies (e.g. Usherwood 1991; Hansen 1995; Platts *et al.*, 2005). In studies where outcomes such as beliefs in antibiotics were addressed, the measures ranged from a single item referring to both children and adults (Little *et al.*, 2005; Everitt *et al.*, 2006) to a scale of nine items (Taylor *et al.*, 2003) for parents of young babies (younger than 24 months).

3.3.2 Data Analysis - Primary Research questions

The trials were grouped according to the type of comparison made (as listed in section 3.2.2.2). Within each intervention comparison the results are presented as per the outcome each trial addresses. The authors of the included studies were contacted to obtain further trial data, however this was not possible with all of them as some studies dated many years back. Table 2 presents the studies with each of their outcome as per the five intervention comparisons; the summary of the studies' results are presented in Table 3 (both Tables 2 and 3 are presented at the end of this chapter).

a) Comparison of: Patient health information vs. No intervention

Eleven trials used this comparison method to assess the effectiveness of patient health information. In all trials the control group received nothing or information irrelevant to the participants' health (e.g. the GP surgery's opening hours). In addition, all the trials, apart from Everitt et al. (2006) and Francis et al. (2009) delivered their intervention via post i.e. the information was sent to the target population without prior knowledge from the researchers, or the clinicians involved if any, whether the prospective participants were unwell or not at the time of the intervention with the conditions and symptoms addressed in the intervention.

Outcome: Consultation for minor ailments

Five trials (Vickery et al., 1983; Usherwood 1991; Terry and Pheley 1993; Heaney et al., 2001; Little et al., 2001c) reported data on initial consultations, drawn from the medical notes, for symptoms addressed in their interventions.

Two of the above trials had two intervention arms combined against the control group. Specifically, the trial by Vickery et al. (1983) addressing both adults and children combined two intervention arms (written materials and telephone information service respectively) against the control due to lack of utilization of the telephone service. There was a reduction of consultations for the intervention group, mean difference = 0.31, p=0.01. The second trial by Heaney et al. (2001) used two types of booklets, both addressing a wide range of minor illnesses for both adults and children. Combined against the control group, there was a non-significant reduction of consultations, mean difference = 0.03, 95% CI=-0.17 to 0.10. The authors reported that separate comparisons of each of the booklets with the control group indicated non-significant differences (no statistics reported).

The trial by Little et al. (2001) also had two intervention arms, a booklet (addressing a range of symptoms including ARTI) and a shorter summary card (addressing ARTI only), both targeting adults only. The comparison of the two presentation styles separately against the control group indicated that fewer visits were made for ARTI by participants receiving the summary card, OR=0.67, 95%CI=0.51 to 0.89, p=0.005. There was also reduction in attendance in the booklet group, OR=0.81, 95%CI 0.62-1.07, p=0.14.

The remaining two trials (Usherwood 1991; Terry and Pheley 1993) reported limited statistics to support their findings. Usherwood's (1991) study on children indicated a mean difference =0.184 between the intervention of a series of booklets on various acute symptoms and the control. The results indicated non-significant differences but no exact statistics were reported. The study by Terry and Pheley (1993) indicated that there were less consultations for visits related to cold-symptoms after the distribution of the cold booklet whereas for symptoms such as sore throat and fever the use of services was higher than the control after the distribution of the self-care brochures, $p<0.001$ (no other statistics were reported).

Outcome: Re-consultation for minor ailments

Two studies addressed the outcome of re-consultations for ARTI; in particular, Macfarlane et al. (1997) targeting adults visiting their GP, within a month of their first visit the intervention group consulted less than the control group (14.9% vs. 21.4% respectively, $OR=0.64$, $95\% CI=0.46-0.89$, $p=0.008$). In a clustered-RCT Francis et al. (2009) trained clinicians to use an eight-page booklet with parents during consultation and to encourage parents to take the booklet as a home resource. A follow-up of two weeks indicated no difference on re-consultation rates with the control group (no training of clinicians and no booklet for parents) both at multi-level, $OR=0.75$, $95\% CI=0.41$ to 1.38 , and univariate level, absolute risk reduction 3.3%, $95\% CI=-0.027$ to 0.093 , $p=0.29$.

Outcome: General consultations

Six trials assessed whether the participants consulted their GP for any condition or symptoms regardless whether these were addressed in the intervention (Hansen 1990; Hansen 1995; Heaney et al., 2001; Platts et al., 2005; Usherwood 1991; Vickery et al., 1983). Three studies focused on parents for their children's illnesses (Hansen 1990; Hansen 1995; Usherwood 1991) and two studies on adults and children (Heaney et al., 2001; Vickery et al., 1983).

Two of the three trials targeting parents (Hansen 1990; Hansen 1995) reported significantly lower number of consultations in the intervention group, which received a booklet on a range of symptoms, compared to the control group receiving nothing. In particular, Hansen (1990) reported a mean difference of 0.138; no raw data were available nor p-value was

stated. Similarly, Hansen (1995) reported a mean difference of 0.271 between the two groups with no other statistical details. The third trial focusing on parents, Usherwood (1991) reported a mean difference of consultations of 0.15 which according to the authors it was not significant (no exact p-values were given). All three studies scored as having a likely risk of bias mainly due to the insufficient information regarding the randomization and blinding methods they used.

The two studies targeting both adults and children (Vickery *et al.*, 1983; Heaney *et al.*, 2001) also had mixed results. Vickery *et al.* (1983) showed a mean difference of 0.49 between the intervention group receiving written information (mean = 4.29) and the control receiving nothing (mean = 4.78), $p=0.010$. Heaney *et al.* (2001) on the other hand, indicated no significant differences between the intervention and the control groups, mean difference = 0.14, 95% CI=-0.18 to 0.45, no p-value was reported.

All five aforementioned studies delivered their intervention to participants who were not necessarily unwell at the time of the intervention apart from the sixth trial Platts *et al.* (2005) which distributed the intervention – targeting adults only - during the participants' visit at the consultation. In this study, the authors compared the annual consultation rates between males and females for each of the study arm (control vs. intervention 1 – received the Healthwise book vs. intervention 2 – received the NHS direct book). There were no significant differences among the three study arms for neither women nor men; only the p-values were reported, $p=0.91$ and $p=0.64$ respectively.

Outcome: The effect of health information on the use of self-care skills to manage symptoms

A health diary was given to all participants in Hansen's (1990) study to record their children's' illnesses and their own related illness-behaviour. Self-treatment was defined as a 'home activity in response to illness for the purpose of reducing or treating the symptom' (p148). The number of self-treatments was analysed at the end of the 6-month study period and indicated that the intervention group (written information) had recorded a significantly higher number of self-treatments than the control group (received nothing), 51% and 36% respectively, $p=0.004$; no further statistics were reported.

Platts et al. (2005) assessed the use of the allocated books at 3 and 12-month intervals by self-report questionnaires. At three months, 80% of the control group (received nothing) reported that they had consulted a health-related book and 72% of intervention1 (received the Health-Wise booklet) and 57% of intervention2 (received the NHS Direct health care guide) reported that they had consulted their allocated book and had also taken advice from it. The corresponding figures for the next 9 months were 68%, 82% and 59% respectively. No further statistics were reported. Those in the intervention arms reporting that they consulted their allocated book had also taken advice from them. At 3 months, 69% of those reporting a health problem had consulted their allocated book compared with 49% of those reporting no health problem ($p<0.001$). No figures were given separately for each group. Similar results were obtained after 9 months but no figures were provided.

Outcome: Satisfaction with the information provided

Two trials assessed participants' satisfaction with the information provided. In Everitt et al. (2006) satisfaction was reported as greater by those who received the information leaflets than those who did not ($OR=2.5$, $95\%CI= 1.3-4.5$, $p=0.004$). In Francis' et al. (2009) trial, there was no difference between the intervention and the control group, $OR=1.01$, $95\%CI=0.60$ to 1.68 . The same trial also assessed satisfaction with the consultation as the intervention was implemented in an interactive framework with the clinician, with no difference between the two groups, $OR=0.64$, $95\%CI=0.33$ to 1.22 .

Outcome: the effect of health information on primary care costs

There was only study that addressed the cost of care comparing health information with no information for the control group. Terry and Pheley (1993) examined the cost of care, based on claim forms, between the two groups both separately and in total for pharmacy costs, lab tests and other charges. Total charges for the intervention group ($M=\$460.4$, $SD=\$868.1$) were not significantly higher than the control group ($M=\$468.1$, $SD=\$886.5$), no further statistics were provided. Non-significant differences were also observed between the intervention and the control group for each type of cost individually. However, the study was rated with a likely risk of bias and the outdated cost calculations should draw caution to any conclusion made. A further study addressing the cost of care, by Vickery et al. (1983), is presented later under the fourth type of comparison: Patient health information vs. multiple interventions including health information.

A range of other outcomes were examined by single studies: the *Appropriateness of health care use*, i.e. whether consultation visits were medically justified or not, was assessed by Hansen (1990) based on GP records six months after the intervention. Results showed that appropriate consultations were comparatively high for both the intervention (93%) and the control groups (91%) which were not significantly different (p-value not reported). The same study also assessed the *impact of health information on anxiety*, or worry, as a reason for consulting the GP; significantly more parents in the control group (31%) visited the doctor due to reported worry than the intervention group (19%) $p= 0.0075$. Francis et al. (2009) measured a similar construct i.e. feeling reassured after the consultation but there were no significant differences between the two groups, $OR=0.84$, $95\%CI=0.57$ to 1.25 . In the same trial, participants in the intervention group had lower antibiotic prescriptions at the first consultation, $OR=0.29$, $95\%CI=0.14$ to 0.60 , and fewer antibiotics taken than the control group, $OR=0.35$, $95\%CI= 0.18$ to 0.66 . More individuals in the intervention groups by Little et al. (2001) *expressed confidence in managing their symptoms* (booklet: 32% and summary care: 34%) than the control group (leaflet with surgery opening hours: 12%), $OR=3.60$, $95\%CI=2.54-5.09$, $p<0.001$.

b) Comparison of: Patient health information vs. health information given on other symptoms and/or conditions

Two studies used this intervention comparison to assess the level of antibiotic prescription amongst parents. In Taylor et al. (2005) the intervention group received an educational booklet when seeing the GP and shown a videotape about the judicious use of antibiotics whereas the control group received a pamphlet on prevention of injuries of young children. Twelve months after the study enrolment there was no difference between the intervention and the control group on antibiotic prescription (mean= 2.2 vs. mean=2.5 respectively, mean difference = 0.3, $p=0.23$). In addition, the authors investigated general consultations where there was no difference between the groups after the intervention period (mean= 9.8 vs. mean=9.9, mean difference = 0.1, $p=0.71$) nor for re-consultations for symptoms addressed in the material (mean= 2.8 for both groups). In the study by Alder et al. (2005), the parents of the second intervention group received a pamphlet and a fact sheet with information about antibiotic education whereas the control group received information on nutrition about their children. Receiving antibiotic education did not predict antibiotic prescribing ($OR=0.39$, $95\% CI= 0.08$ to 1.92 , $p=0.25$); there were no details about the

control group and how it differed from the antibiotic education group. The study has risk of bias as likely and had a small sample size for each group (N=20). .

c) Comparison of: Patient health information vs. verbal advice

There were no studies assessing this type of intervention comparison

d) Comparison of: Patient health information vs. multiple interventions including patient health information

There were three studies under this comparison category assessing cost, antibiotic prescription, and appropriateness of health-care use. The trial by Vickery et al. (1983) comprised of four arms including a control group targeting both adults and children. Intervention group 2 (posted written information and telephone support) was merged with intervention group 3 (posted written information only) as the telephone support service was not used at all thus the two interventions were jointly compared against intervention group 1 (written information + telephone support + counselling). Intervention costs were higher for group 1 ($M=\$22.32$) than group 2+3 ($M=\14.70). Estimated savings due to reduced visits were also higher in group 1 ($M=\$76.57$) than in groups 2+3 ($M= 35.51$). In total, the savings, after the intervention costs were deducted, were greater for group 1 ($\$3.43$) than in group 2 ($\2.41) (no p-value was given).

The study by Alder et al. (2005) compared a group of parents receiving antibiotic education for their children between 1-10 years old vs. a group receiving both antibiotic education and training in communication with their child's provider. Neither education alone nor in combination with communication training were significantly related to antibiotic prescription ($OR=0.39$, 95% CI= 0.08 to 1.92, $p=0.25$ and $OR=4.15$, 95% CI=0.43 to 39.81, $p=0.22$ respectively). Finally, Rasmussen (1989) assessed appropriateness of health-care use among mothers of young children up to a year old by mailing a self-care booklet (group 1) and providing self-care face-to-face educational sessions in addition to the booklet (group 2). The authors reported no differences between the two groups, group1= Mean=2.30/SD=0.11 and group 2 = Mean= 2.53/SD=0.08 (no p-value was given).

- e) Comparison of: Patient health information as part of a multiple intervention vs. multiple intervention without patient health information

Four trials (five studies) assessed the unique contribution of health information for minor ailments as part of other means of interventions for a range of outcomes (Thomson *et al.*, 1999; Macfarlane *et al.*, 2002; Thomson *et al.*, 2002; Little *et al.*, 2005; Moore *et al.*, 2009). All studies varied on their target population ranging from babies up to six months (Thomson *et al.*, 1999; 2002) to adults (Macfarlane *et al.*, 2002) and both children and adults (Little *et al.*, 2005; Moore *et al.*, 2009).

Outcome: Re-consultation

Three studies looked at whether people are likely to re-consult for the same symptom as their initial consultation within a month of the first consultation. Macfarlane *et al.* (2002) compared the intervention group (received standard verbal advice and a leaflet on lower respiratory tract symptoms - LRTs e.g. cough) to the control group (standard advice only) and found no significant differences (10.6% and 13.3% respectively, OR=0.77, 95%CI= 0.33 to 1.78, p=0.54). On the other hand, Little *et al.* (2005) found that re-attendance was higher in the intervention group (standard verbal information, advice and leaflet on LRTs) than the control group (standard verbal information and advice) (mean = 0.17 and 0.11 respectively, p=0.02). Both Macfarlane *et al.* (2002) and Little *et al.* (2005) used the same leaflet which was given during the consultation visit. The third study by Moore *et al.* (2009), a follow-up from the trial by Little *et al.* (2005), assessed re-consultations a year after the first consultation (and excluding the first month). The groups were further randomized to one of three prescribing strategies. In terms of the health information provided there was no significant difference between the groups, the incidence rate ratio estimate was 1.27, 95% CI= 0.86 to 1.87, p=0.23.

Outcome: Antibiotic use

Self-reported antibiotic use was assessed two weeks after introducing the intervention by Macfarlane *et al.* (2002) by means of a symptom diary given to participants and telephone contact by a research assistant. Participants from the intervention group were less likely to use the prescription given by their GPs (47%) than the control group (62%) (OR=0.54, 95%CI=0.31 to 0.94, p=0.03). Little *et al.* (2005) assessed antibiotic use 3 weeks after the intervention by means of a self-report questionnaire and a validated daily symptom diary.

There were no differences between the intervention group (leaflet; 55%) and the control group (no leaflet; 57%) in collecting the prescription signed by their GP and use the antibiotics (OR=0.91, 95%CI= 0.65 to 1.27, p=0.58).

Five further outcomes were examined by single studies under this intervention comparison. In particular, Thomson et al. (1999) measured *antibiotic prescription* six months after their intervention; more than half of the consultations resulted in prescriptions with no differences between the groups (intervention 69% and control 65%, OR=1.20, 95%CI=0.91=1.57, p=0.20). The same study assessed *consultation visits* for minor ailments including the conditions addressed in the intervention showing no significant differences on the total number of consultations made (83% intervention vs. 81% control, OR=1.03, 95%CI=0.97 to 1.09, p=0.41). In addition, *the effect of health information on self-care knowledge for minor ailments* was assessed via a questionnaire sent to all mothers asking about the use of and attitudes towards the intervention manual (Thomson et al., 2002). Two statements addressed self-management knowledge ('Baby Check did not help me to know when my baby was unwell' and 'Baby Check helped me to look after the baby at home without asking my doctor or health visitor for advice') with the majority of those reporting using it disagreeing with the first statement (67%) and agreeing with the second statement (42%), no further statistics were given.

Little et al. (2005) examined the effect of health information on *symptom duration and severity* for ARTI as recorded by the participants in validated daily symptom diaries. The duration of cough until seen as very little problem, in days, was not significantly different between the intervention and the control group (mean difference=0.26, 95%CI=-0.66 to 1.18, p=0.58). Similarly, the duration of moderately bad cough did not differ between the two groups (mean difference= 0.20, 95%CI= -1.60 to 2.0, p=0.83) nor the duration of any symptoms (mean difference= -0.03, 95%CI= -1.00 to 0.94, p=0.95). Severity was calculated as the mean item score of all diary symptoms 2-4 days after GP visit and showed no significant difference between the two groups (mean difference = -0.03, 95%CI= -0.20 to 0.15, p=0.77). Finally, the same trial assessed *satisfaction with the information provided* showing that both the intervention and the control groups were very satisfied with the overall management provided by the GP (78% and 76% respectively, OR=0.95, 95%CI=0.87 to 1.04, p=0.24).

None of the trials assessed the effect of health information on the outcomes of quality of life (general and health-related), costs related to antibiotic use and hospital care use.

3.3.3 Data Analysis - Secondary Research questions

None of the trials addressed directly any of the secondary research questions presented earlier in section 3.2.2.3. However, the trials sharing similar characteristics were grouped together to explore indirectly, and through narrative analysis, whether any of the specified features could suggest an association with the outcomes related to consultation behaviour. The grouping of the studies was applied to the research questions related to the format, setting and circumstances of the interventions; the focus of the health information; and the theoretical underpinnings of the interventions. The research question related to the characteristics of the participants was excluded from this narrative as there was no discernible pattern through the indirect comparison to draw any conclusions.

Format, setting and circumstances of interventions

The analysis of the studies based on the format of the health information delivery, the setting and the circumstances under which the intervention was delivered showed that the same studies could be distinguished under all three features within a broader category labelled as interactive vs. non-interactive: whether the effect of interactive delivery of health information (e.g. delivered in person) was superior to non-interactive delivery (e.g. delivered by post). The same categorisation also fell under the two categories mentioned earlier: interventions targeting future behaviour of people that were already unwell and consulted their GP versus interventions targeting the future behaviour of a sample that could have included both well and unwell individuals with symptoms addressed in the interventions with no information whether they sought professional help or not prior the intervention.

There was some variability within the interventions using face-to-face interaction: some of them included verbal advice or reinforcement in addition to the material given, however, this was scripted in two studies only (Little *et al.*, 2005; Macfarlane *et al.*, 2002). Thus, it is unclear whether this factor had any effect towards the outcome possibly in addition, or independently, to the face-to-face intervention delivery.

Consultations for MAS were addressed only by studies delivering their intervention by post. In particular, seven studies sent their materials by post with mixed results: Heaney et al. (2001) and Thomson et al. (1999) found no significant differences after a 12- and 6-month follow-up respectively, whereas both Little et al. (2001) and Vickery et al. (1983) found significantly less consultations in their intervention groups for a 12-month follow-up period. Similarly, Terry and Pheley (1993) found significantly fewer consultations for the intervention group but only for the first 2 months after delivery out of the 12-month follow up period. In Usherwood (1991), significantly fewer consultations were found in the intervention group for sore throat but not for the other symptoms included in the booklet such as cough, fever and painful ear. Similar pattern was observed by Morrell et al. (1980) where there were significantly less consultations for certain symptoms (sore throat, diarrhoea and fever) but not for others (cough, minor trauma, stuffy nose).

Assessment of re-consultations for symptoms included in the intervention materials were addressed by four studies all of which delivered their intervention during the consultation at the GP. Taylor et al. (2005) found no significant differences between the intervention and the non-intervention groups. Macfarlane et al. (2002) found a reduction in the intervention group but not reaching statistical significance whereas in Macfarlane et al. (1997) the reduction in the intervention group was significant. On the other hand, Little et al. (2005) found significant increased attendance in the intervention group using the same intervention material as Macfarlane et al. (1997).

Finally, consultations in general were assessed by studies in both types of interventions. Booklets given during consultation visits showed no significant differences with the control groups for studies using this method (Little *et al.*, 2005; Platts *et al.*, 2005; Taylor *et al.*, 2005; Francis *et al.*, 2009). On the other hand, studies sending their intervention materials via post had mixed results: Heaney et al. (2001) and Usherwood (1991) found no significant differences whereas Hansen (1995) had significantly fewer consultations for the intervention group but their follow-up period was 6 months compared to one year for the former studies. Only Vickery et al. (1983) had significantly less consultations over a 12-month period but it is unclear whether the material was sent more than once to the participants.

The study by Hansen (1990) was not included in the above narrative analysis as it was not clear where the intervention was delivered and by whom.

The focus of the health information

The trial by Little et al. (2001) was the only study that compared two types of booklets given to the participants: a booklet addressing range of minor ailments and a summary card which contained a smaller number of symptoms mainly related to ARTI. The participants receiving the summary card had fewer consultations compared to the control; those receiving the booklet showed no difference in consultations compared to the control.

Theoretical basis and rationale of the interventions

The majority of the trials did not explicitly indicate whether the development, implementation or evaluation of their behaviour change interventions was informed by any theoretical framework. Most of the interventions were developed based on the assumption that people had limited knowledge and information about the natural history of minor acute conditions and the self-care management skills necessary to deal with the subsequent symptoms. This view of help seeking behaviour has been labelled as 'the information deficit model' (Heaney *et al.*, 2001) where people seek professional help for their symptoms due to inadequate information or misconceptions which could be related to the nature of the symptoms such as the cause, severity and duration as well as the ways they can be controlled. The assumed lack of information is thought to lead to increased negative feelings such as worry, anxiety and health threat when faced with such symptoms. Use of health services is thought to be the typical way for coping with heightened negative feelings and thoughts (e.g. Hansen 1995; Hansen 1990; Morrell *et al.*, 1980). Thus supporting self-care by providing information about the management of such symptoms is assumed to lead to improved outcomes for both the patients and the care services: increasing people's knowledge by making them aware of the necessity of antibiotics and their consequences; helping them to make more appropriate referrals and reducing demand for primary care services; improving symptom management; increasing patient satisfaction. In addition, there is an underlying assumption that the recipient of the information will process and relate to the content of the intervention which in turn will influence behaviour change.

An exception to this approach was the trials by Alder et al. (2005) and Francis et al. (2009). Specifically, Alder et al. (2005) developed the communication intervention arm of their intervention based on the constructs of self-efficacy and outcome expectations of Social Cognitive theory (SCT; Bandura *et al.*, 1997). The authors explained how they implemented the constructs in the intervention: parents were trained to ask and answer questions in role-playing exercises aiming to promote more effective communication between parents and GPs during real consultations. The communication training also aimed to address expectations regarding antibiotic treatment. Results indicated that the communication arm was more effective than more passive forms of information, such as receiving a booklet, efficacy to communicate with the clinicians and antibiotic prescription. However, the study was underpowered (20 individuals per arm) and had a likely risk of bias. The booklet and the clinician training in intervention by Francis et al. (2009) had theoretical roots in SCT and Theory of Planned Behaviour (Ajzen 2002) according to the authors. In particular, they describe how the constructs of self-efficacy and outcome expectations were incorporated in the communication strategies of the training programme for the clinicians and the booklet for the patients. However, there was no information which constructs of the TPB were integrated in the intervention and how.

3.4 Conclusion

There is a growth of information provided to health service users as a result of recognising the right and importance of involving individuals in their healthcare at one end and the growing demand on health services on the other posing a threat on consultation time and quality of care provided to patients (Howie *et al.*, 1999). Consequently, there has been an increasing availability of information materials for self-care and management of symptoms considered of ‘minor’ nature, relatively short in duration and no immediate health threat. This systematic review of 18 trials (22 studies) investigated a range of interventions providing information on ARTI or MA. The findings are grouped under the corresponding objectives, as set at the beginning of the review, and under the studies’ intervention comparisons in order to gain a better insight of the elements of the interventions that are most effective. Narrative synthesis of the findings indicated the following results for the most investigated outcomes:

First objective: To determine the effectiveness of health educational material, as a single or as a part of a multiple intervention, in improving outcomes such as health service use and physical health, psychological outcomes and financial costs.

(a) Patient health information vs. no intervention

There was mixed evidence as to whether health information can be effective for *consultation rates for symptoms targeted in the intervention*. Providing information via post showed a reduction of consultations (Vickery *et al.*, 1983; Terry and Pheley 1993) although the generalisability of the studies to current practice is limited as they were published over 20 years ago. In addition, other studies showed no differences between the groups (Usherwood 1991; Heaney *et al.*, 2001). Interventions delivered during consultation (Little *et al.*, 2001c) may be more effective although the particular study showed fewer visits for one aspect of the intervention (card) but not for the other (booklet). In terms of *consultation visits in general*, again information via post appeared to be effective in some studies (Hansen 1990; Hansen 1995; Vickery *et al.*, 1983) for both children and adults although they were rated with a likely risk of bias. In addition, the evidence was not consistent as other trials did not find any differences between the intervention and the control groups (Usherwood 1991; Heaney *et al.*, 2001; Platts *et al.*, 2005). *Re-consultations* may be reduced if leaflets are given during the consultation and to adults (Macfarlane *et al.*, 1997) rather to parents (Francis *et al.*, 2009).

b) Patient health information vs. health information on other symptoms and/or conditions

Interventions do not appear to be effective for *re-consultations* nor for *antibiotic prescribing* when given during clinic appointments or via post addressing either parents for their children's symptoms or adults in general (Alder *et al.*, 2005; Taylor *et al.*, 2005).

c) Patient health information vs. multiple interventions including health information

No discernible pattern could be deduced from this comparison category as there were no significant differences between groups for outcomes such as antibiotic prescribing (Alder *et al.*, 2005) and appropriateness of health-care use (Rasmussen 1989); both studies had a likely risk of bias.

d) Patient health information as part of a multiple intervention vs. multiple interventions without patient health information

Provision of health information leaflets was no more effective than verbal advice for re-consultations (Macfarlane *et al.*, 2002) and in certain cases there was an increase of the target outcome for the printed information intervention arm (Little *et al.*, 2005; Moore *et al.*, 2009). In terms of antibiotic use, giving leaflets during the consultation appeared to be more successful than no leaflet (Macfarlane *et al.*, 2002) although this finding was not consistent (Little *et al.*, 2005).

Second objective: To explore whether the characteristics of health educational materials (e.g. the format, setting, mode of delivery) can influence outcomes.

Studies evaluated different forms of printed information materials distributed under various conditions, e.g. the format and the length of the information, how the intervention was delivered, the population being targeted, number and types of symptoms and/or conditions addressed. A sub-group narrative analysis was carried out and the trials under *format*, *setting* and *circumstances* were grouped together under a broader category of interactive vs. non-interactive interaction. The analysis showed mixed results: re-consultations for MA and general symptoms were not significantly reduced in the interactive studies; on the other hand, consultations for MA were reduced in the majority of the non-interactive studies but it was less clear for the general symptoms.

It is interesting to note that there was variation of behavioural responses to individual symptoms within the same intervention suggesting that further examination is required for individual symptoms, e.g. Usherwood (1991) found significantly less contacts for sore throat but not for other symptoms included in the intervention; Morrell *et al.* (1980) observed less consultations for certain symptoms, such as fever, but not for others.

It is difficult to form definite conclusions from the descriptive analysis but the findings from the existing trials suggest that non-interactive interventions, which were the majority, are more likely to provide significant reductions for consultations for MA contacts and possibly for general symptoms rather than interactive interventions.

Third objective: To identify which theoretical constructs and/or assumptions were used, if any, to inform the development and/or evaluation of the interventions.

The majority of the studies have not explicitly drawn from a particular theoretical health behaviour change model to design, implement or evaluate their intervention methods. The two exceptions (Alder *et al.*, 2005; Francis *et al.*, 2009) incorporated constructs from the SCT and TPB theories to the intervention arms although there were methodological issues (Alder *et al.*, 2005) that do not enable to form definite patterns. A common assumption in the trials that seems to underlie their rationale is that individuals may not have adequate and accurate knowledge about the natural history of common minor acute conditions and are unaware of all the ways they can self-manage the subsequent symptoms. The assumed gap in information and knowledge may lead to increased anxiety and a health threat perception that can subsequently lead to increased use of health services in order to cope with such perceptions and negative feelings. The gap in knowledge, the subsequent negative emotional reaction coupled with the growing demand for information from the individuals about their healthcare and the recognition that they can be actively involved in the decision making about their health (Coulter 1998) has lead to the design of interventions that aim to address the above factors. Thus, the provision of health information (mainly printed), sometimes supplementing and reinforcing the information provided by clinicians, aims to address a gap in knowledge about minor acute conditions, improve management skills for symptoms, and provide the guidance when would be most appropriate to see the doctor that would ultimately influence patient's behaviour change. However, the results from the interventions provide no firm indication whether such assumptions are adequate to explain people's behaviour when they are unwell; individuals receive information yet they often seek professional help.

3.4.1 Methodological considerations

The trials were conducted over a period of 30 years of development in health education during which time RCTs have become progressively more common. In part, studies reflected such change in the reporting of their methodology and findings. In addition, the variable methodological quality contributed to the complexity and the heterogeneity of the evidence.

In particular, the methods used to generate a random sequence and conceal allocation were not always explicitly stated; from the available information, five trials were considered to use adequate allocation concealment measures (Everitt *et al.*, 2006; Francis *et al.*, 2009; Little *et al.*, 2005; Macfarlane *et al.*, 1997; Macfarlane *et al.*, 2002) such as the use of

sealed envelopes. However, most studies did not report sufficient details on allocation schedules to make meaningful conclusions about bias. In addition, for two studies concealment of the intervention category was assessed as inadequate (Platts *et al.*, 2005; Taylor *et al.*, 2003). Despite GPs not being told at the beginning of the intervention arm allocation, they were later informed either by the researchers or by the participants of the allocated category in order to provide further encouragement in the use of the health information being given. There was no evidence whether the information was standardised thus the effect of this confounding variable might have varied. In addition, for most trials (n=10) it was not clear whether the outcome assessors were blind to the allocation category. Just over half of the trials reported a power calculation for their sample size whereas the majority (n=10) analysed their results based on an intention to treat analysis. Moreover, the majority of the trials reporting on drop outs, showed no evidence of imbalances in loss to follow up between the intervention and control arms of the trials.

In addition, for a lot of outcomes, particularly under the psychosocial category, the questionnaires were mostly developed by the authors for the needs of the trial thus making it difficult to draw comparisons between studies. The content of the intervention was not assessed in the current review as most of them were not available. However, the span of 30 years over which the trials were conducted will have undoubtedly introduced changes to the educational content and the self-care suggestions. Not all studies included details on the development of their intervention materials and the degree of involvement by possible participants. In those reporting such information, some of the materials were designed by the authors drawing from their personal experience usually in consultation with other health care professionals; a minority have obtained patients' views and opinions to test the content and usability prior to delivering them (e.g. Francis *et al.*, 2009; Everitt *et al.*, 2006)

Although most studies tried to reduce potential risk for contamination in their intervention arms by asking participants not to use other sources of health information or share it with non-participants, there were cases where it was feasible the intervention material be made available to the control group (e.g. Thomson *et al.*, 1999). However, the reported small number of such cases (5%) might have not influenced the end outcome.

3.4.2 Implications

As seen in chapter 1 and discussed earlier in this chapter, a wide range of government policies have been advocating for more responsibility being given to the individuals for their health and encouraging methods where self-care could be supported and promoted. This review has looked at a range of interventions serving the above purpose and the results are limited by the range of materials used in the interventions in the trials and the wide range of outcomes measured. The current evidence, despite the variability of methods and content of the interventions, seem to address some of the issues highlighted by the studies presented in chapter 2 about the factors that make people seek professional help when they or a member of their family experience minor ailments. Although the majority of the intervention materials were unavailable, according to the authors the materials on the whole included information on how to assess the severity of the symptoms under investigation, suggest self-management methods individuals could use and when to seek further advice.

However, as the findings from chapter 2 pointed, there are further issues people experience and are concerned with, other than lack of knowledge about symptoms and available treatments that could influence health-seeking behaviour. Evidence from psychosocial models suggests a complex array of mechanisms in explaining the processes involved in influencing health behaviour. For example, individuals seem to have their own personal views of when someone is healthy, unwell, or needing further professional care. They may have already used various self-management methods prior to assessing whether their condition necessitates medical attention. Materials may reinforce some of the ideas in these personal models and/or address possible misconceptions such as the expected duration and severity of the symptoms, their self-limiting nature and the use and effectiveness of over-the-counter medication and antibiotics. However, provision of information only is not adequate enough to address the influence and the context of the range of factors affecting behaviour change.

The next chapter presents the development of the intervention and discusses the various components regarding its structure and content.

Table 1 Quality assessment of included studies

Author	Design	Randomization/ Comparability of groups	Blinding	Intervention description	Exposure to intervention	Generalisability	Risk of bias
Alder et al 2005	RCT	Unclear-not reported	Unclear-not reported	Low-intervention described	Low-exposure occurred at the clinic	Low-US primary care setting	Likely
Anderson/Morrell et al 1980	RCT	Unclear-not reported	Unclear-not reported	Low-intervention described	Low-% of parents using booklet is reported	High-UK, over 30 year old study	Likely
Everitt et al 2006	RCT	Low-method reported	High – open trial	Low-intervention described	Low- exposure occurred during consultation	Low-UK primary care practices	Minimum
Francis et al 2009	CRCT	Low-method reported	High-clinicians aware of group category	Low-intervention described	Low-exposure occurred during consultation	Low-UK primary care setting	Minimum
Hansen 1990	RCT	Unclear-not reported	Unclear-not reported	Low-intervention described	Unclear-no details about the setting	High-Denmark, over 20 year old study	Likely
Hansen 1995	RCT	Unclear-not reported	Unclear-not reported	Low-intervention described	Unclear-no details how many parents received the intervention	High-Denmark, over 20 year old study	Likely
Heaney et al 2001	RCT	Low-method reported	Low-outcome assessors not informed of group category	Low-intervention described	Low-% of participants using the intervention materials	Low-Scotland home setting	Minimum
Little et al 2001	RCT	Low-method reported	High – open trial	Low-intervention described	Low-exposure occurred during consultation	Low-UK primary care practice	Minimum
Little et al 2005/Moore et al 2009	RCT	Low-method reported	Low-blinding of outcome assessor	Low-intervention described	Low-exposure occurred during consultation	Low-UK primary care practice	Minumum

Table 1 (*continued*)

Author	Design	Randomization/ Comparability of groups	Blinding	Intervention description	Exposure to intervention	Generalisability	Risk of bias
Macfarlane et al 1997	RCT	Low-method reported	Low-GPs not informed of the group category	Low-intervention described	Low-exposure occurred during consultation	High-UK, over 15 year old study	Minimum
Macfarlane et al 2002	RCT	Low-method reported	Low-GPs not informed of the group category	Low-intervention described	Low-exposure occurred during consultation	Low-UK primary care	Minimum
Platts et al 2005	RCT	Low-method reported	High-clinicians aware of group category	Low-intervention described	Low-exposure occurred at the consultation	Low-UK primary care practice	Minimum
Rasmussen 1989	RCT	Unclear-method not reported	High-nurses aware of group allocation	Low-intervention described	Low-exposure occurred during visit at the clinic	High-Sweden, over 20 year old study	Likely
Taylor et al 2003/Taylor et al 2005	RCT	Low-method reported	Low-clinicians not informed of group category	Low-intervention described	Low-exposure at the clinics and via post	Low-US research-based practice centres	Minimum
Terry & Pheley 1993	RCT	Unclear-not reported	Unclear-not reported	Low-intervention described	Unclear-not reported	High-US, over 20 year old study	Likely
Thomson et al 1999 ; 2002	RCT	Low-method reported	Low-staff blind to the allocation category	Low-intervention described	Unclear-not reported	Low-GP primary care practice	Minimum
Usherwood 1991	RCT	Unclear-method not reported	Unclear- not reported	Low-intervention described	Low-% of parents reported	High-UK, over 20 year old study	Likely
Vickery et al 1983	RCT	Unclear-method not reported	Unclear- not reported	Low-intervention described	Unclear-not reported	High-US, over 30 year old study	Likely

CRCT : Cluster randomized controlled trial ; RCT : Randomized controlled trial;

Table 2 Studies by intervention comparison and outcome: sample size and symptoms addressed

Intervention comparisons*	Health Information on MA vs. No Intervention (N=10)	Health Information on MA vs. Information on other conditions (N=1)	Health Information on MA vs. Multiple interventions including Health Information on MA (N=1)	Health Information on MA with other interventions vs. Other interventions (N=4)
Outcomes**				
Initial consultations for MA†	Vickery et al (1983); N=1339; range of MA Usherwood (1991); N=419; five MA Terry & Pheley (1993); N=14917; RTIs † Heaney et al (2001); N=4953; range of MA Little et al (2001); N=2965; range of MA	No studies	Vickery et al (1983); N=1339; range of MA	Thomson et al (1999); N=935; range of MA
Re-consultations for MA	Macfarlane et al. (1997); 1006 patients; lower RTIs Francis et al (2009) N= 558; RTIs	Taylor et al (2005); N=356; upper RTIs	No studies	Macfarlane et al (2002); N=205; acute bronchitis Little et al (2005); N=807; lower RTIs Moore et al (2009); N=807; lower RTIs

Table 2 (*continued*)

Intervention comparisons*	Health Information on MA vs. No Intervention (N=10)	Health Information on MA vs. Information on other conditions (N=1)	Health Information on MA vs. Multiple interventions including Health Information on MA (N=1)	Health Information on MA with other interventions vs. Other interventions (N=4)
Outcomes**				
Initial consultations in general	Vickery et al (1983); N=1339; range of MA Hansen (1990); N=98; range of MA Usherwood (1991); N=419; five MA Hansen (1995); N=1891; range of MA Heaney et al (2001); N=4953; range of MA Platts et al (2005); N=1967; range of MA	No studies	Vickery et al (1983); N=1339; range of MA	No studies
Antibiotic prescription	Francis et al (2009) N= 558; RTIs	Taylor et al (2005); N=356; upper RTIs Alder et al (2005); N=80; RTIs	No studies	Thomson et al (1999); N=935; range of MA
Antibiotic use	Francis et al (2009) N= 558; RTIs	No studies	No studies	Macfarlane et al (2002); N=205; acute bronchitis Little et al (2005); N=807; lower RTIs

Table 2 (*continued*)

Intervention comparisons* Outcomes**	Health Information on MA vs. No Intervention (N=10)	Health Information on MA vs. Information on other conditions (N=1)	Health Information on MA vs. Multiple interventions including Health Information on MA (N=2)	Health Information on MA with other interventions vs. Other interventions (N=4)
Appropriateness of health care use	Hansen (1990); N=98; range of MA	No studies	Rasmussen 1989; N=331; range of MA	No studies
Symptom severity	Everitt et al (2006); N=307; Acute eye conjunctivitis	No studies	No studies	Little et al (2005); N=807; lower RTIs
Symptom duration	Everitt et al (2006); N=307; Acute eye conjunctivitis	No studies	No studies	Little et al (2005); N=807; lower RTIs
Confidence in self-care management	Little et al (2001); N=2965; range of MA	No studies	No studies	No studies
Use of self-care skills	Hansen (1990); N=98; range of MA	No studies	No studies	Thomson et al (2002); N=323; range of MA
	Platts et al (2005); N=1967; range of MA			
Satisfaction with the information provided	Everitt et al (2006); N=307; Acute eye conjunctivitis	No studies	No studies	Little et al (2005); N=807; lower RTIs
	Francis et al (2009); N= 558; RTIs			

Table 2 (*continued*)

Intervention comparisons*	Health Information on Intervention (N=10)	Health Information on MA vs. Intervention	Health Information on MA vs. Multiple Information on other conditions (N=1)	Health Information on MA with other interventions including Health Information on MA (N=1)	Health Information on MA with other interventions vs. Other interventions (N=4)
Anxiety	Hansen (1990); N=98; range of MA	No studies	No studies	No studies	
Primary Care Costs	Terry & Pheley (1993); N=14917; RTIs	No studies	Vickery et al (1983); N=1339; range of MA	No studies	

* The Intervention Comparison 'Patient health information vs. verbal advice' was not included as there were no studies for this category.

** The following outcomes were not addressed in any of the studies thus not included in the table above: knowledge for self-care of minor ailments; quality of life; antibiotic use costs; hospital care use costs.

† MA= Minor Ailments; RTIs = Respiratory Tract Infections.

- The two studies from the same trial, Morrell (1980) and Anderson et al (1980) were not included in the above table as there was no evidence what the control group received.

Table 3 Studies by intervention comparison and outcome: summary results

Intervention comparisons*	Health Information on MA vs. No Intervention (N=10)	Health Information on MA vs. Information on other conditions (N=1)	Health Information on MA vs. Multiple interventions including Health Information on MA (N=1)	Health Information on MA with other interventions vs. Other interventions (N=4)
Outcomes**				
Initial consultations for MA†	Vickery et al (1983); significant effect favouring intervention Usherwood (1991); significant effect favouring intervention Terry & Pheley (1993); significant effect favouring intervention (colds only) Heaney et al (2001); no effect Little et al (2001); significant effect favouring intervention	No studies	Vickery et al (1983); no effect	Thomson et al (1999); no effect
Re-consultations for MA	Macfarlane et al. (1997); significant effect favouring intervention Francis et al (2009); no effect	Taylor et al (2005); no effect	No studies	Macfarlane et al (2002); no effect Little et al (2005); significant effect not favouring intervention Moore et al (2009); no effect

Table 3 (*continued*)

Intervention comparisons*	Health Information on MA vs. No Intervention (N=10)	Health Information on MA vs. Information on other conditions (N=1)	Health Information on MA vs. Multiple interventions including Health Information on MA (N=1)	Health Information on MA with other interventions vs. Other interventions (N=4)
Outcomes**				
Initial consultations in general	Vickery et al (1983); significant effect favouring intervention Hansen (1990); significant effect favouring intervention Usherwood (1991); no effect Hansen (1995); significant effect favouring intervention Heaney et al (2001); no effect Platts et al (2005); no effect	No studies	Vickery et al (1983); no effect	No studies
Antibiotic prescription	Francis et al (2009); significant effect favouring intervention	Taylor et al (2005); no effect	No studies	Thomson et al (1999); significant effect not favouring intervention
Antibiotic use	Francis et al (2009) significant effect favouring intervention	No studies	No studies	Macfarlane et al (2002); significant effect not favouring intervention Little et al (2005); no effect

Table 3 (*continued*)

Intervention comparisons* Outcomes**	Health Information on MA vs. No Intervention (N=10)	Health Information on MA vs. Information on other conditions (N=1)	Health Information on MA vs. Multiple interventions including Health Information on MA (N=1)	Health Information on MA with other interventions vs. Other interventions (N=4)
Appropriateness of health care use	Hansen (1990); no effect	No studies	Rasmussen 1989; no effect	No studies
Symptom severity	Everitt et al (2006); no effect	No studies	No studies	Little et al (2005); no effect
Symptom duration	Everitt et al (2006); no effect	No studies	No studies	Little et al (2005); no effect
Confidence in self-care management	Little et al (2001); Significant effect favouring the intervention	No studies	No studies	No studies
Use of self-care skills	Hansen (1990); Significant effect favouring the intervention	No studies	No studies	Thomson et al (2002); no statistics
Satisfaction with the information provided	Platts et al (2005); no statistics Everitt et al (2006); Significant effect favouring the intervention Francis et al (2009); no effect	No studies	No studies	Little et al (2005); no effect

Table 3 (*continued*)

Intervention comparisons*	Health Information on MA vs. No Intervention (N=10)	Health Information on MA vs. Information on other conditions (N=1)	Health Information on MA vs. Multiple interventions including Health Information on MA (N=1)	Health Information on MA with other interventions vs. Other interventions (N=4)
Outcomes**				
Anxiety	Hansen (1990); no statistics	No studies	No studies	No studies
Primary Care Costs	Terry & Pheley (1993); no statistics	No studies	Vickery et al (1983); no statistics	No studies

* The Intervention Comparison 'Patient health information vs. verbal advice' was not included as there were no studies for this category.

** The following outcomes were not addressed in any of the studies thus not included in the table above: knowledge for self-care of minor ailments; quality of life; antibiotic use costs; hospital care use costs.

† MA= Minor Ailments; RTIs = Respiratory Tract Infections.

- The two studies from the same trial, Morrell (1980) and Anderson et al (1980) were not included in the above table as there was no evidence what the control group received.

Chapter 4 The development of the cold and flu symptoms website intervention

4.1 Aims of this chapter

The chapter aims to describe in detail how the cold and flu symptoms website intervention was developed and to discuss its various components and the underlying rationale in bringing them together. It draws from the evidence presented in the earlier chapters and in particular from the areas of tailoring and the internet health communication in chapter 1, and the literature review in chapter 2 about the reasons why people consult for respiratory tract infections and minor ailments in general. In addition, it draws from the theoretical frameworks of the Common Sense Model and the Social Cognitive Theory, presented in chapter 2, in explaining self-care and consultation behaviour. The chapter is divided into two sections: the first section presents the structure of the website, its components and what topics each component addresses. The second section focuses on the content of the intervention and presents the various areas it draws from and the rationale behind each feature: the content and phrasing of the health messages, the theoretical constructs, and the tailoring of the information. These are discussed by providing examples from the actual materials.

4.2 The structure of the intervention

The intervention materials were designed to make them available online but due to lack of resources to fund the programming and the development of the website, it was decided to continue with the study and present them to the participant in a paper format.

The intervention addressed five symptoms associated with respiratory tract infections: cough, runny or stuffy nose, ear ache, sore throat, and pain or pressure in the face. Thus the information provided focused on the specific symptoms. The selection of symptoms was based on a discussion with other health care professionals that advised on the development of the intervention. Due to the considerable amount of information collated for each symptom, the time taken to organise and subsequently to present it manually to the participants, it was decided to focus only on the five symptoms above rather to add further ones. Additional symptoms such as feeling weak and generally being unwell were not included in the list of main symptoms for practical reasons as well: such general symptoms potentially require a considerable number of subsequent screening questions in order to

gain more information about the nature of the symptoms and the underlying cause(s) so to provide specific advice. In this case, the screening section (section 3) would have been quite long and complicated to handle via hand. In some instances symptoms of feeling weak and unwell are accompanied by more specific symptoms including the five main symptoms already mentioned above. So it was decided to focus on specific symptoms and any general ones be addressed at subsequent stages of the online intervention materials.

The materials for each symptom were split into various sections each presenting or addressing a different health message or question. The sections were presented sequentially by the researcher so that all participants proceeded through the intervention in the same way. All the symptoms had the same sections but varied in length, from a paragraph to two pages, depending on the information presented. The materials of each symptom had 17 sections. The sequence of the sections and a summary of their content are presented below. Some sections, such as section 13 ‘Other related problems’, addressed more than one health problem where participants were able to choose which ones to see. The word ‘symptom’ in the section titles was replaced by the name of the specific symptom selected by the participant. The materials prepared for all the symptoms are presented in Appendices 8-12.

Sequence of sections in the intervention with their content summary

Section 1: Your personal cold and flu doctor

Summary of contents: A generic page introducing the intervention addressing questions such as: ‘Do you feel under the weather and unwell?’, ‘Are you not sure if you need to see the doctor?’, ‘What are you going to see in the following pages’, and ‘Who is providing the advice’.

Section 2: Which symptom is bothering you most?

Summary of contents: The list of the five symptoms: cough, runny or stuffy nose, ear ache, sore throat, and pain or pressure in the face, where participants had to select the one that was bothering them most to get advice and information.

Section 3: Screening questions

Summary of contents: Multiple choice diagnostic questions tailored to the symptom selected in the previous section e.g. How long have you had your sore throat for? with answer options: Less than 2 weeks, Between 1-2 weeks, More than 2 weeks. This section also included questions to address variations of the same symptom where appropriate. This was applied for the cough symptom where participants were asked to describe their cough from a list of cough-related symptoms i.e. getting a tickle or an itchy feeling in the throat, deep hacking cough, having a pain in the chest when coughing, coughing up phlegm, wheezing and rattling when coughing.

Section 4: Your personal diagnosis report

Summary of contents: Tailored health message based on the answers provided in the earlier sections, with two possible outcomes: a) Need to see the doctor and stating the reasons why; b) No need to see the doctor with explanation of what the indicated symptoms suggest. In case participants indicated a chronic illness in the screening questions (for cough and earache only), in addition to their symptoms, a warning message appeared with the second diagnosis outcome for individuals to be more attentive to the progress of their symptoms. If participants received outcome a) the warning did not appear, the intervention stopped at that point and they were not able to proceed any further.

Section 5: Do I need to see the doctor for these symptoms?

Summary of contents: Whether the symptoms are a sign of a serious illness that needs professional help, and availability of treatments without prescription. There was an option to see further details on which symptoms suggest to seek help from the doctor.

Section 6: You should go to see your doctor about your symptom if:

Summary of contents: List of symptoms and signs suggesting need to seek professional help, e.g. 'Your sore throat has lasted for 2 weeks without any improvement'.

Section 7: When should my symptoms clear up?

Summary of contents: Advice about estimated time of symptoms clearing and warning of possible relapse e.g. You may notice that there are times when your symptoms may start to clear, or clear completely, and then come back again after a short while.

Section 8: Will seeing the doctor help my symptoms clear up more quickly?

Summary of contents: Information about the things the doctor can do, e.g. advice how to get relief from your symptoms, and the availability of such information in the subsequent pages of the intervention.

Section 9: Would it help to try antibiotics for my symptoms?

Summary of contents: Advice on whether antibiotics are recommended for the indicated symptoms and if any evidence available about their effectiveness in reducing the symptom duration.

Section 10: More information about the risks and uses of antibiotics

Summary of contents: This was an optional section to read if the previous section was selected. It provided evidence why taking antibiotics when not needed could be dangerous and in what cases antibiotics are given.

Section 11: Do you think your symptoms might be a sign of something more serious?

Summary of contents: A list of conditions commonly associated with the chosen symptom for the participant to check further if concerned; for example in case of cough, the list of conditions included pneumonia, bronchitis and emphysema.

Section 12: Advice on relieving your symptoms

Summary of contents: Option to select seeing advice on 'things you can do yourself', and/or advice on 'things you can get from the chemist'. The word 'chemist' refers to pharmacy or pharmacist, as in other intervention materials for cold and flu symptoms. Both 'chemist' and 'pharmacist' are used interchangeably in the subsequent text.

Section 13: Other related problems

Summary of contents: A list of problems the users may experience in addition to the selected symptoms and wanted to see further, e.g. feeling weak and tired, being unable to sleep properly.

Section 14: Advice on helping the immune system – What else you can do

Summary of contents: A bullet-point list of advice on helping the immune system to fight the infection, e.g. reducing stress, drinking plenty of fluids, taking supplements such as zinc with vitamin C and the evidence on its usefulness.

Section 15: Frequently Asked Questions

Summary of contents: A list of question-answer pairs to select from, addressing issues in more detail or not covered in the earlier sections, e.g. I tried everything and I'm still unwell, I don't think there is anything else I can do.

Section 16: Do you have any other symptoms?

Summary of contents: The same question as in the second section 'Which symptom is bothering you most?', providing the opportunity to the participant to find out about another symptom and going through the same sections as above.

Section 17: Who is providing the advice?

Summary of contents: A list of the references of the sources providing the evidence-based information and advice of the earlier sections.

As specified above, some sections combined both generic and tailored health messages. Tailored messages appeared in the form of participants choosing they wanted to see, e.g. section 12 on advice on what to do, as well as messages based on answers given in the previous questions, e.g. section 4 regarding the diagnosis report.

Readability scores were obtained for all the materials calculated by the Flesch-Reading Ease score (Flesch 1948). This is a widely accepted and one of the most accurate readability measures (Payne *et al.*, 2000). Scores range between 0-100 where higher scores suggest materials are easier to read. The mean readability score for all the materials was 60, and scores ranging between 60 to 70 are easily understood by 13-15 year olds and considered appropriate for most standard documents (Gilmour 2007).

4.3 The content of the intervention

This section focuses on the content of the intervention and is divided into three parts. The first part discusses the sources informing the medical content of the health messages as well as the phrasing and the wording used in the messages. The second part looks at the theoretical constructs used in the intervention, the underlying rationale for their use, and how these were implemented. Finally the third part examines the area of information tailoring, and the level of its application in the intervention.

4.3.1 The sources and text coherence of the health messages

The medical content of the health messages, e.g. the type of screening questions, the advice about the risks of antibiotics and on what to do, was drawn from a range of sources and its development went through a multi-stage process. Through the systematic review (chapter 3) a wide-range of patient information booklets, leaflets, and other literature was obtained looking at self-care education for both a wide range of minor ailments and more specific groups such as respiratory tract infections (RTI). In addition, other non-academic sources were identified such as patient information websites, such as the then NHS Direct, charities involved in producing and assessing health information quality, e.g. Developing Patient Partnerships, Patient Involvement, as well as leaflets and information material obtained from local surgeries. Furthermore, systematic searches were carried out for evidence-based information regarding self-care advice for RTI, e.g. through the Cochrane database and Clinical Evidence online database which is part of the British Medical Journal Evidence Centre providing clinical evidence in informing treatment decisions. The materials and the evidence obtained were then checked and synthesized to develop the health messages for the intervention.

The development of the health materials was also informed by the Discern criteria. These are guidelines produced to inform the development of quality health information for both printed and online mediums (Charnock 1998; Charnock and Shepperd 2004). The suggested checklist enables health professionals, information providers and consumers to assess the reliability and credibility of the content and evaluate treatment choice. Some of the criteria, also included in the intervention materials, were: stating clearly the aims of the project, what is meant to address and cover, who might find it useful, references to the sources used as evidence, and discussion of the gaps in knowledge or differences in expert opinion. Marshall and Williams (2006) argued that Discern and other bodies producing similar sets of guidelines such as the *HiQuality* checklist, produced by the Centre for Health Information Quality (Shaddock 2002), present generalised features of quality assessment and do not meet individual information needs, e.g. do not acknowledge that people's previous knowledge and experiences can potentially influence their assessment of the information quality. Therefore in this intervention, in addition to the aforementioned criteria, the content of the materials included components addressing possible past experiences relating to the management of RTI, e.g. the use of antibiotics or seeing the doctor for similar symptoms.

The materials were then presented to a group of three academic general practitioners, experts in the area of respiratory tract infections, for feedback. Each expert viewed all the materials separately and shared views with the others at a meeting. This process lead to some further modification and changes to the health messages.

The usability literature provided insights and suggestions about the design features that could contribute to the effectiveness of health materials in terms of aiding comprehension, attention and recall of the information, and behaviour influence (Kools *et al.*, 2007). Kools *et al.* (2004) argued that principles from cognitive psychology can be applied to increase text comprehension and improve reading standards for all literacy levels. The coherence of the text, i.e. having a logical and consistent structure, is a major factor influencing its understanding as it helps the reader to follow through the text and make the appropriate relations between concepts. There are two levels at which the text can be coherent (McNamara *et al.*, 1996): at macro level, referring to the structure of the text, and at micro or local level, referring to the connection between sentences and paragraphs. A number of writing principles have been proposed by Kools *et al.* (2004) for each level; these are described below followed by examples of their application in the intervention materials.

At macro level, the addition of heading and sub-headings where the topic changes help to guide the reader through the text, highlight relationships between important concepts, and act as cues for subsequent recall of information (Brooks *et al.*, 1983; Wilhite 1988). Each section in the intervention materials had a heading introducing the issues to be covered next and certain sections, such as ‘Advice on relieving your symptoms’ had subheadings to break and better organise the text, i.e. ‘Things you can do yourself’ and ‘Things you can get from the chemist’. A second way to improve text coherence at macro level is the use of ‘macrosignals’. These are a few sentences usually at the beginning of the text that introduce the subsequent topic and set the context how that information relates to the previous section and the overall theme (McNamara *et al.*, 1996). This guides attention during reading and can activate information from previous sections which can lead to enhanced cognitive processing (Glover *et al.*, 1988). For example, section 8 for sore throat stated: “Medical evidence shows that there is usually nothing that the doctor can do to speed up your recovery from a virus. The main things the doctor can do are (...): Help your immune system to fight off the infection”. In the subsequent section this was repeated in the first few sentences: “Medical evidence has shown that antibiotics do not help most

people, as symptoms like these are usually caused by viruses and antibiotics do not work against viruses – our immune system is able to fight off the infection”.

At micro level, the writing principles suggested to increase text coherence included: avoiding the use of ambiguous pronouns to reduce confusion (Kools *et al.*, 2007), e.g. clarifying what *it* or *this* refer to, or having them close to their explanation, e.g. “antibiotic resistance is becoming a big problem (...). This is not just a problem...”. A similar writing principle related to the ambiguous pronouns is the principle of argument overlap. If there are two sentences linked to convey or reinforce an important concept, then that concept needs to be repeated in both sentences. For example in the intervention materials the explanation given about meningitis included: “Meningitis: This is an infection of the membranes that cover the brain and the spinal cord. Meningitis can be caused by bacteria or viruses”. This is an important criterion for textual coherence as it ensures that the reader does not have to make inferences to understand the conceptual relations. Furthermore, the use of sentence connectives can be added to clarify relations between sentences or ideas (e.g. moreover, because), or leading a problem to an action (e.g. therefore you do this).

Another writing principle operating at micro level involves arranging sentences into a ‘given-new’ order where information familiar to the reader precedes the new information. The familiar part comes first complementing the subsequent new piece of information thus reducing the mental effort for comprehension (Clark and Haviland, 1977 cited in Kools *et al.*, 2004 p.274). For example, in explaining pneumonia in section 11 for cough: “This is an infection of the smallest *air passages* in the lungs (alveoli). These *passages* fill up with pus or mucus, preventing oxygen from reaching the blood”. Furthermore, causal relations need to be made explicit (Linderholm *et al.*, 2000) within and between sentences by having a clear description of the causal processes so that the reader can construct the nature and strengths of links among relevant concepts. For example, the diagnosis report for sinusitis included at the beginning: “This infection is also known as sinusitis and it follows on from a cold or other infection which affects the nose”. Finally, constructing sentences in the active voice and reducing the use of passive voice improves text comprehension. This is because in active sentences there is mostly an actor present to whom the subsequent actions or information should be associated with, thus reducing the cognitive load in inferring the relations between concepts. For example, in the section ‘Do I need to see the doctor for these symptoms’, the advice ends with: “You do not need a prescription for such treatments so we have provided detailed advice on the following pages”. In addition,

having the main verb at the start of the sentence shows the reader early on the meaning of the connecting concepts.

Improving the usability of the materials and the communication of the health messages is also related to the use of images and pictures in the text (Kools *et al.*, 2007; Wright 2012) as these design features enable the readers to locate the information more easily and help in the readability of the health messages which in turn can improve the equity in the use of internet health information (Gilmour 2007). Houts *et al.* (2006) in a review on the role of pictures in communicating health messages showed that the use of images can improve attention to, comprehension, and recall of the health information, especially if closely linked to key written text. There was some evidence that pictures can also influence intention and adherence to the target behaviour although this was not consistent in the studies reviewed and it was mostly done with chronic illnesses. The review has also shown that pictures can be particularly helpful to people with low literacy levels, enabling people to understand and make use of the messages conveyed. The intervention materials of all symptoms included a picture in the diagnosis report section depicting which part of the respiratory system was affected, e.g. the tonsils, the sinuses, the throat. The accompanying text referred back to the picture thus there were two message modes complementing each other and reinforcing the diagnosis message. Pictures are viewed as aiding information processing and persuasion (McGuire 1999) by means of drawing attention to key messages, clarifying meanings and facilitating remembering.

Houts *et al.* (2006) argued that people from the intended audience need to be included in designing the pictures as this will help to address any cultural sensitivities, particularly when communicating with people with little exposure to western medicine. However, this was not considered as applicable with the current study as there was no evidence that diagnosis pictures could be interpreted differently across different groups of people. The pictures used in the materials were taken from non-copyright websites and effort was put to ensure they did not convey any other message other than graphically representing the body part referred by the specific section.

In addition to pictures, graphic organisers are another method that can assist text comprehension. They graphically represent and map the relations between concepts in the text (Robinson and Kiewra 1995) thus facilitating a deeper comprehension of the content. They are particularly helpful in long texts and Kools *et al.* (2006) provide two possible

explanations: they help with processing of the information at macro level thus allowing more cognitive capacity to process information on other levels. Secondly, their presence may act as effective recall prompts for information at micro level resulting in better memory and comprehension of the text. The intervention materials of this thesis included several sections, some of which were longer than others, thus it was decided to apply graphical organizers next to each section in order to assist the mapping of the sections in relation to the overall structure of the materials as well as help the reader to navigate easily in the text. The graphical organisers were in the form of a navigation index inserted in the margin next to each section, all starting with the phrase 'You are here' followed by the subsequent levels of the text where the last one referred to the text section that it was next to it. The first and the last level appeared in bold to distinguish them from the other intermediate levels and draw attention to the presenting information. For example the graphic organisers of section 3 of earache were the following:

You are here:

Main Symptom

Earache

Diagnostic questions

The use of the navigation index also allows the participants to view where they are at that point in relation to the content viewed as well as allow them to easily to select and revisit previous sections. Another feature applied to the intervention materials was the use of pop-out effects. In order to comprehend and remember a text, this needs to draw sufficient attention. This is achieved when the features of an item or a text differ from the features of the surrounding context, e.g. by the use of different colour, shape or form (Treisman and Gelade 1980). The pop-out effects were implemented in the intervention materials by the use of different background colour for the diagnosis section from the diagnosis report and the advice sections to highlight to the participant the change to the next stage of the intervention. In addition, the headings and sub-headings of each section appeared in bold. Important points in the text were inserted in boxes within the particular section, e.g. the statement about the effectiveness of antibiotics in section 9 'Would it help to try antibiotics for my symptoms'. Similar boxes appeared in the diagnosis report as well, and these had the heading 'Did you know?' in order to make the particular statement stand out further in

the context of a fairly long section. In cases where there were options for the participant to choose from in order to obtain further information, e.g. section 11 ‘Do you think your symptoms might be a sign of something more serious?’, these options were introduced to the reader with a star-cloud shape with the ‘More Info’ phrase. Lists of signs and symptoms were presented in bulleted form, e.g. section 6 ‘You should go to see your doctor for your symptoms if’ to reduce the monotony of long sentences and draw attention to the key points.

All the techniques mentioned so far aiming to convey clear and unambiguous information, e.g. use of active voice, pictures to aid comprehension, avoiding use of confusing language, and use of headings and subheading to organise the text, can positively influence accessibility to the information and subsequently the level of health literacy of the users as already seen in chapter 1.

4.3.2 Theoretical constructs

Social and psychological theories of health behaviour and behaviour change can contribute significantly in the development of health interventions aiming to influence and change attitudes and behaviour. Such models can provide explanations of the mechanisms involved in behaviour change thus can inform the basis for the development of interventions. The importance of adopting a theoretical framework in developing interventions and incorporating theoretical constructs related to the target behaviour has been already been highlighted in the introduction (chapter 1) and the systematic review (chapter 3).

As already illustrated previously in the literature review (chapter 2), two theoretical models of Social Cognitive Theory (SCT) and Common Sense Model (CSM) were identified as involved in providing explanations for consultation behaviour and motivation to self-care. Thus health messages were developed linking the theoretical constructs of the two theories with the arising issues involved in people’s needs and fears regarding their symptoms and the need to seek professional help.

The following section examines how each of the theoretical model and its constructs were applied in the intervention together with examples from the materials.

Social Cognitive Theory

As already seen earlier in chapter 2, the SCT comprises four main constructs: self-efficacy referring to the belief in one's capabilities to do something; outcome expectations or the beliefs about the consequences of one's actions; goal setting which facilitates future action and guides health behaviour; and socio-structural factors referring to outside factors such as political and economic systems that can facilitate or impede the process of change. All four constructs feed into influencing behaviour change (Bandura 2000). One of the advantages of the SCT is the specification of the techniques through which health behaviour can be changed, something that most health behaviour models do not address (Bandura 2000). The model suggests a range of techniques or strategies on how to implement the constructs of the model. These techniques help to operationalize the theoretical constructs of the model thus providing a consistent framework of tools in applying and later evaluating the model. Bandura (1977; 2000) suggested four main techniques that can influence the main constructs of the model of self-efficacy and outcome expectations:

- a) Direct or mastery of experiences: The use of mastery experience indicates that practising of the behaviour is the most effective way for self-efficacy enhancement as it provides the opportunity to build up experience, develop abilities in overcoming obstacles as well as enabling further goal attainment. An example of this technique is presented in the Table 4 below, where section 15 of the flu-type symptoms intervention aims to enhance self-efficacy about self-care. The advice encourages participants to try some of the advice and provides the opportunity monitoring the progress of symptoms with the help of the intervention.
- b) Interpretation of physical and emotional states: This aims to help people change negative emotional thinking, to reduce stress reactions, and help them reinterpret their physical states and symptoms by giving many possible causes and several different management techniques to increase belief they can control their symptoms. An example of applying this technique in the web-intervention is presented in Table 4, and in particular explaining the causal factors of symptoms and an opportunity to see further on what to do about them.
- c) Verbal persuasion that people possess the capabilities to master given activities is another way to strengthen beliefs about one's capabilities and about the consequences of

their actions. This is further enhanced by structuring situations in ways that bring success and avoid placing the individuals in situations where they are likely to fail often. As seen in Table 4, the example from section 12 of the web-intervention provides evidence of the consequences of steam inhalation as well as step-by-step advice how to implement such action in order to enable individuals to follow the process successfully.

d) Indirect or vicarious experience (modelling): the observation of people similar to oneself performing the target behaviour successfully influences beliefs that they also possess the capabilities to succeed in comparable activities, and teaches observers effective skills and strategies to manage external demands. There are various ways to apply this technique, for example to present a number of vignettes or case histories of individuals similar to the participants, e.g. matched on socio-demographic variables, who also experience similar problems and questions, and then trying to solve these problems. A variation of this method is presenting the role models through the use of videos. In the case of the cold and flu-type symptoms intervention, modelling was applied by citing other peoples' actions and subsequent outcomes when experiencing cold and flu-related symptoms through clinical trials testing remedies for such symptoms. This enables the participants to associate themselves to the often large number of people taking part in the trials as they share similar experiences. An example of applying this technique is presented in Table 4 with extracts from section 12, on the use of zinc and vitamin C to fight viruses.

The intervention did not address the remaining two constructs of the SCT model, i.e. goals and socio-cultural factors, as the issues arising from the literature on minor ailments and acute RTI mostly mapped onto the other two aforementioned constructs of the model, self-efficacy and outcome expectations. In addition, the operationalisation of goals suggests setting specific plans, which can be short- or long-term, in order to carry out the target behaviour (Schwarzer 1992b; Luszczynska and Schwarzer 2005). Thus, in promoting self-care and not seeing the doctor, one needs to develop a detailed action plan how to carry-out the desired actions. Establishing this action plan or volition process facilitates subsequent action and achieving the target behaviour (Bandura 1997a; Gollwitzer and Bayer 1999). For example if someone intends to use natural remedies to alleviate cough symptoms before deciding whether to seek professional help, then a number of steps need to be planned in advance, e.g. what remedies to buy, how to ensure they are natural, where to get them from, when and how to use them. However, the range of self-care behaviours one can do to control the symptoms addressed in the web- intervention was too varied to

develop individual health messages and action plans for each one individually. In addition, the programming of such task is demanding which was not possible to be accommodated with the available resources of the intervention, thus the goal setting construct of the model was not addressed in the intervention. The other construct of perceived socio-structural factors, which influences goal setting, focuses on the barriers or opportunities within the living conditions of the individual. In the case of the cold and flu-type symptoms intervention such factors could include availability of and access to health services, financial problems, or social issues that could be related to consultation behaviour and self-care. However there was no strong evidence from the literature about these issues and their implications to the target outcomes. Furthermore, self-efficacy seems to influence the perception of socio-structural factors, i.e. influencing how people perceive the obstacles and the opportunities in their life circumstances and environment (Luszczynska and Schwarzer 2005). For example people with strong self-efficacy believe they are able to exercise control and overcome obstacles, even if the environment poses constraints rather than providing opportunities (Bandura 1997). Therefore, the web-intervention focused only on the core constructs of the SCT model: self-efficacy and outcome expectations.

Table 4 Application of the Social Cognitive Theory constructs and their techniques in the intervention

Theoretical Construct	Behavioural Techniques	Application of the construct in the web-intervention: example-extracts from the sections of the symptom of sore throat
Self-Efficacy	Direct mastery experience	<p>Section 15: Frequently Asked Questions: I tried everything and I'm still unwell, I don't think there is anything else I can do</p> <p>The various things you are already doing may relieve your symptoms but will not shorten their duration. Sore throat symptoms can take quite a while, sometimes up to 2-3 weeks, to clear away completely. (...) the doctor can do nothing really unless there is a change of symptoms i.e. they are getting much worse. Prescribed medication such as antibiotics can do very little to speed up recovery. (...) Try some of the advice suggestions if you have not already done so, and come back to this website in 2-3 days to check the progress of your symptoms.</p>

Table 4 (*continued*)

Theoretical Construct	Behavioural Techniques	Application of the construct in the web-intervention: example-extracts from the sections of the symptom of sore throat
	Interpretation of physical symptoms and explanation of causes	<p>Section 5: Do I need to see the doctor for these symptoms?</p> <p>Symptoms of a sore throat, or pharyngitis (the medical term for an infected throat) are caused by viruses and can be quite painful and uncomfortable. However, the symptoms you have at present are not a sign of a serious illness that needs to be seen by the doctor. There are available treatments that provide relief from these symptoms. You do not need a prescription for such treatments so we have provided detailed advice on the following pages.</p>
	Modelling	<p>Section 12: Advice on relieving your sore throat</p> <p>Zinc with vitamin C is commonly used to fight viruses. However, a review of 30 studies, involving a total of 11350 people, showed that taking vitamin C daily can only reduce the duration and severity of colds very slightly (up to 8%).</p>
Outcome Expectations	Verbal Persuasion	<p>Section 12: Advice on relieving your sore throat</p> <p>People with similar symptoms report that steam inhalation can ease their symptoms as this opens the airways and stops viruses multiplying. There is some evidence from clinical trials showing this might be helpful for some, although more and larger studies are needed to be sure. You can inhale steam for 5 minutes 3 times a day: Fill half of a two pint sturdy bowl with boiling water and put a towel over your head and breathe in the hot steam or inhale through a gap in your hands.</p>

The Common Sense model

The health messages were developed to address the constructs that comprise the two processing routes of the CSM model i.e. the cognitive and the emotional dimension of the problem. For a detailed explanation of the model the reader is referred to chapter 2; briefly

each route, both at the cognitive and emotional level, helps the individual to understand and act in response of an illness, based on previous experiences, beliefs, and environmental influences. The cognitive route of the model postulates that individuals base their decisions on how to deal with their symptoms on their understanding and beliefs around five central questions or constructs : *a) Identity*: the nature of the symptoms related to the specific condition; *b) Cause*: how one may get the particular illness; *c) Timeline*: the expected duration of the illness threat: acute, chronic or cyclical; *d) Consequences*: the likely effects of the illness on the physical, social and economic domains of one's life; *e) Control or Cure*: the potential of cure and/or control of the illness. The emotional route of the model focuses on the emotional impact of the illness and how the individuals deal with that aspect but overall the emotional route received less attention about its constructs than the cognitive route.

Table 5 below provides examples how the constructs of each of the two processing systems of the model were applied in the intervention by providing extracts from the symptom of sore throat.

Table 5 Application of the constructs of the Common Sense Model in the intervention

Processing system	Theoretical construct	Application of the construct in the web-intervention: example - extracts from the sections of the symptom of sore throat
Cognitive Illness Representation:	Identity: What is it?	Section 4: Your personal diagnosis report These are symptoms of an infection of the throat or tonsils and as the picture shows, they are two small sacks (or glands) at the back of your throat (...) Sore throat is usually one of the first symptoms of a cold or flu.
	Cause: What caused my symptoms?	Section 5: Do I need to see the doctor for these symptoms? Symptoms of a sore throat, or pharyngitis (the medical term for an infected throat), are caused by viruses. There are available treatments that provide relief from these symptoms. You do not need a prescription for such treatments so we have provided detailed advice on the following pages.
	Timeline: How long would my symptoms last?	Section 7: When should my sore throat clear up? GPs find that by the time they see patients with sore throats, they report that on average: - It starts to get better after 5 more days (i.e. 8 days from when it started) - It can last between 2-3 weeks in total Sometimes your symptoms may start to clear, or clear completely, and then come back again after a short while. This can be because the original infection is taking a bit longer to finally settle, but often it means you have had bad luck and caught a new virus. This may then need a few further weeks to clear.

Table 5 (continued)

Processing system	Theoretical construct	Application of the construct in the web-intervention: example - extracts from the sections of the symptom of sore throat
	Consequences: What is the impact of my symptoms?	<p>Section 4: Your personal diagnosis report</p> <p>Sore throat is usually one of the first symptoms of a cold or flu. Sometimes it is accompanied by headache, cough, temperature or fever.</p> <p>Section 5: Do I need to see the doctor for these symptoms?</p> <p>Symptoms of a sore throat (...) can be quite painful and uncomfortable. However, the symptoms you have at present are not a sign of a serious illness that needs to be seen by the doctor.</p>
	Control or Cure: Can I control or cure my symptoms?	<p>Section 5: Do I need to see the doctor for these symptoms?</p> <p>There are available treatments that provide relief from these symptoms. You do not need a prescription for such treatments so we have provided detailed advice on the following pages.</p> <p>Section 12: Advice on relieving your sore throat</p> <p>We have put together several advice suggestions based on medical evidence and what has been found useful by people with similar symptoms. Tick the advice you want to see.</p>
Emotional Illness Representation:	How do I feel about my symptoms?	<p>Section 11: Do you think your symptoms might be a sign of something more serious?</p> <p>Some people think their symptoms may be a sign of a serious condition and want to know more about these illnesses. We have listed the most common conditions that may be a cause of concern for their symptoms of sore throat. Just tick on any of these if you want to find out more.</p>

Beliefs about Medication

The Common Sense Model has also been applied to the study of treatment beliefs and particularly medication beliefs and medication use. As seen above and in chapter 2, the model postulates that individuals base their decisions on how to deal with their symptoms on their understanding and beliefs about the nature, duration, causes, consequences and potential for cure or control of their illness. Taking medication is one of a number of possible ways of coping with an illness (Leventhal *et al.*, 1997), thus the decision about whether or not to take medication, e.g. antibiotics or over-the-counter remedies, is based on experiences (e.g. past illness and/or current symptoms) and personal beliefs about the illness (Leventhal *et al.*, 1992). Horne (1997) added that such decision is also influenced by beliefs about the particular treatment. There are two stages through which views about the necessity for a particular treatment go through (Horne 2003). The first stage is whether the condition warrants treatment, e.g. “Do I need to take medication for my symptoms?”. Once the decision is reached that a specific treatment is needed for the particular illness, then there is a second stage where the individual needs to decide about the specific treatment amongst other alternatives.

The perceptions about the necessity of treatment and the type of treatment required are linked to the perceptions about illness as specified in the CSM. For example, symptom experience and its interpretation may act as a reminder and stimulate medication use, reinforce beliefs about its necessity, or stimulate concerns if the symptoms are interpreted as side effects after taking specific medication. In addition, necessity of medication is positively associated with beliefs that the illness can be controlled by the particular medication (Horne and Weinman 2002). In a series of quantitative studies Horne *et al.*, (1999) developed a measurement scale of treatment beliefs focusing on medication taking due to the significant problem of non-adherence (Horne 2003). These beliefs were conceptualised in the following four themes: *Specific Necessity* which represented beliefs about the necessity of taking prescribed medication; *Specific Concerns* representing concerns about the danger of dependence and disruptive effects of pre-specified medication; *General Overuse* representing beliefs that overall medicines are being overused by doctors; *General Harm* addressing beliefs that medicines overall are harmful and should not be taken continuously. The authors argue that such concepts can be applied not only for medication use but for other types of treatments as well, such as physiotherapy, surgery and chemotherapy, although the majority of literature has focused on medication use.

The literature on the development of these concepts and subsequently the examination of their relationship to behavioural outcomes has focused on the role of such beliefs in influencing adherence in chronic conditions. The evidence showed a consistent pattern where adherence was positively associated with necessity about medication and negatively associated with concerns for the same medication, in conditions such as asthma, HIV, myocardial infarction and diabetes (Horne *et al.*, 1999; Horne and Weinman 2002).

The study of medication beliefs can also provide insights in understanding and explaining human behaviour regarding people's beliefs in the necessity of antibiotics which in turn may lead to inappropriate demand for prescriptions (Horne 2002). The increased use of antibiotics has led to growing public health concerns about the implications of such actions for antimicrobial resistance (Costelloe *et al.*, 2010; Brown *et al.*, 2012) particularly when considering the evidence of the limited effectiveness in the treatment of RTI as already seen earlier in the first chapter. The literature review (chapter 2) has also shown the range of reasons individuals held for consulting their doctor for their symptoms which included beliefs in the necessity of getting a prescription for a quick recovery and treatment, and to prevent reoccurrence of symptoms. Thus there seems to be an overlap between the area examining demand for medication for RTI, particularly antibiotics, and the work examining medication beliefs in relation to adherence on the beliefs about medication necessity.

Therefore the concepts of medication beliefs suggested by Horne *et al.* (1999) were applied in the intervention. The Table 6 below presents one example for each of the concepts as applied in the intervention. Although the majority of health messages addressed the use of antibiotics, some health messages also addressed people's beliefs and attitudes towards medication in general which included OTC remedies as well.

Table 6 Application of the Beliefs about Medication constructs in the intervention

Theoretical Model	Theoretical Construct	Application of the construct in the web-intervention: example-extracts from the sections of the symptom of sore throat
Beliefs about Medication	Overuse and Harm of medication	<p>Section 15: Frequently Asked Questions- I don't really like taking medications, I feel that they may be harmful to the body:</p> <p>We have not suggested any medications when there is evidence they are harmful to the body. The treatment advice earlier on gives details when some medications have side effects or when evidence is not yet clear. You don't have to take any medications and we have suggested alternative ways of easing your symptoms.</p> <p>Section 15: Frequently Asked Questions- Only antibiotics work for me when my symptoms are bad - without them I will not get better and may get worse:</p> <p>Most common infections and symptoms such as sore throat are caused by viruses, but antibiotics are only effective for some infections caused by bacteria. You may have taken antibiotics in the past and felt well soon after that. This is usually due to the natural course of the symptoms – most people visit their doctor when they have had their symptoms for some time and by then the immune system has started to fight back the viruses on its own, so people are about to get better naturally anyway.</p> <p>Section 10: More information about risks and uses of antibiotics</p> <p>Doctors realise now that the more antibiotics one uses for common symptoms the easier it gets for the bugs to adapt and find ways to survive the antibiotics. They become ‘antibiotic resistant’, so that the antibiotics are becoming less effective at fighting infections and in the future they will no longer work for you. So we need to keep producing new kinds of antibiotics that are stronger but this can be very difficult, takes a lot of time and it is very costly.</p>

4.3.3 Tailoring of the information

This section discusses how tailoring was applied in the cold and flu-type symptoms intervention and in particular which sections of the intervention were tailored and on which variables. One of the main features of tailored communication discussed earlier in chapter 1 is its capability in providing messages that are individual-focused. However, if there is uniformity of needs or preferences within the target population, then there is little need to develop tailored messages as they will address similar, if not the same, issues. In addition, considering the cost, time and effort involved in creating tailored communication, compared to the other commonly used approaches, it is more efficient to apply tailoring under certain conditions (Kreuter *et al.*, 1999). Therefore, the web-intervention of this research contained information that was tailored on specific variables which varied amongst individuals as observed from the literature. In particular, the health information was tailored based on medical screening questions and theoretical constructs explained in each section below. The intervention also contained information presented to everyone, or generic information, such as the introduction page and the list of scientific references used to develop the health messages. Some of the generic information provided the opportunity to the participants to select and combine information from a range of options rather being presented with everything at once thus giving the individuals more control of what they were going to see. Each of the tailored sections is presented first followed by the sections presenting the generic information.

Tailored Sections

Section 2 (Which symptom is bothering you most?) presented participants with a list of five symptoms and they were asked to indicate the one that was bothering them most.

Section 3 presented a list of medical-related screening questions tailored to the symptom selected in the preceding section. The participant was able to proceed to the next question only if the previous question was completed. For the symptom of ear-ache there were extra screening questions to distinguish symptoms related to otitis media and to otitis externa. For the cough symptom, as already mentioned earlier the participants were also asked to describe their cough by selecting from a list of cough-related symptoms, i.e. getting a tickle or an itchy feeling in the throat, deep hacking cough, having a pain in the chest when coughing, coughing up phlegm, wheezing and rattling when coughing.

Section 4 provided the diagnosis tailored to the questions answered earlier in Section 3. Each symptom had its own diagnostic report. For the ear-ache there were two diagnostic reports: one for otitis-media and one for otitis-externa. For the cough there were three diagnostic reports: the first one focused on the cough symptom described as getting a tickle in the throat; the second diagnostic report addressed the cough symptoms described as a deep hacking cough and getting a pain in the chest when coughing; the third diagnostic report addressed the descriptions of coughing up phlegm and wheezing and rattling when coughing. Each diagnostic report represented three different types of cough: dry cough, deeper cough, and cough with phlegm thus the diagnosis section grouped some of the cough descriptions together.

In *Section 12* participants received advice on what to about their symptoms. This was presented as two options: things you can do yourself, and things you can get from the chemist. Participants could select one or both sets of advice and the split was based on the research on what people do to manage their symptoms. The literature from chapter 2 suggested that people self-care for their symptoms and use remedies from home and/or from the pharmacy thus it was important to provide both options. Furthermore, the theory on medication beliefs, seen earlier above, argues that some people hold strong views against the use of medication in treating their symptoms. The separation of the two advice options also avoided to present them together in a lengthy page that would contain irrelevant points for some and possibly reduce attention (Kreuter *et al.*, 2000; Noar *et al.*, 2009). Similarly to the diagnosis in Section 4 above, different advice was given for the two types of ear-ache. For the cough, there were three different health messages on what to do based on the three diagnostic reports presented above. The suggestions in the advice were derived from various resources as noted in the materials (section 17) and tailored for each of the 3 groups of cough symptoms.

Some of the advice overlapped across the three groups of cough symptoms, e.g. avoiding smoking atmosphere, drinking lemon with honey or drinking plenty of fluids. These suggestions were based on anecdotal evidence of what individuals find helpful and soothing rather on evidence-based work.

In *Section 13* participants were presented with further options for other related medical problems they might have experienced concurrently with the main symptom they have selected at the beginning. This was based on the findings from the literature where

individuals may experience other secondary symptoms in addition to their main symptom (Gonzales 2003).

Generic Sections

The remaining nine sections (1, 5, 7, 8, 9, 11, 14, 15, 17) the participants viewed included health messages that were identical for everyone. As mentioned earlier, the first section of the intervention introduced the reader to the subsequent sections whereas the last section (section 17) contained the references used to develop the evidence-based health messages. Thus it was considered that there was no reason to tailor these sections. Section 7 and 8 addressed the questions of when the symptoms would clear up and whether seeing the doctor would help, respectively. The majority of people have a specific time framework in mind of when their symptoms should clear and usually this duration is much shorter than what the health care professionals suggest (Cornford 1998; Frostholm *et al.*, 2005). Related to that is the belief and hope that seeing the doctor could speed up recovery and shorten the duration of their symptoms. Therefore these sections were not tailored as it appears to be a shared concern by a significant number of people. Section 14 provided advice on how to help the immune system fight the infection and improve general well-being. The section was presented as a range of information ‘tips’ individuals could do in general for their immune system rather for their individual symptoms only. There was no evidence from the reviewed literature that people varied on any specific theoretical, medical, or psychological factor on the specific content, thus it was presented as a generic section. The four remaining sections (5, 9, 11, 15) also provided the opportunity to the individuals to select, amongst various options, what they wanted to read or if they wanted to read further on in addition to the generic information. This is not considered as tailoring as no specific variables were chosen to tailor the messages. Rather it was a format where individuals were able to select to read what they wanted and felt appropriate at the time.

In detail, *Section 5* included information on ‘What to do about my symptoms’ and whether there was a need to seek professional help. This was based on the literature suggesting that one of people’s thoughts when dealing with their symptoms is whether they need to seek professional help (Cornford 1998; Wang 2003). The section also provided the option to the participants to check further whether they needed to seek professional help if there was still uncertainty about their symptoms. Section 6 provided the health message to that request.

Section 9 provided information addressing the question ‘Would it help to try antibiotics for my symptoms?’. The content addressed beliefs about medication, and in particular the necessity of taking antibiotics for the selected symptom, drawing from the literature on medication beliefs (Horne *et al.*, 1999). Similar to Section 5, the participants were able to select if they wanted to view further information about the risks and benefits of antibiotics. This selection, and the subsequent content of the health message in Section 10, was based on the beliefs about medication theory mentioned earlier. The theory proposes that individuals when faced with the decision of taking particular medications, they engage in a cost-benefit analysis where the risks of taking the medications are weighted against the benefits gained (Horne *et al.*, 1999).

Section 11 again addressed the issue on whether participants were unsure of their symptoms and in particular whether their symptom suggested something more serious rather the diagnosis they were given earlier on. The participants were presented with a list of conditions that had some overlapping symptoms with their earlier diagnosis and were able to select one or more conditions from the list to see further if there was any cause of concern. The literature suggests that one of the reasons people consider consulting is whether their symptoms could be related to something more serious than a self-limiting illness; such concern may be linked to previous personal experiences or risk in the family thus feeling more susceptible (Cornford 1998; van de Kar 1992).

Lastly, *Section 15* appeared in the form of a list of Frequently Asked Questions (FAQs) where participants could select to read any of the listed question-statements. The participants were presented with feedback addressing beliefs and attitudes towards their symptoms and towards a range of treatments, as well as past experiences with the same or similar symptoms. Both the questions and the subsequent feedback focused on theoretical constructs such as medication beliefs (Horne 1997; 2003) and beliefs about own abilities in managing symptoms (Bandura 1997; 2000) as already seen earlier in the Theoretical Constructs of the intervention. In addition, feedback addressed questions on specific medical aspects of treatment, e.g. ‘Is it safe to take Paracetamol and Ibuprofen together?’, which were suggested by the health care professionals overseeing the medical content of the intervention.

4.4 Summary

This chapter presented the components of the cold and flu-type symptoms website intervention together with the underlying rationale for their inclusion. In particular, the chapter described the structure of the intervention, the content of each page and the areas informing their development. The elements of this intervention fall into the category of internet interventions as defined and discussed earlier in chapter 1, such as designing a structured and self-guided program which provides information, self-assessment with tailored feedback, and support for self-care of the five target symptoms. Finally, as already seen in the systematic review (chapter 3) there are many interventions aiming to promote self-care and reduce consultations for minor ailments in general or respiratory tract infections in particular. However, the unique points of the cold and flu-type symptoms website intervention compared to the existing interventions are: the explicit use of theoretical constructs to develop the health messages based on models involved in health behaviour change; the use of tailored design in presenting the health messages; the potential use of the internet to deliver the health messages.

The next chapter presents the qualitative pilot study of the intervention materials with participants providing their feedback as they go through the various stages of the materials. This would help to identify areas that would need further development and provide an insight to the level the content matches participants' needs and requirements.

Chapter 5 The usability and acceptability of the tailored web intervention: a qualitative study

5.1 Aim of this chapter

This chapter presents the pilot study of the intervention materials aiming to elicit peoples' feedback on the usability, comprehension and acceptability regarding its content and format. Previous work on developing web- and computer-intervention programs highlighted the importance of ensuring the program is easy enough for the users to understand and use (e.g. Proudfoot *et al.*, 2003; Lin *et al.*, 2009), in addition to assessing its effectiveness, as these can influence people's decision in using the intervention. As this is the first stage of developing the proposed web intervention, the study focuses on the issues of usability and acceptability and it does not assess the efficacy of the intervention in influencing behavioural outcomes, e.g. the decision to seek healthcare. A qualitative approach was used to explore people's views and thoughts about the intervention to enable to gain a wide perspective of the issues they consider important which would also feed into improving subsequent versions. The data were elicited through interviews consisting two parts: the data from the first part on the individuals' experiences of cold and flu symptoms are presented and discussed in chapter 6 and the second part, focusing on their views about intervention, is presented in this chapter.

5.2 Method

5.2.1 Design

The study used a qualitative interview schedule with open ended questions. The protocol was approved by the Ethics Committee, School of Psychology at the University of Southampton.

The questions were part of an interview schedule which had two parts. The first part explored the factors and the processes involved in people's decision-making when they were unwell with cold and flu symptoms and the second part elicited feedback on the first pilot version of the intervention materials. This chapter presents and discusses the findings of the second part of the interview. The first part is presented in chapter 6. The reason for asking the participants about their experiences of being unwell preceding their feedback on the intervention materials was to reduce possible social desirability bias created by reading

the intervention materials first; the latter could have influenced participants' actual stories, for example by seeing how they could have addressed their symptoms.

Data was elicited based on the think aloud protocol method whereas data analysis was based on the techniques suggested by thematic analysis (Boyatzis 1998; Joffe and Yardley 2004). The analysis method is explained in further detail in section 5.2.5.

5.2.1.1 Eliciting data: the think aloud method

This is a popular usability technique that has been used in a wide range of software and online applications (van den Haak *et al.*, 2007; Nyman and Yardley 2009). There are different types of this method, such as concurrent or retrospective think-aloud protocols and both have traditionally been applied for testing computer software and email applications (e.g. Campbell 2001; Jaspers 2009; Makri *et al.*, 2011). Usually the participants are asked to speak aloud the first thoughts that come to their mind while they are viewing and processing information of what they see. This seems to reflect and map the underlying decision-making that takes places while they are interacting with the program applications and viewing new information. Participants may be asked to speak as they go through the material, a concurrent think-aloud method, or retrospectively comment on what they have just seen. A range of sophisticated tracking methods are also used to complement the think-aloud process such as videoing the mouse movements, recording the time spent on particular sites or pages in controlled laboratory settings (Hansen *et al.*, 2003; van den Haak *et al.*, 2003). These methods have been used primarily for transactional software applications (e.g. library catalogues; van den Haak *et al.*, 2004), which require more interaction with the user. Applying these methods though in the rather new research area of usability assessment of informational websites may not provide a fair reflection of the underlying thinking and decision-making. This is because informational websites require more processing of textural information and less physical interaction, such as entering data or combining search terms, thus retrospective or concurrent think-aloud techniques may yield different results under this format. However, Benbunan-Fich (2001) used the think aloud method effectively in assessing the usability of an informational website by capturing people's views while viewing the webpages and similarly, Nyman and Yardley (2009) for a website on falls prevention activities for older people which included both informational and interaction sections. Furthermore, van den Haak and colleagues replicated their usability study of the library catalogues (van den Haak *et al.*,

2004) to a web application program (van den Haak *et al.*, 2007) using the same think aloud protocol and found no differences between the programs regarding the total number and relevance of problems detected. The content of the web intervention of this research is predominantly information with very little physical activity (clicking a few boxes) required from the participants. In the majority of cases of long informational texts, people read in silence and try to find their way round as they have fewer cues for verbalization. Eliciting feedback was based on both the concurrent think-aloud and retrospective methods. In particular, participants were asked to read aloud what they were reading at each point and provide their comments and the first thoughts that came to their mind. If participants were reading aloud but were not commenting, they were asked by the researcher at the end of each page for their feedback. They were also asked at the end of the materials for their overall comments.

5.2.2 Participants

The same participants who completed the first part of the interview about their experiences of cold and flu symptoms subsequently provided comments about the intervention materials. The recruitment procedure is presented in chapter 6. The recruitment advertisements and the information sheet (Appendices 3 and 4 respectively) stated clearly that the interview schedule had two parts and the participants were invited to provide feedback on the content of a new interactive information site. All participants were using or have used a computer in the past to access the internet.

5.2.3 Materials

The development of the content of each webpage is discussed in chapter 4. The initial intention was the development of a website with the materials for each symptom for participants to go through. As mentioned earlier in chapter 4, due to lack of resources to program and develop the website, each page was printed and shown by the researcher in the sequence it would appear on the screen. All pages were coloured and laminated and each symptom had its own separate set of pages (Appendices 8-12).

5.2.4 Procedure

On arrival, the participants completed a consent form (Appendix 5) and at the end of the first part of the interview about their experiences of being unwell, they were asked again if they could go through the intervention materials and provide their feedback.

The researcher read the interview instructions (Appendix 7) and then gave the participants a pen to tick various options in the materials whenever they were asked to; this was done to mimic the use of a computer mouse in clicking through the various parts of the pages.

Participants were encouraged to ‘think aloud’ and if they were not verbalising any thoughts the researcher prompted them to do so. If the participant made a comment that needed clarification, then the researcher probed with follow-up questions.

After the participants went through the materials, they were asked if they had any overall comments and questions. At the end they were asked a short set of demographic questions and given the debrief form (Appendix 6).

All interviews were recorded and their duration regarding the feedback on the intervention materials was on average 50 minutes. They were transcribed by a secretary and the researcher went through all the transcripts whilst listening to the audiotape to ensure accuracy and agreement between the audio and the written text, as well as to enable critical reflection of the interview questions and style. The participant identity and any other names mentioned during the interview that might have revealed the source of such information were deleted. To ensure data protection, all digital interviews were saved on a CD which was stored separately from the paper transcripts and the list of the participants.

5.2.5 Analysis of the think aloud data

Participants were asked to tick one of the five symptoms available thus they would see and comment on one of the five sets of the webpages available. Each interview was transcribed into a Word document and a separate document, for each of the five symptoms, was created. All five documents containing the webpages of their corresponding symptom together with the excerpts of comments made for each webpage. Some symptoms were more frequently selected, e.g. cough and sore throat (n=7), sore throat (n=5), runny-stuffy nose (n=5) than others e.g. ear ache (n=2), sinusitis (n=1) thus the range of feedback varied.

The analysis started after the first few interviews were completed in order to enable reflection on the interviewing style and identify any areas that could be improved in the subsequent interviews. This process helped to add further prompts at certain points to encourage elaboration when participants were giving short comments. The feedback was

coded based on techniques proposed by thematic analysis to obtain a summary of recurring themes across participants for each symptom. Thematic analysis is a process for encoding qualitative data and facilitates in identifying patterns in a systematic way (Boyatzis 1998) thus helping to analyse and cluster the participants' views regarding the usability and acceptability of the website. This method has also been used in other studies investigating acceptability criteria of web-based programs (e.g. Kerr *et al.*, 2006; Yardley and Nyman 2007).

The analysis process underwent the following stages:

At the first stage, the transcripts were read thoroughly to gain a good understanding of the data and label each meaningful phrase. The data from each of the five symptoms were coded inductively, i.e. codes were created and clustered within emerging categories based on the actual data rather than based on pre-imposed classification and were exclusive i.e. the data could only fall under one code. Similar comments were identically coded and kept separate. Overall initial coding generated 364 codes across the transcripts and symptoms. There were instances where the materials prompt participants to remember symptoms and past experiences that were related to the issues discussed during the first part of the interview e.g. what the doctor has told them during the consultation or additional symptoms they had. Since such comments were part of their experiences of being unwell they were not coded for the analysis purpose of this study and were instead transferred to the analysis of the first part of the interviews.

At the second stage, codes were filtered by retaining those that were both relevant and recurring. For relevance, codes were excluded when participants expressed general interest in the research topic; expressing speculations of what other people may think of the materials rather their own opinion; offering advice suggestions they personally found useful for their symptoms. As the aim of this study was to elicit feedback in order to improve the intervention materials, the analysis focused particularly on the negative and constructive comments, which could further inform the development of the intervention.

Recurring codes were retained if they were identified in more than one participant's transcript. In order to identify whether codes were recurring across the web-pages regardless of symptom, each code was written on a strip of paper with the symptom it was related to, the section the comment referred to, the page number of the transcript, and the

identity code of the participant e.g. code: “Common sense information – already know about it” cough/ advice / p5/ CH

The materials were split into the following 12 sections to aid with the sorting of the codes. The sections were split based on the title and content of the web-pages: Introduction; Screening; Diagnosis; Do I need to see the doctor for my symptoms?; When should my symptoms clear?; Will it help to try antibiotics?; Will seeing the doctor help with my symptoms?; Do you think your symptoms may suggest something else; Having further symptoms; Advice; Helping the immune system; Frequently Asked Questions. Thus the codes were classified under each section which helped in assessing the recurrence of each code.

The participants’ overall comments made at the end were analysed following the same analysis process. In case the comments were not associated with a particular page they were analysed and classified as overall comments. In addition, any comments made at the end that were already mentioned earlier when viewing particular pages they were added to the earlier overlapping comments reinforcing the identification of existing codes but not adding to another code occurrence.

The stage of analysis described above assisted clustering the codes into sub-themes, which in turn assisted to cluster similar sub-themes into themes. Under each theme, the sub-themes were grouped based on whether they applied to only one web-page or across several web-pages.

5.3 Results

The results of the analysis of the think aloud data are presented below in two sections. The first section presents the positive comments and the second section presents the negative comments. There was no pattern differentiating participants on those two dimensions in respect of their background demographics and educational status. Comments also addressed both the appearance and format of the materials as well as the content of intervention. Extracts from the interview transcripts are given for most of the themes and sub-themes to illustrate the points made.

5.3.1 Positive comments

The analysis of the positive comments identified 6 themes, shown in Table 7. All the positive comments made addressed more than one section of the intervention. In addition, no new positive comments were made at the end of the materials thus no further unique theme was identified. Therefore, all positive comments made both for the individual web-pages and overall, were merged and analysed together.

Participants expressed uncertainty of when to seek professional help thus they welcomed the information in the introduction on getting help with their decision-making. This was particularly welcomed by individuals who felt that their symptoms were sometimes vague and they had to see their doctor in order to be sure what was troubling them.

That's helpful as well, make sure your symptoms are clear, coz often can be pretty vague, when to go to the doctor and if you don't go to the doctor then you won't know at all (...) Coz then if you actually really worried about it and you want to go and see the doctor you can go there to get more information... (TB)

They felt they were getting advice from a credible and trustworthy source with the 'Who is providing the advice' section (e.g. section 1 – Appendix 8) making the information more valid. In addition, they felt reassured getting a diagnosis with an explanation on what their symptoms indicated as well as the opportunity to check further if they suggested something else potentially more serious (e.g. section 11 – Appendix 8).

I do like the part it says why you cough and so...you are put at ease because you know...what it is and what is happening so if you don't know what's happening to you then it can be...make it seem a lot worse than actually is (RW02)

I think the question thing is the most helpful thing, because it kind of leads people to, kind of think more about what's going on and then be able to get further advice on that...yes...that's good (SW)

A lot of the information and advice in the materials matched individual's personal experiences that enhanced trustworthiness towards the advice and created positive attitude for the subsequent pages.

Diagnostic questions: your personal diagnosis. These are symptoms of an infection of the sinuses, uh huh ... the sinuses, the cheekbones and forehead ... right, OK, yeah, that, that describes what I find, perfectly. (RW01)

I would read this and I would see many things that I do by myself and I would say, Oh, I'm doing it good, oh, I have done this...oh, nice, oh, yeah...my mum told me to drink honey and uh...lemon and things like that...so...I guess people will...feel identified with these things...

(FV2)

The most frequent positive comment made was about the symptoms that were listed at the introduction e.g. feeling under the weather, and statements regarding their impact, such as interference with daily life (e.g. section 1 – Appendix 8) and the implications of deciding to see the doctor e.g. waiting at the surgery with other unwell people. Identifying with the provided information also included the sections on diagnosis (e.g. section 4 – Appendix 8) and advice on what to do, particularly about the information regarding over-the-counter medication for cough (e.g. section 12 – Appendix 8).

Participants also commented on the advantage using the web materials as a reference to check for symptoms in the future as well as being able to monitor changes of current ones rather being unsure on what to do and whether they had to seek professional help.

That's good, yeah, I think that's important, that's could be...yeah...it is important to understand and it is good that you can get more information as well so if other symptoms develop you can...you know when to see a doctor (TB).

that's pretty good 'cause sometimes you have like conflicting advice about things (...) OK...and I like the bit that says at the bottom about if you are still unsure "what symptoms mean you should see the doctor, you should get more information", that's good because most of the time you are unsure about do you need to see a doctor or not?
(AH)

Table 7 Comments identified overall and across web-pages

Positive comments
Helpful, reassuring and trustworthy information
Identify with information provided-matching personal experiences
Future reference for further symptoms
Accessible from home
Information to the point
Learning new information
Having such information readily accessible at home was positively commented rather than having to go to see the doctor especially when being very unwell. Easy accessibility ensured that they could check for their symptoms early on rather than waiting before possibly things getting worse.
Good being able to access the information for help anytime particularly when symptoms change, it can be confusing and upsetting (CR06)
Having information in simple language and easy to understand was frequently positively noted, for example when reading the first paragraph of the introduction (e.g. section 1 – appendix 8) and getting the diagnosis for their symptoms (e.g. section 4 – appendix 8 for cough). Participants also welcomed having pictures which helped to convey messages much clearer (e.g. section 4 – appendix 12 for sinusitis).
..the first three questions sound pretty to the point...that was pretty good (CH) It gets really good that it explains what is actually happening and like...there is a picture and it explains you know in simple English that you can understand what...what you actually have. I think that's really good. (TB)
A lot of the participants commented on seeing information and advice they were not aware of, particularly about the duration of certain symptoms such as cough (e.g. section 7- appendix 8), which it was viewed as being longer than they originally assumed, and about the evidence quoted for various remedies such as vitamin C and Echinacea (e.g. section 14 - Appendix 8).

Thought it would have been a lot quicker, didn't realise it took that long
actually...most people would have worried for taking that long....it reassures me
(JA22)

Well...I guess Vitamin C is not quite so useful as I thought it was. So it was a tasty
placebo (PB)

In addition, they welcomed having new information in the format of the 'Did you know'
format (e.g. section 4- Appendix 9) as it was short and easier to remember.

I like the general idea of...a description a sort of the fact that "did you know" ...um ...
just my personal reaction because...I'm curious about things like that, so I like doing
that, I like reading those (JT06)

5.3.2 Negative comments

There were three main themes arising from the negative coded comments: format, reaction
on 'what to do advice', and suggestions on changing the content.

As Table 8 shows, the first theme 'format' included eight sub-themes, five identified on
more than one webpage and three on one webpage only. The majority of the participants
perceived the text, particularly the information on antibiotics (e.g. section 10 – Appendix
9) or the output information related to checking for further symptoms (e.g. section 11 –
Appendix 9) as monotonous thus they suggested adding graphics and colour would make it
more attractive and easier to read.

(...) maybe put some picture, even if it's just a cartoon or something, because I guess
it's uh...a long text and if you put something here between even if it's uh...a picture, a
cartoon...so...(...) that the person reads this part, gets something that like is taking a
break and then there is a little bit...of text to read. (FV2)

Where you have 'feel under the weather and unwell', maybe have some sort of image
there that conveys how you might be feeling (I: Yeah) when you look at it. Um ... that
may assist, as well, with people who aren't necessarily using English as their first
language too. (RW01)

Most participants found it difficult to read and understand a lot of the terms used in the text particularly the name of medical ingredients for the mixtures provided in the advice (e.g. section 12 'things you can ask your chemist'- Appendix 12). Some felt there was no need to know such terms anyway when going to the pharmacy as they can seek help and advice of what to take from there. This was a comment shared even by participants who were familiar with such terminology from background knowledge.

even though I kind of know what they are from chemistry I haven't done that and I was more the average person who would come across the site and it would make you feel that...you have to know these to then go to your chemist more than asking the chemist for about it (RW02)

Some participants expressed difficulty in navigating through the various materials : the stage they were at and how to get the information they wanted to see. It was unclear how they could return back to the main screening page to select another symptom. Furthermore, there were instances where they wanted to return to a page to compare the information they have previously seen, e.g. comparing advice for different types of cough (section 12- Appendix 8), but they did not remember the exact page or did not know how. This was partly because the materials were shown by the researcher so the participants had very little control how to navigate through the pages and the information.

I wonder whether you can like uh...not a quick go to a specific page but a quick navigation so it will take...will allow you to look at a short sequence rather than the long sequence...(JT06)

In addition, participants made specific suggestions improving the grammar for certain sentences, e.g. 'give advice to help your immune system to fight off infection' rather 'advice to help your immune system' (e.g. section 14- Appendix 8) to enable making more sense of the content.

Table 8 Theme: Format

Comments identified on more than one webpage
Need to add pictures to break the long text
Use of more cheerful colours
Avoid use of jargon language
Navigation
Improving the grammar and flow
Comments identified on one webpage
Adding email facility
Frequently Asked Questions are statements rather than questions
Introduction statements presented as questions

The three sub-themes from the comments made on specific webpages were: firstly, adding an email facility. In particular, a few participants found useful having an email facility at the end by the references page (e.g. section 17 - Appendix 8) so they could communicate such information to others. Secondly, a frequent comment was made for the frequently asked questions that they were presented as statements rather as questions (e.g. section 15- appendix 8).

I just read out these questions but actually they're not questions, they're just statements uh a couple of questions but maybe just statements and attitudes... (ASN)

Thirdly, most participants were confused as to whether they had to answer the questions in the introduction page, (e.g. section 1 – Appendix 8), in order to proceed with the next section or whether such questions were statements to illustrate what the participant could expect to see later on. For example:

- Are you not sure if you need to see the doctor?
 - o How can you tell if your symptoms are a sign of an illness that may need medical diagnosis and treatment?

So some participants started answering the questions expecting feedback if there were taking care of their symptoms appropriately or not.

The second theme focused on Reaction on 'What to do' advice, with seven sub-themes as presented in Table 9. These were comments made for the advice provided for each of the five symptoms, suggestions how to help the immune system and when to seek professional help.

Table 9 Theme: Reaction to 'What to do' Advice

Comments identified on more than one webpage
Too long to wait before seeing the doctor
I know I feel feverish but I don't have a thermometer
Getting contradicting information from health sources
Common sense information – not offering anything new
Comments identified on one webpage
Brand names for mixtures and remedies
No need to know about antibiotics- only ever been given them by a doctor only
Re-arrange advice suggestions
There were four sub-themes related to comments made for more than one webpage. When participants were presented with the information stating the expected duration of symptoms or when to see the doctor (e.g. section 6 and 7 – Appendix 11), there was a lot of disagreement regarding the waiting period. For example, a few participants selected runny/stuffy nose and the majority stated they would see their doctor much earlier than what the intervention stated i.e. that symptoms could take between 2-4 weeks to clear. One reason was because they felt it was impossible to be feeling unwell and wait for that long without being sure if it was something to worry about. .

(Reading from the intervention materials): 'Usually it takes 2 weeks for the symptoms to completely clear up but sometimes they can take up to 4 weeks'. If mine would take up to four weeks I would definitely have gone to the doctor by the end of the week to...or the first week. I wouldn't go in the first week because I'd think ok it might be something simple, it might leave but if it continued I would definitely go to see a doctor, I wouldn't wait. (AH)

Similarly, having a temperature was a sign for a potentially serious infection hence needing a rapid professional input rather than wait for the duration suggested by the materials i.e. three days. Giving information of when to seek professional help and particularly by advising the exact temperature readings was not seen as helpful advice. Most participants were unsure how to assess exactly their temperature and subsequently decide whether to seek professional help (e.g. section 6 – Appendix 11). Having a thermometer around was not common and although they were aware when their body temperature was above normal, they were uncertain whether that was within the critical point they had to see a doctor as noted in the web-pages.

(Reading from the intervention materials): ‘Have you had a high fever, a temperature of more than 38 for these few days?’ I would have to guess at that ’cause I don’t have a thermometer. (CR)

I wouldn’t have kind of the ability to measure or find out what my temperature was....or even bother checking, if I was burning up...it was clear then I probably go to the doctor um...I won’t even bother testing it myself or whatever... (JA)

Some participants commented that the information they were getting from various health sources, including their doctor, and the information from the web-intervention about the effectiveness of vitamin C and cough mixtures (e.g. section 12 and section 14- Appendix 8) was conflicting. This caused confusion and uncertainty about the validity of the information of the materials.

for the advice I think I’m getting from my doctor have to take certain medication...but...there is no evidence to show it works, yet...but we’re keeping told to take it, so... I don’t really understand why...you know...it’s quite weird (MMQ)

I didn’t know about these, because of the idea ‘oh, you should have oranges, you should drink orange juice, because the vitamin C is going to protect you’ all that...and to be honest, I try to eat oranges or I tried to eat other fruits with vitamin C (FV2)

A few participants, particularly those that felt confident in taking care of their symptoms and have not visited their doctor for a long time for their cold and flu symptoms, commented that the advice was not offering any new suggestions they were not aware of from other resources such as magazines or social networks.

for a person to try to find medical information on the internet it means that they haven't found it elsewhere, they haven't found it in a magazine, they haven't found it over...you know by chatting with friends...um...so...maybe I'll be getting some advice that uh...is based on common logic (...) it's helpful if you're reading things for the first time and you're finding things for the first time. In other ways is a bit boring especially for some things that are pretty common sense and you don't learning something new (CH)

Regarding comments emerging from particular webpage, three sub-themes were identified. When participants were reading the various ingredients of mixtures and remedies listed in the 'advice from chemist' they could get (e.g. section 12 – Appendix 8) they preferred having the brand name of the product, which it would be easier to buy, rather the specific ingredients which were less familiar to them. This was also related to the sub-theme of avoiding use of jargon language identified in the first theme about the format of the materials.

Upon presentation of the information about antibiotics (e.g. section 9 and section 10- Appendix 8) and the option in finding out more about the risks and uses, some participants felt there was no need in knowing about these as they had no control over when they can get them since they can only be prescribed by a doctor. So they were uncertain why *they* had to know about the potential dangers of antibiotic prescription.

Interviewer: is it something that you would like to find out more about antibiotics?

Participant: um...I don't know...coz you know, I've only ever been given them by the doctor, so I only ever get them if was necessary, you can't buy antibiotics by yourself, can you? (...) it would be interesting I think but I don't know whether it would affect ...like whether to go to the doctor or not... (JS)

Finally, a few participants made two comments about the structure of the advice suggestions. The first related to the specific suggestions within the advice section i.e. re-

arranging the suggestions on what to do by having the most relevant ones, to the symptom in question, appearing first on the list, e.g. seeing first steam inhalation for the runny/blocked nose (section 12 - Appendix 11). Secondly, to bring forward the whole advice section much earlier in the materials, preferable after the diagnosis, and then having the option to read further the subsequent sections.

The third theme, focused on comments and suggestions on ‘Changing the content of the materials’ other than the advice. As shown in Table 10, there were 7 sub-themes under this theme, three identified from more than one web-page and four from one web-page only.

Table 10 Theme: Changing the content

Comments identified on more than one webpage
Too much information
Symptoms change through the day
Still need to see the doctor for reassurance
Comments identified on one webpage
Changing the duration of symptoms at screening
Making questions clearer when to see the doctor
Have additional symptoms at the screening section
Ear ache screening questions confusing

A dominant comment made throughout the web-materials was the length of the information participants had to go through (thus excluding the sections they had the option not to view). This comment was about the sections they had to read before seeing the actual advice on what to do, e.g. ‘Introduction’; ‘When do I need to see my doctor’; ‘Will seeing the doctor help with my symptoms’; ‘Risks and benefits of antibiotics. Some participants even noted that having to read so much made them feel tired and their feedback was less forthcoming.

it's too much for a first page, I'm already bored, ((laughs)) it's too complicated, I'm a simple person...(SA)

Although the majority appreciated having extra information they did not normally get through from doctor, e.g. what causes their symptoms and what part of their body is affected, they preferred having more options in what and how much they could see. Having an option for shorter explanations was preferred especially in situations where individuals are unwell and try to get to the advice quickly on what to do.

I can't be bother to look at that, it will take me half an hour; I would look at it when I have a bit of time and then they forget round to it...um...it is nice to have some quick answers (JT06)

I think um...put um...like shorter sentences, like you can make another page for shorter one so you can click on if you want more details...(...) and click on which one do you want to look at, (NL)

The first screening page asked participants to select one of the listed symptoms that was bothering them most (e.g. section 2 – Appendix 8). However, some participants found it difficult to make such decision because they felt their symptoms changed throughout the day and they could have had more than one symptom at the same time equally bothersome.

a lot of the time I feel that... it isn't just one thing over another... the...not really an equilibrium but...at some points in the day or during ummm the cold...that one is a lot more noticeable and worse than the other so, it's quite hard just to say that's mainly a cough or a sore throat (RW02)

Often like the symptoms are together and I don't know, I wouldn't be able to tell which one was bothering me the most because everything, the whole thing will be bothering me...(TB)

In addition, for some symptoms e.g. sinusitis the subsequent screening questions (section 3 - Appendix 12) focused on how their main symptom was during the last few days or week whereas they felt their symptom fluctuated in a much shorter period of time, e.g. from day to day, so they were uncertain how to answer these questions.

I don't know, I couldn't really [...] maybe say in three hour space that might be getting better but then 3 hours later probably end up going down again...that's what generally happens but for me it hasn't be a general trend one way or the other (JA)

Finally, although participants were positive in getting information about their symptoms, some felt that seeing the doctor was reassuring and comforting as it was much more personal rather than viewing a website, and less risky than trusting their own self-assessment of their symptoms.

I'd rather go and see somebody rather, um, to get, um, read it off the internet because, um ... the doctor might be able to spot something ... physically ...that's wrong with you which might not be a cold. I mean I don't know how many serious illnesses start with what looks like just a cold. (CR)

because it just seeing the doctor or hearing what you go through it actually gives you a booster ... because, he does like, you go then like...it's not just getting the advice, it's somebody actually reassuring you, (AH)

Related to the participant's uneasiness to rely on their self-assessment, the individuals who had recently visited their doctor for persisting cough and were prescribed antibiotics for other concurrent symptoms they did not consider as particularly bothersome (e.g. ear ache), expressed their concern that self-assessment of the most troubling symptom may be misleading and unable to identify serious symptoms as discomfort may not necessarily reflect severity.

better thing about going to the doctor more than using the internet is...for the other things...ummm...that make an individual case...um...rather than a more general... cough...it can mask something which you might not be able to tell unless it's in person umm...yeah (RW02)

Concerning the sub-themes emerging from particular webpage, the first one was related to the options given under the screening questions regarding how long the individual had the symptoms for (e.g. section 3 – appendix 9). Participants felt the questions did not reflect their personal experiences of actual waiting periods but rather extreme cases, e.g. having

sore throat for over a week, where the individual would have already seen the doctor by then rather than seeking for self-help information.

(Reading from the materials): ‘how long have you had your sore throat’ well believe me if I had a sore throat for more than a week I’d be at the doctor... um...maybe you want to put that for one day, one week (SA)

Participants were not sure if they had to have at least one or all of the listed signs and symptoms when viewing the information when to see the doctor (e.g. section 4-appendix 9). Similarly, a question in the screening section included more than one symptom, e.g. for ear ache, so some participants were not clear if they had to have at least one or all of the listed symptoms in order to answer positive (section 3-Appendix 10).

(Reading from the materials): ‘Do you have a severe headache stiff neck and you avoid bright light even if you have no temperature’...ummm...it might be better if that was [...] put into subheadings... coz you might have a stiff neck but not severe headache...coz I had a headache but I didn’t have a stiff neck or avoided bright lights. (TB)

The majority of participants wanted to see a more comprehensive list of symptoms to select from at the first screening question on ‘Which symptom is bothering you most’ (e.g. section 2 – appendix 10) drawing from own experiences of symptoms they found difficult to cope with when they were unwell, e.g. shivering, general tightness, prolonged headache.

Those selecting to see the materials about earache commented that the screening questions were confusing and unclear. In particular, despite answering ‘no’ to the question on whether they had pain in one or both ears (section 3-Appendix 10), they were later referred to answer subsequent questions that addressed the same symptom again. The researcher had to clarify the question in order for participants to proceed with the subsequent sections.

5.3.3 Overall negative comments analysis

Participants commented on five main areas about the intervention materials as a whole, as shown in Table 11. They expressed their uncertainty of seeking help online particularly if they were experiencing symptoms they never had in the past or differed from past illness episodes preferring to see the doctor instead.

if it was different to normal then probably I'd go to the doctors...if it was different (...) wouldn't go to the web site type of thing (JA)

In terms of the options provided by the intervention, some participants commented it would be useful having the option to print the advice as well as expressing the concern that information had to be constantly updated otherwise it would not be trustworthy. The option to check for further symptoms needed to appear at the beginning of the website i.e. at the screening stage, rather at the end (e.g. section 16-appendix 10) so people would know they have such option from the start.

Table 11 Comments made for the overall materials

Negative comments

Prefer to seek doctor's help if symptoms differ from past experiences

Option to print the advice

The content needs to be updated constantly

State at the beginning that people can check again if have other symptoms

More tailoring of the information

Finally, some participants expressed the need to receive more tailored information, for example at the screening section to add a question on whether it was their second episode of having such symptoms and the time lapse between episodes; at the advice section, to include a question if they have already taken medication for their current symptoms and provide advice feedback considering this background.

To account if have already been taking medication for the symptoms seeking advice and if it's a second episode (FV)

5.4 Summary

This chapter presented the first pilot study concerning the usability and acceptability of the cold and flu symptoms intervention. Qualitative feedback was elicited to identify people's views and suggestions to assess the format and the content of the intervention materials. The comments made provided a useful insight on what users of this intervention may be thinking and assessing whilst interacting with the site.

The majority of the comments were related to the content of the materials. Positive feedback included that the information conveyed trustworthy and reassuring messages which matched participants' personal experiences. This is in line with the theoretical underpinnings of the Common Sense Model (CSM; Leventhal *et al.*, 1984) discussed in chapter 2. Any new information that matches with the existing experiences facilitates cognitive coherence of the new situation and suggests more acceptance and familiarization of the new input, in this case the messages from the intervention materials. In addition, participants considered the intervention as a source they could refer back in case symptoms changed or further symptoms develop. They welcomed new information particularly when this provided reassurance, for example information regarding causal factors and duration of symptoms. The messages were particularly favoured when they were conveyed in simple language as this could facilitate effective comprehension of health messages particularly when the information and advice presented is new to the individual.

Negative feedback related to the content of the materials concerned two themes: Reaction to 'What to do advice' and 'Changing the content'. Related to the 'What to do advice', the health messages regarding the duration of symptoms and the suggested waiting period before consulting the doctor challenged participants' beliefs when to seek professional help. The participants had different waiting periods but in all occasions it was shorter than what the materials stated. Advice in the materials regarding the effectiveness of various mixtures and supplements created similar reaction as it contradicted with personal beliefs about treatment and managing of symptoms.

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The position about individuals' power to shape the consultation outcome is reflected in a wide range of health interventions that have been geared towards educating the public about the risks of antibiotic prescription misuse. Within this framework of interventions, the current intervention materials included a section on risks and benefits of antibiotics. However, some participants questioned the relevance of such information to them and the indirect shift of responsibility concerning the implications of excessive antibiotic use as doctors have complete control over prescribing. In addition, various studies have shown that GPs' perceptions of patients expectations do not match with patients' actual expectations (e.g. Barden *et al.*, 1998; Butler *et al.*, 1998; Coenen *et al.*, 2006) overestimating peoples' demand for a prescription. However, there is some evidence that through interventions, such as national campaigns over the harmful effects of antibiotic use (Goosens *et al.*, 2006; Lambert *et al.*, 2006) and providing information to patients about antibiotics (Thomson *et al.*, 1999; Macfarlane *et al.*, 2002), can reduce prescriptions and consultation visits.

Related to the theme 'Changing the content', most of the participants commented about the length of the information presented in the materials and opted for having options for shorter and longer versions of what they could read. The length of the text was also related to a comment noted earlier under the theme 'Reaction to what to do advice' on re-arranging the advice section by bringing it much earlier in the materials so to reduce the amount of text one had to read before reading about the actual advice on what to do. Having too much text to get through may overwhelm people and it can be one factor to reject the site (Sillence *et al.*, 2006).

Three comments concerned the level of tailoring of the materials: having a wider list of symptoms than what was available on the first screening page; having an option at the screening page with more frequent fluctuations of symptoms than what was provided i.e. participants experienced change of symptoms during the day rather than changes during the last few days or week; adding further questions regarding participants' medical background e.g. if they recently had another similar illness episode or what to do next if they had already taken some medication.

Another comment made by some participants concerned reducing the duration of symptoms at the screening questions in order to achieve a more accurate reflection of their experiences. This highlighted that people were not normally waiting for their symptoms as

long as the intervention materials suggested before seeing the doctor. It is also consistent with the comment made earlier on, under the theme 'Reaction to What to do advice', about the advice on the waiting period and the discrepancy between personal experiences and expert's suggestions. As various usability studies have shown earlier, (e.g. Eysenbach and Kohler 2002; Sillence *et al.*, 2007) credibility and trust to online health information is enhanced when the users can associate their personal experiences with the content. This is particularly important for the text that appears first in the intervention materials, such as the screening questions, as it gives an indication as to the nature of the intervention as a whole and the subsequent information regarding its relevance to the individual.

Other comments included clarifying the screening questions for ear ache and making the information clearer when to see the doctor.

Negative feedback on the format of the materials included writing in a less technical language by avoiding the use of jargon, for example the ingredients of the mixtures and remedies suggested, and to improve the grammar and flow by re-phrasing the sentences making them clearer and more explicit. Furthermore, participants requested an easier navigation facility through the various pages and sections of the materials together with a site map for a quick overview of the content. Although participants positively noted the use of graphics such as pictures and colours, they suggested adding more particularly at the sections where there was long text in order to aid both comprehension of and attention to the health messages.

Two further issues were identified under the theme of 'Format' relating to the presentation of the information. Under the heading of 'Frequently Asked Questions' section, some participants noted that the listed questions were presented as statements rather as questions. A similar issue, from the opposite perspective, concerned the statements in the introduction section which were presented as questions and participants assumed they had to answer in order to proceed further on. Both issues could be addressed by re-phrasing the sentences to make them clearer and more explicit.

Other comments made by the participants concerned changing the structure of the advice suggestions in two ways. First by re-arranging the specific suggestions within the advice section by bringing the most relevant at the top, and secondly by bringing forward the whole advice section much earlier in the intervention materials in order to see immediately

the advice and then decide whether to read the other sections. Some participants viewed the suggested advice as not offering anything new as there was a great overlap with the wide range of existing health information sources. These individuals did not seek professional help for their symptoms for a long time so it is possible the information was not of direct relevance to them and felt confident in coping with the information and knowledge they already had. Finally, a few participants preferred having the brand names of mixtures and remedies in the suggestions so they could get them easily from the pharmacy.

Regarding overall negative comments, participants preferred seeing at the beginning the option of being able to check again for further symptoms rather at the end. Comments also included having the option to print the advice and the need to keep the content updated in order to ensure the user engages in longer-term consultation with the site (Sillence *et al.*, 2006; Marshall and Williams 2006).

Lastly, people preferred seeing the doctor for symptoms they have never experienced in the past or were not sure if they were cold-related, rather seeking help online. This is reflected in the position proposed by the Common Sense Model (Leventhal *et al.*, 1984), detailed in chapter 2, where people try to make sense of their bodily experiences by drawing from related past experiences as well as from environmental factors such as their social network. These in turn can influence people's subsequent coping strategies. Seeking professional help could be a more established coping strategy for unfamiliar illness episodes rather than seeking help online. This could be due to online health resources being a relatively new source for seeking help that has also not been established yet as part of the means that could influence subsequent coping actions. However, as seen in chapter 5, the use of internet for seeking health advice is increasing rapidly (Kwankam 2004) as well as an emerging medium in facilitating behaviour change (Webb *et al.*, 2010). In addition, the usability studies on web-based health sites presented above as well as the work on information tailoring suggest a number of selection and rejection criteria by the users which provide promising evidence in increasing the acceptance and trust towards online health resources and potentially influence subsequent coping actions.

Positive feedback related to the format of the intervention included the accessibility of the information and advice without any geographical restrictions.

The following chapter focuses on the experiences of the same participants regarding their cold and flu symptoms. The participants were interviewed prior providing feedback on the intervention materials to minimize social desirability bias.

Chapter 6 What are the factors that make people seek professional help for cold and flu symptoms?

6.1 Aim of this Chapter

This chapter presents the second of the four empirical studies of this research. It draws on the evidence discussed earlier in chapter 2 which aimed to address the question on why people seek professional help for their cold and flu symptoms. As shown, the literature addresses a wide range of minor ailments but very few studies focus specifically on cold and flu symptoms (e.g. Cornford 1998; Johnson and Helman 2004) or focus mainly on parents caring for their children's symptoms.

The aim of the following qualitative study is to add to the above existing work by investigating the underlying processes of adults' illness experiences with cold and flu symptoms and their subsequent behaviour. This would help a) to assess whether the factors and theoretical constructs identified in chapter 2 are also applicable in this study, and b) whether there are any additional factors that could explain such behaviour and contribute in the further development of the intervention materials.

The study was funded by the Royal College of General Practitioners.

6.2 Method

6.2.1 Design

The study used a qualitative semi-structured interview schedule with open ended questions. The protocol was approved by the Ethics Committee, School of Psychology at the University of Southampton as part of the study presented in chapter 5.

As mentioned in chapter 5, the interview schedule had two parts. The first part investigated how participants coped when they were unwell with cold and flu symptoms, and the second part elicited their feedback on the first pilot version of the intervention materials. This chapter presents and discusses the findings of the first part of the interview. The second part was presented in chapter 5.

6.2.1.1 Grounded theory methodological approach

The aim of the study required a flexible and dynamic methodology that would enable to investigate, in a systematic way, whether a) the arising constructs of the current literature mapped on the data of this study, and b) additional underlying factors may emerge from the qualitative data that explain further the rationale underlying people's decisions to consult or not their doctor for their cold and flu symptoms.

A widely used and established methodological approach allowing exploration of the proposed aim is grounded theory method. The following sections provide a historical background of the grounded theory approach and the analytical processes it proposes in order to illustrate how the aim of the study could be met by the proposed methodology.

6.2.1.2 Grounded theory: theoretical background

Grounded theory is a methodological approach introduced initially by Glaser and Strauss (1967) to describe a process through which close and detailed inspection of a particular issue leads to theoretical development. Thus grounded theory is both theoretical, i.e. an explanation of the phenomenon or the problem in question with insights, explanatory and abstract schemes that go beyond descriptive level, and grounded i.e. theoretical explanation must emerge or be 'grounded in' the available data rather than emerge from predetermined hypotheses and ideas (Henwood and Pidgeon 2003). This process may draw from a range of data resources such as semi-structured interviews, case-study notes, fieldwork and the essence is the identification of views, processes and phenomena which promote conceptual development while being strongly embedded in the data.

At the time of the development and introduction of grounded theory, hypothesis testing was dominated by quantitative measures (Henwood and Pidgeon 2003) which led to developing of theories not necessarily related to the problem domain in question and the context within which it was embedded. Thus Glaser and Strauss introduced a method through which there was a conceptual break from the existing methods and 'served at the forefront of "the qualitative revolution" ...defended qualitative research and countered the dominant view that quantitative studies provide the only form of systematic social scientific inquiry' (Charmaz 2000, p.509).

The development of grounded theory has been marked by a debate regarding its paradigm of inquiry. Such debate has been between, at one hand, realism where there is commitment to scientific process where any theory emerges directly from the data. On the other hand, it is constructivism where theory does not just reflect the raw data but it also comprises reflection and interpretation from the part of the researcher which itself acknowledges the influence of pre-existing ideas and conceptual frameworks brought by the analyst in the interpretation process (Henwood and Pidgeon 1994; Charmaz 1995; Chamberlain 1999). This differentiation and arising debate has resulted in creating two positions or approaches for the analysis and interpretation of the data.

The constructivist revision of grounded theory, as proposed by Strauss and Corbin (1998) and supported by a number of researchers (e.g. Henwood and Pidgeon 1994; Charmaz 1995; Annells 1996; Charmaz 2000), has been adopted by the current study as it was regarded as more realistic to acknowledge the influence of the wide body of existing literature on minor ailments on the interpretation and conceptualization of the data. For example, as discussed in chapter 2, constructs from two popular theoretical models, the Common Sense Model and the Social Cognitive Theory, mapped onto some of the findings of the existing literature thus it was possible these models to influence the interpretation of the new data and not enable to explore new directions of emerging themes. The constructivist paradigm argues for a combination of systematic rigor in analysis with a creative and dynamic element in the interpretation process; the generation of theory through a constant two-way process between data and the researcher's conceptualizations, perspectives and socio-cultural influences (Henwood and Pidgeon 1992; Henwood and Pidgeon 2003). Thus, it requires researchers to remain alert to the influences pre-existing ideas, perspectives and biases could have on data interpretation and emerging theoretical concepts. This serves a dual role where awareness of the preconditions can provide insight of what new emerges from the data as well as a trigger and guide to researchers' sensitivities in understanding and interpreting the data.

6.2.1.3 Grounded theory: analytical process

Grounded theory provides a well established set of principles and techniques to serve the dual role discussed above that guide analysis and generation of theoretical constructs. The following list, drawn from Henwood and Pidgeon (2003) and Chamberlain (1999), outlines the phases and the order through which one analyses the data and which the current study adopted:

- Setting of initial research questions.
- Sampling of the target population – initially this can be purposive to obtain data relevant to the set research questions.
- Open or initial coding to reflect what the data suggest, the level of detail and observations of possible connections and differences between and within participants' accounts.
- Focused coding where the most significant and/or frequent codes are used to sift through large amounts of data. At this stage, the researcher needs to decide which initial codes make the most analytic sense to categorise the data.
- Constant comparison between the data and emerging categories, theoretical propositions and ideas to pick up similarities and differences between them, to ensure these are strongly based in the data and to further refine the properties of the categories.
- As the analysis progresses, sampling of new data continues based on arising theoretical constructs and questions (theoretical sampling) aiming to confirm and elaborate on emerging ideas and add qualitative variety or density to the existing data.

These stages combine both inductive and deductive methods of analysis (Chamberlain 1999) arising from the constructivist revision of grounded theory as explained earlier: it is inductive as understandings, salient codes and categories are drawn from the data rather than analysing the data through predefined constructs and set hypotheses. As the analysis progresses, the researcher actively seeks to make sense of the possible connections and distinctions between the data and to develop hypotheses and ideas of what is taking place. This is an essential stage in developing a more abstract and theoretical explanation of the issues under investigation. Such ideas and priority questions are then tested deductively through further data collection and analysis.

- Continuing to code, making comparisons and sampling theoretically until no further insights and new aspects emerge, i.e. theoretical saturation has been reached.
- Engaging in further axial coding i.e. categories are refined, developed and related to one another, and theoretical coding i.e. moving the analytical story towards a theoretical direction that can sharpen and clarify it further.
- Data analysis is constantly refined and moving towards theoretical conceptualisation by grouping or reclassifying basic categories, refining definitions of core categories, keeping memoranda by exploring emerging ideas and links with theoretical models and existing literature.

Although the above phases may appear discrete and move in a linear direction, they also have iterative and flexible qualities. Throughout there is a gradual development and shift of the conceptual focus from the raw data and maze of coding descriptions towards a more abstract and analytical ordering and categorisation. This is achieved through a cyclical and constant comparative method which intertwines coding, sampling and analysis.

The outlined techniques facilitate the transparency of the whole analytical process so that readers themselves can see how the emerging patterns and concepts link to the raw data. In addition, transparency of this process is achieved by maintaining a reflective stance, or reflexivity, by making explicit pre-existing assumptions and how these could influence the framing of questions, interaction with participants, data interpretation and subsequent analysis. Yardley (1999) argues that if our understanding and experience of the world is influenced by our assumptions, intentions and actions then it is important to identify these and reflect on their impact on the research process and outcome. Examples of such influences could be a power relationship between the researcher and the participant, and the motivation for pursuing the research questions.

6.2.2 Recruitment Procedure

Recruitment advertisements (Appendix 3) were posted at various public places at the University of Southampton and the local community (libraries, community halls, bookstores, youth centres) as well as on web notice boards (University of Southampton online notice board, Gum Tree).

The recruitment criteria targeted people over the age of 16 who might have experienced cold symptoms at the time of recruitment or in the past 6-9 months. A specific time line was set for the maximum duration of symptoms, i.e. having them for no longer than six weeks, in order to reduce the possibility of recruiting people whose symptoms might have suggested other underlying ongoing conditions. Participants had to reside in Southampton and able to read and orally communicate in English. Each participant was given a £5 thank you voucher at the end of the interview.

Interested participants were sent further information about the study (Appendix 4) and upon agreement a face-to-face interview was arranged. Written informed consent

(Appendix 5) was obtained at the meeting and a de-briefing statement was given at the end of the interview (Appendix 6). All interviews were recorded.

The initial aim was to recruit 20 participants to capture a wide range of views and experiences. However, the final number (n=21) was determined by the data analysis when it became apparent when no new themes were emerging i.e. the data reached saturation suggesting that the sample size was adequate for the aims of the study.

At the beginning of the study, the recruitment was based on convenience sampling, i.e. anyone who was interested to take part and satisfied the recruitment criteria. At that point, there was initial interest mainly from university students. As the analysis progressed, purposive sampling was pursued in order to seek perspectives from a more varied sample, thus further recruitment leaflets were posted in the wider community to target older non-student participants.

Further into data analysis, particular patterns started to emerge that led to the development of specific research questions (more details in section 6.2.4.1 Data Coding: process and analysis). Therefore, sampling methods switched to theoretical sampling after 16 participants were already recruited to address the arising issues. In particular, it was aimed to recruit individuals with specific background characteristics, i.e. young participants aged 18-25 years that were still living at the parental home and have not moved away from home at the time of the study recruitment. Recruitment efforts were therefore tailored to target the particular group.

A number of youth centres in Southampton were identified (e.g. Connexions, No Limits) and personal visits were made to talk about the study with the local managers and emphasise the interest in the particular group. Leaflets and contact details were also left and follow-up phone calls were made again every 2-3 weeks intervals. In addition, one-to-one requests were made to personal contacts. However, identifying and recruiting such group of people proved difficult despite increased efforts of advertising the study. At the end, only one participant was recruited satisfying the new criteria. After extending the recruitment period by three months and exhausting available contacts and resources, it was considered that the time was better spent in analysing the data already collected.

6.2.3 Interview Schedule

As already mentioned earlier, the interview schedule had two parts for all participants. For the first part, a semi-structured interview was prepared with open-ended questions, following a review of the literature, and probes to facilitate discussion (presented in Table 12). At the end of the first part, participants were then invited to go through the pages of the web intervention and provide their feedback. The interview schedule and the findings of the second part are discussed in chapter 5.

The questions were first piloted with a few volunteers and minor modifications were made subsequently. Data emerging from some of the early transcripts influenced follow-up and probe questions without altering the main areas of interest. In particular, at the beginning it was intended to interview people who had and others who had not considered seeing their doctor during their most recent experience of cold and flu symptoms. However, during the first few interviews, it became clear that most of the participants had *not* considered seeing their GP during their latest cold incidence (n=13); they addressed their symptoms mostly by self-care. Thus, a further question was added asking the same people for any other past instances of having cold and flu symptoms where they considered seeking professional help. This additional probe elicited experiences of seeking and not seeking professional help from the same participant and enabled exploration of possible commonalities and differences within and among participants' narratives. Therefore, rather than the interview focusing just on the latest cold experience, it captured a range of experiences and subsequent reactions.

Table 12 Semi-structured Questions

Questions:

1. Can you tell me all about your most recent experience of having cold and flu symptoms where you considered seeing the doctor? (regardless if you actually saw him/her at the end)

If participants had no such experience recently, then they were asked:

2. Can you tell me all about an experience (of cold and flu symptoms) you had in the past where you considered seeing the doctor? (regardless if you actually saw him/her at the end)

Follow-up: Can you tell me (more) about the impact of your symptoms on the things you normally did at the time?

3. Can you tell me all about another time where you did not consider seeing the doctor for your cold and flu symptoms?

Action taken for the symptoms

1. Can you tell me all about how you took care of your symptoms?
2. Can you tell me about any advice or help you got?
3. What made you seek this advice or help?
4. How did you find the advice or help?

6.2.4 Analysis

The interviews lasted on average 20 minutes and were transcribed immediately after to ensure accurate interpretation of ambiguous or unclear sections. Data collection and analysis were conducted concurrently; the analysis started as soon as the first interview was transcribed.

The same transcription process was followed as in the other part of the interviews described earlier in chapter 5. The researcher read through each transcript line by line whilst listening to the audio-interview to ensure the transcript was accurate as well as to enable reflect on the interviewing technique and on the emerging patterns of the data. The pages and lines of each transcript were numbered to allow for referencing at the coding stages.

Each digital interview and its corresponding paper transcript were given a code which could be linked to the participant's name. The safety and storage procedure of the audio-recorded interviews was the same followed as for the interviews of the previous qualitative study in chapter 5.

6.2.4.1 Data Coding: process and analysis

The following analytical process was used, drawing from the techniques and procedure suggested by grounded theory, to develop refined categories and constructs from the raw data.

- Following each tape transcription, I reviewed all the material and study notes and immersed myself in the data by analysing and coding the narrative at a detailed level. The unit of coding, ‘the most basic segment of the raw data that can be assessed in a meaningful way regarding the phenomenon’ (Boyatzis 1998, p.63) was defined as a phrase or sentence representing a meaningful chunk of information.
- Descriptive labels were given to each coding unit and overlapping units were clustered together to form coding categories. The labelling of the categories was, in most cases, similar to the initial codes. In vivo data complemented the coding at this level to provide a more focused description of the data.
- Each coding unit was coded exclusively into just one category to enable making comparisons between various aspects of the content. At the beginning of the coding process, there were instances where the unit could be coded into more than one category. However, as the analysis process progressed with further data and as the definition of each category was refined and elaborated, such overlapping was greatly reduced. In cases where some codes could still be classified in more than one category, then a decision was made to which one category to be classified under with a note justifying such decision.
- The first five transcripts were read and re-read to familiarise with the data. Codes were created as a short description or summary of each action or thought expressed by the participants. These initial codes were kept as active as possible (e.g. seeing the doctor; symptoms getting worse) as one way to stay close to the data and reduce any inferences made by the coder.
- The emerging codes were noted at one margin of the transcript whereas any observations, links, thoughts or further questions the coder had were noted in the other margin.

- Each initial code was then copied onto a strip of paper with its corresponding line number and participant code. This process was repeated for all five transcripts and over 300 open codes were created in total.
- As described in step 2, open codes were clustered together into categories which were defined based on their content. Thus a new list was created of 43 categories comprising of the initial codes with the participant codes and line numbers enabling key issues and concepts to be identified on which data could be examined and referenced. A coding framework was then developed where material could be sifted and sorted.
- Initial coding continued with the remaining transcripts as well. It has been suggested Charmaz (2006) to use the draft categories from the initial transcripts to code the remaining of the interviews while checking for new themes. However it was felt that using the pre-existing categories might have imposed on the coding of the subsequent transcripts. Thus the coding of the latter transcripts continued independently without referring to the initial categories.
- At the end, when all the transcripts were coded, the codes of the remaining transcripts were checked against the categories created from the first 5 interviews. In case they could not be classified under any of those categories, they were checked if they could:
 - a) Create new categories; this lead going back to all transcripts to review data again if can identify extracts for the new categories
 - b) Adjust existing categories: redefine and elaborate the definition of the existing categories to provide a more comprehensive and accurate representation of the codes. All transcripts were checked again to review data and ensure the categories were grounded in the data.
 - c) Excluded from the analysis: Not all codes could be classified – building the overall picture by piecing together data was not just based on aggregating patterns but also weighing up the salience and the dynamic of the issues. There were a few instances where certain codes occurred only once. The list was revisited as the analysis progressed to check whether such codes could match with any of the existing categories and if not, whether they made any salient point. At the end, a handful of codes (twelve) were excluded from the analysis.

- There was a cyclical process where the researcher moved between transcripts, making comments, drawing links, interpretations and summarizing. The categories were re-defined and codes were regrouped as new categories arose and others were dropped.
- The reliability of the coding framework was checked by having a second independent coder going through the transcripts and checking whether the initial codes provided a true and accurate reflection of the raw data. Disagreements were discussed and resolved at the end between the two coders. However, the concept of consistency checks in qualitative research is contested (Armstrong *et al.*, 1997) as it is argued it does not establish the objectivity of the coding but rather the sharing of the subjective interpretation of the data by two people (Yardley 1999). Nonetheless, this process encourages the subjective interpretation of the data to be made explicit and unravel the logic underlying the assignment of the codes to the particular text (Joffe and Yardley 2004).
- Theoretical sampling: Key characteristics of the data were pulled together to help map and interpret the data as a whole. While this process was grounded in the data, at the same time emerging questions were noted that could be pursued with further data collection. In particular, it was noted that younger participants (i.e. 18-25 years) were more likely to have consulted a health care professional recently for their cold and flu symptoms rather older participants (i.e. over 30 years). It was also noted that the younger group were also students and for most, being at university was the first time living away from home. Thus, it was not clear whether the decision to seek professional help was due to being young, hence possibly having less experience with illness symptoms, or whether it was because they were moving away from home which was considered as a support network and an important source for advice and coping when unwell (Scambler *et al.*, 1981). Subsequently, more data was collected in an effort to address the following questions:
 - a) Are young participants' illness experiences with colds different from the older participants?
 - b) Are younger people first moving out from home more likely to seek professional help for their cold symptoms than younger people that have not moved out of the family home yet?

The researcher went also back to the first transcripts and compared the narratives of younger and older participants, the codes and their categories in order to investigate further whether there was any connection and evidence for the first hypothesis. As mentioned under Recruitment Procedure section earlier (section 6.2.2) recruitment difficulties did not allow extensive exploration of this direction.

- When no further new themes emerged, data collection stopped. The analysis continued and categories were further refined and reduced becoming more responsive to emergent and analytical themes. The new categories were mapped onto a diagram in order to help look for conceptualizations which could encapsulate and represent the diversity of experiences, circumstances under which they were unwell and their decision to seek professional help. This assisted in building a picture as a whole where data were 'lifted' to more abstract concepts but could be linked and traced back to the original text. This process led to the development of five factors which are discussed in detail in the Results (section 6.3).

Reflexivity

Notes made immediately after the interviews and during the analysis assisted the reflection process. In particular, the literature has shown that people are made well aware of the limited health resources, and time available to GPs at one hand, and the increasing demand on the other (Irvine and Cunningham-Burley 1991; Rogers *et al.*, 1999). Thus people by admitting they consulted for symptoms that were later diagnosed as 'just a cold' may be viewed as wasting limited resources and almost carrying a stigma for seeking professional help for a problem that in the end was not viewed as medically serious. Therefore, this might have made participants to anxiously portray themselves as individuals who put effort in trying a number of self-management things and wait before deciding to seek professional. In addition, they might have felt the need to justify and defend such decision as thoughtful and due to genuine concern rather than making a quick and thoughtless decision. Although the introduction and the explanation about the rationale of the current study emphasised the interest in people's experiences of cold symptoms without any further reference to the wider consequences of seeking professional help, participants might have made an implicit link to the health resources constraints. Furthermore, decisions to seek professional help for other accompanying non-cold symptoms, e.g. mental health problems and loneliness, might not have been raised if they considered them as not relevant or socially acceptable to admit.

During some interviews, the researcher was asked to provide an opinion on medical issues, e.g. whether taking certain herbal tablets would not interfere with conventional medication. This created the question about the motivation of some participants to take part in the study as well as the possibility of social desirability bias assuming the researcher had a medical background. Thus, at subsequent interviews during the introduction I emphasised my non-medical background and this was repeated if further questions were asked during the interview.

As mentioned earlier, some constructs of the Common Sense Model (CSM) mapped on the findings from the existing literature and provided an insight and partial explanatory rationale of the reasons people seek professional help for MA. In designing and carrying out the current study aiming to identify further constructs and theoretical explanations of people's decision-making, it was evident there was going to be some implicit influence of CSM on the interpretation and analysis of the data. Thus, it was important to maintain a reflective stance towards the whole process of data collection, analysis and interpretation. Charmaz (2006) made a number of suggestions in addressing this issue which were referred to during the analysis process. For example, one way was by getting familiar and immersing myself in the interview transcripts and initial coding focusing on participants' interpretations rather personal views which helped in reducing preconceived bias being forced onto the data. As data analysis continued, each code was defined based on what was happening in the data, for example by making comparisons what people said and did at each instance considering their background and demographics. This process was repeated throughout the analysis from the initial stages to the end by constantly asking whose viewpoint the codes reflected, which codes the categories subsequently reflected and where the abstract ideas and constructs originated. For example, some of the questions being asked were: Is there a clear and evident connection between the data and codes?; How does the coding reflect the described experience?; Can the data be adequately interpreted without the pre-existing concepts and what extra do they add in the interpretation and analysis?

6.3 Results

6.3.1 Participants

The participants were 21 adults (15 females and 6 males), age between 18-62 years and they all completed secondary education. Twelve participants were studying for a

university degree at the time of the study (part-time or full-time). There were three participants with chronic illness (asthma) and three susceptible to allergies. They were all unwell at the time of the interview or recovering from their symptoms; the majority (n=13) had not seen their GP for their current symptoms.

6.3.2 Overview of the findings

The analysis suggested five factors, embedded in a cyclical process, that influence people's decision whether to seek professional help or not for their cold symptoms: the repertoire of past illness experiences, existing beliefs on how to manage the symptoms, being unwell, assessment of course of action, and external influences. These factors are illustrated in Figure 3. The following sections describe the overall process and each factor in turn, drawing on evidence from the interview transcripts and relating it to similar findings in the literature.

6.3.2.1 Repertoire of past illness experiences

In their stories, participants talked about times when, being unwell with cold and flu symptoms, they decided to seek professional help and about other instances where they did not consider consulting. Thus participants were able to compare their experiences across time and through this process, as cold symptoms start to become predictable and develop a pattern, they begin to know what to expect and what follows on.

Ric (49 years old): for me, um...a cold tends to follow a classic pattern. I get a sore throat for somewhere between 12 and 24 hours, er it tends to go into my nasal passages, er, initially just with some sneezing and dryness, er, then it'll start to run for a day or two and then it just goes very, very thick and if I'm unlucky and it then moves into my sinuses.

Through their accumulated experience of such symptoms and subsequent observation and monitoring of their illness, individuals start to build up a repertoire or a collection of their illness experiences. As cold symptoms could be due to many underlying causes, their experiences help those individuals with chronic or seasonal conditions such as asthma and allergies, to distinguish whether being unwell could be due to those or due to common cold.

Laura (19 years old): I know it sounds a bit strange but...I can usually tell the difference between...when I've got a cold and when it's...just an allergy...uh...in the summer...for example...I tend to be ... it tends to be quite...dry and not...non-productive if that makes sense...

As people get older, their repertoires become richer and serve as the main source for understanding and coping with any new cold symptoms they may have. This is line with arguments suggested by theoretical explanations of everyday memory and cognition where the use of past experience to deal with new experience is a fundamental feature of the way the human mind works (Cohen 1993). In their stories, like Ric below, older participants had no new or unusual symptoms and appeared confident describing their pattern and how to cope with them i.e. becoming experts of their own body.

For Susan, on the other hand, there was more uncertainty when faced with new symptoms she never had or when they exceeded their expected duration.

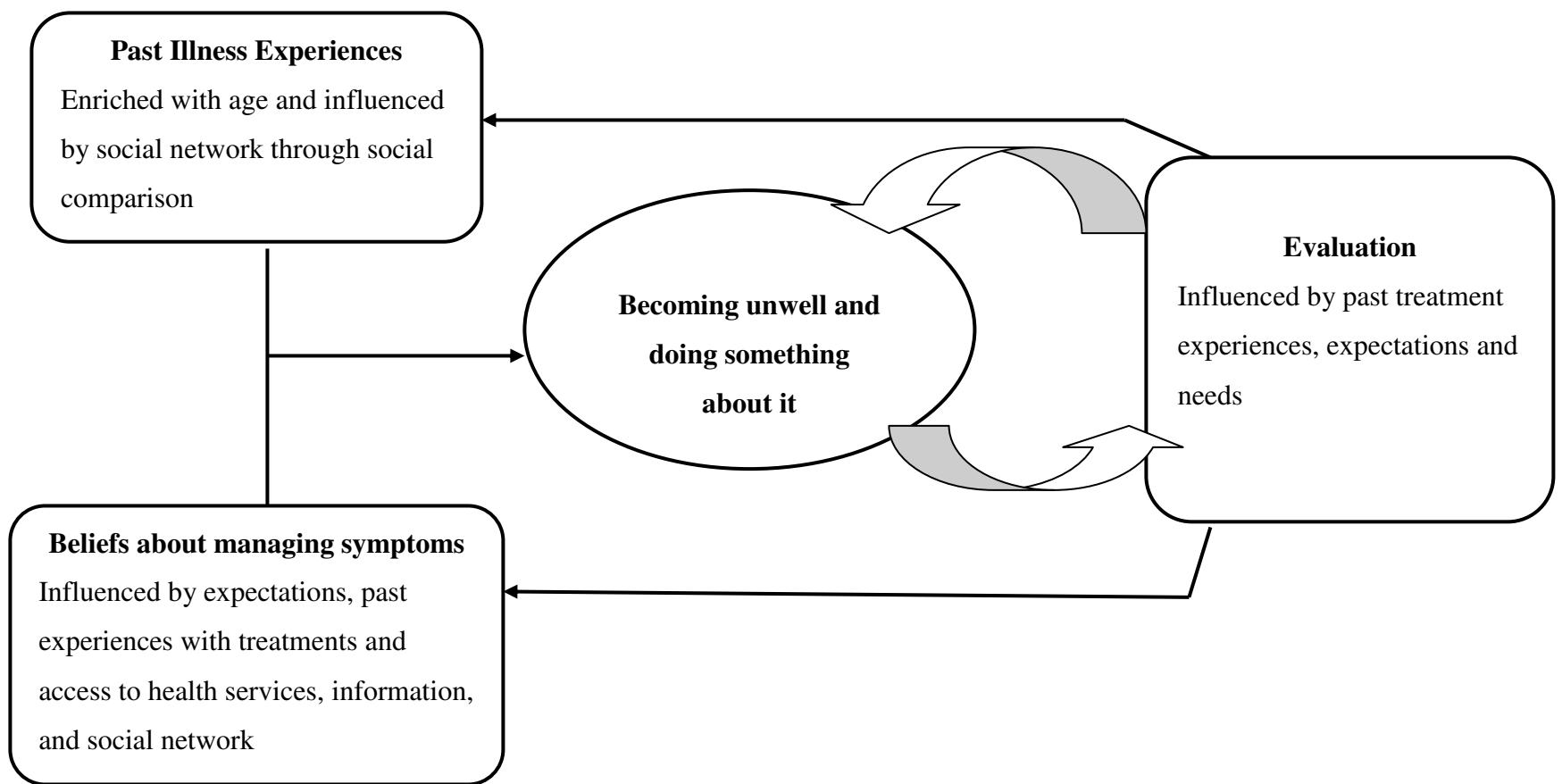


Figure 3 Processes underlying consultations for cold and flu symptoms

Ric (49 years): only probably for somebody like me, at my age, having had as many colds as I have, that have followed the same pattern, probably generally speaking I would do as I do now and, and just ... self administer things

Susan (19 years): it was kind of cold symptoms so...um... kind of bunged feeling, runny nose that kind of thing [...] but also abdominal pain which I thought it was really strange [...], I didn't expect to last...for the five days after I've seen my GP so...that was quite a long time for me, because since I had colds they only lasted a couple of days where ... this one was a week which was actually quite a long time for me...so I was beginning to think you know...am I...is it ever gonna go away.

Lay knowledge about illness and health action is developed over time and 'stored' up for use when needed. Thus once people start to feel unwell, they draw from their 'stored' experiences to interpret the new situation and decide what to do next (Rogers and Nicolaas 1998; Rogers *et al.*, 1999). Such repertoires are not just enriched from lived experiences but also from external sources such as comparison to people around them. This social comparison process helps people define their symptoms and put them in context in relation to others similar to them. Younger people, particularly university students, referred to other fellow students when describing their experiences and interpreting their symptoms.

Martha (18 years old): I think this is fresher's' flu, passing around the whole flat. Uh...I got it couple of weeks ago...I haven't got the fever or anything, it sort of dies down and the cough isn't too bad and ... a bit of a running nose

Comparison with others is considered as instrumental in coping with uncertainty arising from health situations (VanderZee *et al.*, 1995) as it allows people to understand and explain their personal circumstances by putting them into context against experiences of people they feel they share certain characteristics with, in this case with individuals from the same environment.

6.3.2.2 Beliefs about managing symptoms

The experiences people have with cold symptoms accumulate over time and inevitably include ways how to address them. Subsequently, beliefs how to control cold symptoms

develop, become more established and influence individuals' decision-making whether to seek professional help or not. Their beliefs were related to over-the-counter (OTC) medication, antibiotics, and prevention by leading a healthy lifestyle that could protect the individual from getting ill.

People were very cautious and sceptic about the effectiveness of over-the-counter (OTC) medication. The range and the accessibility of such remedies make them a popular point of help when symptoms start to develop and that includes remedies that they have used in the past or suggested by their immediate social circle. Almost everybody had mentioned one OTC remedy they used during their latest illness episode, yet they reflected on the limited positive impact such remedies had on their symptoms. Their expectations of a 'quick fix', soothing the sore throat pain or reducing their cough were not met.

Laura (19 years old): it wasn't...um...it wasn't that effective...it was...soothing, I suppose you could say...but it wasn't...it didn't stop me coughing...coughing...like waking up in the night coughing

Martha (18 years old): I've tried all sorts... and...uhhh none of them really worked at all, the cough syrups even apparently after drinking straight away you may feel a little bit better, I can feel they can cool my throat but ... give it 30 seconds and I cough again, it's not even for an hour so I definitely don't think it works.

The belief that OTC can shorten or provide relieve for symptoms echoes the findings from Johnson and Helman (2004) who examined lay beliefs about remedies for coughs and colds and found that such misperceptions were linked to demand for primary care consultations. Despite the shared feeling of the short-term effectiveness and the quick return of the symptoms, participants continued using OTC usually by trying different brands. There was little suggestion in their accounts in considering the possibility that the body can heal itself but at the same time the availability and strong marketing of such remedies make it rather difficult for people to consider alternative options. Lay beliefs for managing illness are influenced by what Pellegrino (1976) described as 'chemical coping', where the use of drugs and other remedies goes beyond their immediate pharmacological purpose and links to the need of people to be actively doing or taking something (Checkland 2002) for their symptoms. A few exceptions such as Carol, felt that there was no reason in taking them.

Carol (61 years old): Well I know you can get, um, sort of Lemsip and Beechams Powders to dissolve and drink but I try to avoid taking, um, tablets really and, um, I don't really think any of it does any good. I just think ... you, you know, your body has to fight it really.

There was an overwhelming negative attitude towards taking antibiotics for cold symptoms as it was felt they were not helping with the recovery and were harmful to the body. Thus people preferred taking OTC remedies as an alternative, despite their comments about their ineffectiveness, or trying complementary and alternative medicine (CAM). The latter route was mostly used among people who had been suffering from chronic conditions such as asthma and allergies and their disappointment with conventional medicine led them to seek help from other sources.

Jane (60 years old): I almost lived off antibiotics at one time, as soon as I got a cold the doctor insisted I went on an antibiotic because it was, I got so poorly. I try to avoid them if I possibly can. [...] so I try not to go the doctor [...] I go to alternative medication if I can and I take these, they're a sort of a herbal medication, they're like an antibiotic but they're not, they're herbal. So they help with any ailments, um, if I have any kind of infection anywhere, then I just reach for that bottle, basically, and it really helps. [...] So that was helpful [...] kind of helps me get over a cold a whole lot quicker. If I have got one, it makes it, it means it doesn't actually take hold and it doesn't become a problem with an infection.

Despite the general negative attitude towards antibiotics of harming the body, some participants shared a belief that antibiotics, taken promptly, could reduce the impact of symptoms and speed up recovery. Gerry, a young mother, did not like taking medication very frequently but in the particular instance she felt it was necessary to seek professional help to get a prescription to stop spreading the infection to her baby.

Gerry (30 years old): I waited for one day actually and then I started to take it because I saw that I was not better and uh...and I needed the antibiotics so that the baby [would] not to be in danger

People do not just take OTC or CAM remedies once they have cold and flu symptoms. Participants expressed their belief in preventive measures as well, as a way to avoid getting ill and having a positive impact on life in general. This links to the shared feeling that OTC medication is not very effective and antibiotics are not helpful thus people strive to find other ways to be in control of their symptoms and reduce the impact of the infection. The use of supplements and a more general life change such as a healthy diet provides people with a strong sense of being in control of their lifestyle and dealing with their health when they are unwell. This is more evident among people suffering from allergies and asthma, and have been using CAM. Sue had asthma and she was let down by the lack of communication and support from her GP thus she started using aromatherapy and various herbal supplements to control her asthma symptoms. These were then introduced as part of everyday use including dealing with cold symptoms.

Sue (46 years old): I think it's to help to achieve optimum health and prevention measurement for you know... contracting infections but I don't believe you can avoid getting a cold under any circumstances but I do believe you can...you can lessen the symptoms and uh...limit the amount of time that you have getting on you; [...] in the past I used Echinacea mixtures as well, some times I use that uh...um...as preventive measure as well, like vitamins, not just when I have symptoms or I'm not feeling so good but everyday...

6.3.2.3 Being unwell and doing something about it

Once people become unwell they try to understand and interpret their symptoms. Drawing from their past experiences, they compare their current situation with similar symptoms they had in the past and try to seek a label that will enable them to engage in a decision-making process on what to do next. The latter is also influenced by their beliefs on what works or not based for their symptoms. This process maps to the illness perceptions described by the Common Sense Model (Leventhal *et al.*, 2003) where people, once they are unwell, they go through a number of steps e.g. make sense of what they have, in order to achieve cognitive coherence which in turn affects their subsequent decisions on what to do.

If symptoms match with what they had experienced in the past they follow an established management pathway. The actions participants decided to engage in appear to be

sequential: a wait and see and await resolution, self-care of home remedies, use of OTC or CAM, and some seeking professional help. Participants allowed time for the body to recover, acknowledging that symptoms need time to subside but the time length varied e.g. Martha decided to see a doctor after her fever was not going down after two days despite taking paracetamol or Tania having a continuous ear-ache for more than three days. Thus in this instance two factors appeared as the main influence on decisions to seek professional help: a) the duration of symptoms, and b) their subsequent impact on everyday activities. Jack went to see his doctor because his cough was taking too long to ease off and after his colleagues suggested he had to do something about it.

Jack (38 years old): and I start thinking about it and people start commenting coz it gets irritating, always coughing um [...] most people recognise a cold for a cold, don't they? and then just don't worry about it too much...um...yeah...it's when symptoms are slightly unusual...I mean in my experience, it means it lasted longer than it supposed to have done um...

People try self-care before considering seeing a doctor. Chambers et al. (2006) argues that they may abandon this effort too soon believing that their symptoms are persisting, not necessarily because the remedy they were using was no longer relieving the symptoms, but because they were unsure whether their symptoms were due to something more serious. Jack had little expectations about the effectiveness in seeing the doctor for a cough as there was nothing that could be done about it; only when the symptoms exceeded their expected duration, in this case at least two weeks, seeking professional help was considered as the next step to ensure there was nothing else going on.

Related to the previous theme on beliefs on managing symptoms, seeking professional help was also related to the belief that antibiotics could reduce the severity of symptoms and prevent them from exacerbating.

Nicki (18 years old): I would see that my nose is infected really, they should give me antibiotics or something close to antibiotics to actually combat that...but here not, she didn't give me anything

Similarly, Gerry wanted antibiotics for her cold, despite not being keen on taking them, because she wanted to speed up her recovery and prevent the symptoms from getting

worse. In her case, she did not want to pass her infection to her newborn baby. Chambers et al. (2006) argued that health care professionals need to provide the necessary information about the value of awaiting the resolution and tolerance of symptoms as remedies and antibiotics cannot cure cold. However, in cases like Gerry's, it may be equally important to address issues of concern of the possible implications of the impact of the infection on other dependents and the interference to the social role of looking after the family (Cornford 1998).

6.3.2.4 Evaluating the course of action

The appraisal process of the different actions people do to address their symptoms is evident throughout the themes discussed above where individuals constantly compare and monitor the progress of their symptoms. This process is influenced by the pre-existing treatment beliefs people hold and the expectations of the impact such treatments could have on their current situation. Thus there is a loop interconnecting past illness experiences, beliefs and expectations about the treatments, actual experience and appraisal. A central characteristic of the appraisal process is the readiness of the individuals to consider alternative actions when something they are trying is not as effective as they expected. The availability and access to a wide range of options on what people could do about their colds suggests that individuals may engage in such process continuously until they find something that is working for them.

Ric (49 years old): Um ... if, if I was getting to the point where I thought this is, ohh, this is lasting longer than I would like but I'm not at the point where I wanted to go and see the doctor, then I would probably find it very useful [to check something else] and, kind of, once you get beyond this point, you think, yeah, I'd better go and see the doctor.

Seeing the doctor yields both positive and negative reaction towards the outcome of the consultation. People deciding to seek help when they had unfamiliar symptoms felt reassured and content when they were told these were cold-related regardless if they got a prescription at the end.

Ray (52 years old): but ummm...after seeing the doctor I tried not to think about it too much because I wasn't as worried [...] so I didn't really worried about that at

all, after I saw the doctor, whereas before, because the duration I was getting more and more worried that it could be something...

On the other hand, when people were getting a prescription in the past it created the expectation that the particular remedy was necessary for the particular symptoms. Thus, when experiencing the same or similar symptoms again the decision to seek professional help was based on what they did in the past. Ashworth et al. (2004) argued that prescribing for acute self-limiting conditions, such as colds, medicalises the symptoms and creates the expectation that a prescribed remedy is necessary. However, when individuals are told that a prescription is not necessary with little else explanation, it creates conflict and puzzlement about the reasoning behind the current decision and previous experiences.

Carol (61 years old): I used to suffer with tonsillitis when I was a child so [...] then I would consult the doctor in the hope of getting penicillin cause penicillin used to do wonders for me as a child [...] I did go to the doctor a few years ago, I think 5 years I was at work, with a sore throat and, um, asked if I could get [...] penicillin and he said no, 'you just have to... , he just said, you know, get over it, sort of thing.

I: And what did you think of that?

Carol: Well I was a bit upset at the time, yeah, particularly as I thought that penicillin would get rid of it quickly, you know.

Inconsistent advice and management from the health care professionals cause confusion and uncertainty among the patients (Chambers *et al.*, 2006).

6.3.2.5 External influences

Lived experiences do not take place in isolation. Decisions on what to do are embedded in a social context and social interaction with others (Chapple and Rogers 1999). Throughout people's illness experiences and subsequent actions, individuals draw information and advice from a number of external sources that influence understanding of their conditions and subsequent decisions. Therefore, this factor is not represented as a separate component in the graphical representation of the other factors (figure 3) but rather is included as part of them. There is a dynamic relationship between illness experiences and external sources

of help, where the contribution and the influence of the latter in seeking professional help may vary depending on factors such as availability and accessibility.

A prominent source of help and advice for the participants was the family and the social circle in providing advice in interpreting the symptoms and deciding what to do, a consistent finding in the literature for a range of conditions in primary care (Scambler *et al.*, 1981). As discussed earlier in chapter 2, families and close social networks is the most immediate source that can be easily accessed thus participants often quoted these as influencing their decisions e.g. Jack, mentioned earlier on, went to see his doctor after his colleagues commented on his prolonged coughing and Angela being advised by her parents to wait for a few days before seeing the doctor for her sinusitis. The disappointment with conventional medicine in listening to Jane's concerns has been critical in seeking help elsewhere and through friends she was introduced to herbal medication. The contribution of CAM and the social network is not valued only for having positive impact on her health problem but it is also welcomed for the wider qualities of communication of being listened to and supported when she needs to.

Jane (60 years old): It was really bothering me but I don't get any advice about colds from my doctor.

Talking about her friend:

she kind of, um, has introduced me to some of the, um, things that are good for different things, you know, herbal ones so that's really helpful, so I would take advice from her, really, more than ... She's a neighbor so she just lives up the road so it's very easy, I just pick up the phone and say, hey, this is happening, what do you think I can use that's going to help. So it's not just for cold. So I would go that route if I can, anyway.

Another factor that seems to influence beliefs about the type of treatment needed for colds and subsequent action is the structure of, and accessibility to, the health system. Judy, an international student, had different experiences using the health services in her home country and the NHS, causing puzzlement and frustration.

Judy (19 years old): In [name of the home country] pretty much when you get sick you go immediately to see a doctor, you are going to see a doctor and you are expecting to be up and running totally clear off by the end...by one week or so.

The expectation of immediate access to the doctor and medication to resume normal activities, thus medicalising symptoms (Ashworth *et al.*, 2005), contrasts her experience when seeing a nurse at a local NHS GP surgery where she was told to have more rest and increase her fluid uptake.

I'm having cold then she asked me for my symptoms and things like that and I was saying her can I see a doctor and she said... "no, no, no you don't need to see a doctor", she sent me back like this [...] I didn't think that her advice was very useful...in a sense that if you give me this advice why should I come to see you?

An emerging influential source of health information frequently quoted by many young participants was the use of internet to search for various symptoms (not all cold or flu related). The growing significance of internet providing detailed knowledge about health and disease across health care settings has been repeatedly highlighted (Budtz and Witt 2002; Chambers *et al.*, 2006; Trotter and Morgan 2008) as a powerful reference source. Most of the participants, particularly the younger, used internet as one of their sources for health information in general however, it was not particularly helpful for their cold-related symptoms.

Ray (52 years old): normally I think there aren't... [sites] where you can work through what your symptoms are and normally is a lot of like online forums have web. [...] so you can't just read something on one site and then try out because a lot of times are just uhh...people who you don't know and uhhh they have no expertise, there are not an expert...or professionals in that field at all so you have to go on to quite a few different sites just to make sure that if it is on quite a few sites then I may possibly try it just to make sure that...ummm I can trust that information...

Similarly Susan found the information unhelpful and too general for her symptoms.

Susan (19 years old): but sometimes if I got health problems then I go online and look it up [...] sometimes, wikipedia, if I'm looking for like....for cold and cold symptoms and then read about it and read about treatments and stuff like that, or just a general research on google and then just see what comes up [...] some of them is useful...but a lot of the stuff.... just kind of went into details that wasn't necessary, I wasn't related to ... what my symptoms are... so they've got like general information [...]

This creates a paradox where the participants did not feel they could make use of the expanding library of online health information (Anthony 1996) as it did not meet their specific symptoms and concerns.

On the other hand, the majority of older participants did not refer making use of this medium at all which may suggest that internet may not be available, easily accessible or user friendly to everyone. Indeed evidence shows that there is less access and use of internet-based information among older people although the gap is decreasing (Zickuhr and Madden 2012) and there is evidence for a growing interest for online health and medical information (Crabb *et al.*, 2012; Macfarlane *et al.*, 2012). Another explanation could be that older participants saw no need to look for further information for their symptoms as they felt confident in identifying their symptoms as cold-related and knew what they could do to address them effectively. This could be due to their richer illness repertoires developed over time, as discussed in the theme earlier on repertoire of past illness experiences. Their main referral point was the context of their lived experiences which addressed arising questions and concerns related to their current symptoms thus they felt no need to seek for other resources.

6.4 Conclusion

6.4.1 Summary

This chapter has focused on people's stories of being unwell with cold and flu symptoms and how they dealt with them. The conceptualisation of the data was grounded in people's experiences over time and allowed to look for emerging patterns both within the stories of the same individual and the experiences of the group as a whole. The processes underlying

the decision on what to do e.g. consult or not are embedded within a cyclical pattern where past illness experiences, beliefs about managing symptoms and external factors, such as the wider social context and access to services, set the framework how people interpret the current state of their health condition and subsequent decision on what to do. Evaluating the actions they take to address their symptoms completes this cycle where re-assessment feeds back into the treatment decisions, and enrich further the repertoire of illness experiences and beliefs about symptom management.

Participants portrayed an expertise in terms of what they needed to do when they first felt unwell, and had pre-set ideas regarding the development and the duration of their symptoms. In most cases the decision to seek professional help was not their first option for action; their accounts indicated an effort first to self-care, including a wait-and-see approach or use home remedies when they felt their symptoms were not severe or had little expectations that their GP could offer additional help.

However, there were instances where there was uncertainty of whether they had something more serious thus there was increased need for reassurance and guidance on what to do. Their uncertainty was related to: the duration of symptoms exceeding their expectations and possibly an indicator of the seriousness of the illness; the impact of being unwell adversely affecting their everyday activities; and the belief that an antibiotic prescription was necessary based on previous instances where a prescription was given for similar symptoms.

6.4.2 Theoretical constructs linked to the decision to seek professional help

Links of the arising concepts with theoretical models

The overall process to consult, as depicted in figure 3, maps onto the theoretical model of the Common Sense Model (Leventhal *et al.*, 2003) which has been tentatively suggested by the existing literature discussed in chapter 2. The findings provide further evidence about the evaluation of treatment outcomes with reference to treatment expectations and past illness experiences. This study has also highlighted the importance of past illness repertoires in providing the context to understand and interpret current symptoms and subsequently deciding on the course of action.

The examination of the past illness experiences has also lead in identifying differences between individuals where some people appeared to be more confident in the interpretation

of their symptoms and subsequently how to deal with them. The confidence in self-diagnosis was also coupled with certainty that their treatment decision would have a positive impact on the symptoms, e.g. use of CAM. This process maps onto the constructs of self-efficacy and outcome expectations proposed by the Social Cognitive Theory (Bandura 1986) discussed in chapter 2. The age of the participants emerged as a moderating factor that could partly explain why some people expressed more confidence in their self-management than others and less willingness to seek professional help. As people get older, their repertoire of illness experiences is enriched thus providing them with a greater sense of self-belief in being able to recognise and treat their cold and flu symptoms compared to younger people. An interesting question arising from the age differentiation was whether such differences could be influenced by the social network in both symptom interpretation and suggestions on what to do next. Thus younger people with strong social network may feel confident and certain when to consult and what to do if they have new symptoms. Data from the one participant satisfying the set criteria showed no different patterns to the overall findings. But it was not possible to deduce whether the particular group of young university students were more likely to consider seeking professional help because they were away from the parental home, possibly for the first time, or whether their behaviour reflected a common cognitive and behavioural pattern of all young people of that age.

A third theoretical dimension arising from the analysis concerned the beliefs about medication both prescribed and non-prescribed. Individuals felt that the overuse of medication in general can have adverse effects and some participants felt that antibiotics in particular were harmful especially those deciding not to seek professional help for their symptoms. The concepts of overuse and harmful medication are related to the model Beliefs about Medication (Horne *et al.*, 1999) where individuals, through their exposure of illness and social environment, establish their views related to medication taking. Participants also raised other issues more specific to cold and flu symptoms that are not mapped to any theoretical model. These include beliefs about the effectiveness of specific types of medication, such as home remedies, supplements or over-the-counter medication that could control symptoms or in some cases cure them.

The next chapter presents the survey study of the thesis that focuses on the theoretical underpinnings of the intervention by investigating the most important variables related to seeking professional help for ARTI.

Chapter 7 Identifying the most significant predictors of consultation for cold and flu symptoms

7.1 Aims of this chapter

This chapter presents the last empirical study of the thesis. In order to further the development of the web intervention, this study aimed to advance the understanding of the underlying theoretical specifications of the intervention by identifying the most significant factors associated with consultation behaviour for respiratory tract infections (RTI) including cold and flu symptoms.

The factors included in the study were drawn from two main literature areas. The first was based on the review of the existing literature on RTI (chapter 2) and the findings from the qualitative study about the experiences of having cold and flu symptoms (chapter 6). Tentative evidence from the literature review suggested the role of the Common Sense Model (CSM; Leventhal *et al.*, 1980) and the Social Cognitive Theory (SCT; Bandura 1977) in explaining self-care and consultation behaviour for acute respiratory infections. The support for the two models was reinforced by the findings of the aforementioned qualitative study which provided evidence of the role of beliefs about managing symptoms in influencing decision-making on whether to seek professional help or not. These factors have not been quantitatively assessed on whether they are associated with consultation behaviour for RTI.

The second body of literature area was based on the substantial body of work looking at factors associated with consultations in primary care, both for general conditions (e.g. Little *et al.*, 2001b; Vedsted *et al.*, 2004; Kapur *et al.*, 2004a; Vedsted and Christensen 2005) as well as for more specific symptoms i.e. factors related to minor ailments and RTI (e.g. van Duijn *et al.*, 2007; Cals *et al.*, 2009; Banks 2010). Evidence shows a wide range of variables associated with consultation e.g. health anxiety, chronic physical and psychiatric illness, perceptions about treatment, psychological distress, tendency to report somatic symptoms, older age, and being unwell for more than two weeks. However, the emerging patterns appear to be quite unclear as many of these factors are complex and interact with each other (Gill and Sharpe 1999; van Duijn *et al.*, 2007) with implications when designing interventions (Smits *et al.*, 2008). In addition, some of the variables associated with consultation such as perceptions of being unwell and attitudes towards

treatment are not clear how they were developed and their underlying theoretical premises. Therefore, the current study takes the existing evidence a step further and investigates whether the factors identified in earlier work associated with consultation in primary care together with the psychosocial factors that have emerged from the literature review and the qualitative study about the experiences of having cold and flu symptoms can provide further explanatory power in predicting consultation for RTI. The findings will help to enhance the theoretical modelling of the web intervention by identifying the theoretical constructs that are more closely related to consultation behaviour and subsequently the related factors that can be included in the development of the intervention.

7.2 Method

7.2.1 Sampling and Recruitment

This was a cross-sectional questionnaire study and the study protocol was approved by the Ethics Committee, School of Psychology at the University of Southampton.

The study aimed to recruit adults over the age of 16 who were willing and able to give informed consent. It was based on convenience sampling from the general adult population. Self-selected participants completed a number of questionnaires (Appendix 14) which were available both online and in print. The internet provides an efficient and economical medium to recruit a potentially large sample in a limited period of time (Birnbaum 2000; Blair and Czaja 2005). It also provides the advantage to recruit individuals from wider geographical areas compared to paper-based methods. Participants can access the study when it is convenient for them and can take part if they are motivated rather than out of obligation (Reips 2000).

Participation to the study was anonymous unless the participants opted to give their contact details to claim the available thank you token. Seven entries were found to be duplicate, thus only their first entry was included in the analysis.

The recruitment mainly started through the internet and the online questionnaire link was advertised (Appendix 13) and distributed through the University of Southampton email distribution lists, and group email lists both academic and non-academic related. In

addition, it was advertised through personal contacts, professional bodies and general interest websites.

Purposive sampling was later used aiming to recruit more middle-age and older people as well as individuals that were not necessarily reached by the online recruitment method. This was done through recruitment in the wider community with advertisements posted in community centres of the Southampton area; prospective participants were approached through various public centres such as libraries, job centres, church halls holding meetings for e.g. young mothers and babies groups, older adult and pensioner exercise groups, and social network groups such as the Women's Institute. The researcher had envelopes with the printed questionnaires that participants could fill and return later. The recruitment took place from end of November 2008 until mid-February 2009.

Sample size

Based on previous studies (Duijn *et al.*, 2007) in order to detect risk factors with an odds ratio of 2 for consultation, a sample size of 300 was required to give 90% power and two-tailed $\alpha=0.05$ (or 500 participants allowing for 40% non-response). The sample size was calculated using the G*Power 3.1.3 software.

7.2.2 Procedure

The study was hosted by the Department of Psychology at the University of Southampton. The undergraduate psychology students of the university were able to claim 3 credits for their time by giving their student identity number. Alternatively, a £5 voucher was sent to those not opting, or not eligible, for the credits by completing their name and postal address at the end of the questionnaires.

The first page the participants viewed on the online study contained information about the project followed by the consent form (Appendix 15). The participants had the option to accept by clicking a radio button at the end of the page and only then they were able to continue with the questionnaires. At the end of the questionnaires, they were asked if they wanted to give their student identity card details for the 3 credits or their contact details for the thank you voucher. The last page presented was the debriefing statement (Appendix 18). For the study in the print form, the prospective participants were given an envelope with the questionnaires and debriefing statements as in the online version. They also received a more extensive version of the information sheet (Appendix 17) due to less space

restrictions compared to the web version. The letter of consent (Appendix 16) informed participants that the completion and return of the questionnaire was taken as evidence of their informed consent thus they did not have to sign and return any other additional form. At the end of the questionnaires there was a reply slip where participants could opt to give their contact details for the £5 voucher and return it with the questionnaires in the enclosed pre-paid envelope.

Responses from the online questionnaires were automatically stored in a text file on the website. Data retrieval was protected by username and password access. The paper-based questionnaires were filed and archived according to the regulations of the Ethics Committee. All the data were entered into SPSS for Windows (version 19) for analysis.

7.2.3 Questionnaires

The study focused on a specific past event: the participants were asked to focus on a past event where they experienced one or more RTI symptoms for which they considered to seek professional help (regardless if they actually consulted). The selection of this time framework, instead of investigating the frequency of attendance (FA) for these symptoms over a period of time as most of the existing literature on primary care consultations, was done for two reasons: firstly, recalling of a single consultation was similar to the design of the qualitative study on people's experiences with cold and flu symptoms (chapter 6) where participants were asked to recall a particular event for which they considered to seek professional help. In this way, the findings from the qualitative study were used to inform and select possible predictive factors for this study. Secondly, many studies that examine general FA in primary care ask participants to recall the number of times they consulted over a period of time, usually for the previous 12 months (e.g. Vedsted *et al.*, 2004; Vedsted and Christensen 2005; Ferrari *et al.*, 2008). However, the self-report recall period for RTI would need to be longer as many people do not consider seeing a GP for their symptoms every year and could introduce recall bias on the actual consultation rates.

As mentioned earlier, this study included measures assessing factors drawn from previous studies that looked at consultation in primary care e.g. (Little *et al.*, 2001b; Kapur *et al.*, 2004b) and were found to be significant predictors of consultation. In addition, such factors were supplemented by measures addressing theoretical factors or constructs linked to consultation behaviour due to cold and flu symptoms. Some measures were developed

specifically for the needs of the study as there were no established or known tools that could assess certain constructs.

The outcome variable was a dichotomous question on whether people consulted or not for the particular event they recalled having one or more RTI symptoms.

The following sections present the measurement instruments used in the study, both from previous work as well as the new ones developed for this study. All measurements are summarised in Table 13 and presented in full text in Appendix 14.

7.2.3.1 Existing measurement instruments

Socio-demographic and lifestyle questions

Individual items measured socio-demographic characteristics that have been associated with consultation behaviour: age, gender, highest educational or vocational qualifications, employment status, ethnicity, and current living location (e.g. university halls, living independently, living with parents). In addition, a question on alcohol consumption (units per week) and smoking status (never smoked, ex-smoker, current smoker) was also included as they were also found to be related to consultation behaviour (Little *et al.*, 2001b).

Illness Perception Questionnaire revised (IPQ-R):

This is a well-validated and reliable questionnaire (Moss-Morris *et al.*, 2002) measuring nine dimensions of perception of illness and is widely used in explaining and predicting behaviour. The development of the questionnaire is based on the Common Sense Model (Leventhal *et al.*, 1980), discussed earlier in chapter 2, which has also provided an explanatory framework for the qualitative findings in chapter 6. The model, in short, depicts that people's understanding of their symptoms, both at cognitive and emotional level, can influence their subsequent actions in dealing with these symptoms. Evidence from the Gill and Sharpe (1999) review on frequent consultation in general practice has also showed the importance of assessing patients' beliefs and perceptions about specific symptoms. These were found to be more important in determining whether people consulted or not rather the frequency of symptoms or their severity.

The IPQ-R was reworded for this study by replacing the word 'illness' with 'symptoms' where appropriate to make the statements more relevant to the study context. In addition, the instructions were changed from being general, i.e. 'indicate level of agreement with the following statements about your illness', to more specific, i.e. 'indicate level of agreement with the following statements referring to the symptoms you considered to see a doctor', in order to align all the measurements with the outcome of a specific event occurring. The questionnaire consists of the following sub-scales, one for each of its nine dimensions: *Timeline acute-chronic* (6 items) measures beliefs about the timeline of symptoms in terms of the degree to which they are chronic, for example 'my symptoms last for a long time'. *Timeline cyclical* (4 items) measures belief in the cyclical nature of the health problem, for example 'my symptoms change a great deal from day to day'. *Consequences* (6 items) measure beliefs in personal control over the symptoms, for example 'my symptoms have major consequences on my life'. *Personal control* (6 items) assesses the degree of personal control over the health problem, for example 'The course of my symptoms depends on me'. *Treatment control* (6 items) measures beliefs in the ability of treatment (suggesting provision from a third party) to control the symptoms or the health problem, for example 'My treatment can control my symptoms'. *Illness coherence* (5 items) refers to the coherence of understanding of the health problem, for example 'The symptoms of my condition are puzzling to me'. *Emotional representations* (6 items) assess the emotional impact symptoms have on the individual, for example 'Having these symptoms make me feel anxious'. All items were scored on a five-point Likert-type response scale, ranging from 1 (strongly disagree) through 5 (strongly agree) where higher scores suggested stronger beliefs for the concept each sub-scale represented apart from Illness Coherence where high scores indicated little understanding of the symptoms. There were two further subs-scales in the IPQ-R, namely *Causes*, assessing causal beliefs of the health problem, and *Identity* which consists a number of symptoms associated with one's health problem where the participant is asked to indicate whether they are related to his/her illness. Both scales were omitted from this study as there was no evidence from the literature and the qualitative study (chapter 6) these dimensions to be related or involved with RTI consultation behaviour.

Medical Problems

A checklist of 26 chronic medical problems was used, as used by Little et al. (2001), supplemented by two further health problems (Lung disease and Compulsive Obstructive Pulmonary disease). Participants had to indicate (Yes or No) whether they were told by

their doctor if they had any of the specified problems by ticking the corresponding box. This self-report has been previously shown to be valid compared with patient notes (Westhead 1985; Karlsson *et al.*, 1995).

Health Anxiety

This has been assessed using the Whitely Index (WI; Pilowsky 1967), a binary (Yes or No) self-report questionnaire comprising 14 questions all negatively worded apart from one item (score range 0-14). The total score is the sum of all the positively answered items and low scores suggest low anxiety. The scale has been used both in general practice and general population samples (Speckens *et al.*, 1996; Little *et al.*, 2001b) to differentiate people suffering from health anxiety from those who have actual physical illness but are not excessively concerned about their health.

Health Status

Health-related functional status, general health, and quality of life were assessed with a questionnaire based on the COOP/WONCA Functional assessment charts (Nelson *et al.*, 1987). This is a generic questionnaire used in primary care (e.g. Bentsen *et al.*, 1999) with good validity and reliability (van Weel *et al.*, 1995; Lindegaard *et al.*, 1999). Each of its nine questions is accompanied by a chart illustrating the particular dimension of health status being addressed (Wilkin *et al.*, 1992). For this study however the charts have been omitted due to difficulty in uploading the pictures online, but the wording of the questions remained unchanged. Previous work (Larson *et al.*, 1992) has shown that there were no response differences between individuals receiving the chart illustrations and those who did not. The nine questions were developed as independent items, rather forming a scale, measured on a 5-point Likert scale (1-5) with higher scores indicating lower health status. Nonetheless, exploratory factor analysis with varimax rotation was performed to identify if there was any item overlap and if a smaller number of variables could be deduced. No meaningful loading was found thus the items were retained as independent in the subsequent analysis.

Negative Attitudes to Doctors

Attitudes towards doctors and medicines could be involved in explaining behavioural outcomes as previous work has shown, for example in doctor-patient relationship (e.g. Pendleton 1983) and consultation behaviour (Little *et al.*, 2001b). Marteau (1990) developed a measurement based on women for ante-natal care and individuals involved in

health care such as nurses and medical students. It comprises four sub-scales, i.e. positive attitudes towards doctors, negative attitudes towards doctors, positive attitudes towards medicine and, negative attitudes towards medicine. However, very little work has been done since then to investigate the psychometric properties of the scales in other population groups other than in its original development.

Table 13 Questionnaire measurements included in the study

Measurements	Description of the items measured/questionnaires used
Socio-demographic	Age, sex, ethnicity, educational and/or vocational qualifications, housing, employment status - 6 items
Lifestyle	Smoking status, Alcohol consumption - 3 items
Illness perceptions	Illness Perception Questionnaire Revised (IPQ-R) – 38 items
Medical problems	A list of 26 chronic medical problems participants recalled being told by a doctor
Health anxiety	Whitley Index – 14 dichotomous questions
Health Status	Modified COOP WONCA charts-9 items
Attitudes to doctors	Scale assessing negative attitudes to doctors – 6 items
Medically unexplained physical symptoms	Somatic Symptom Inventory – a checklist of 35 symptoms with no given medical explanation
Self-rated health	A single item question to rate current health state
Personality factors	Two questions developed based on personality type description of high consultation attendees.
Beliefs about Medication	Beliefs about Medication Questionnaire (BMQ) – General scale: 8 items measuring harm and overuse medication beliefs
Beliefs about managing symptoms	Scale of 22 items measuring beliefs on managing RTI symptoms such as antibiotics and remedies
Self-efficacy and outcome expectations	Scale of 29 items assessing self-efficacy and outcome expectations based on the Social Cognitive Theory
Last time being unwell	The last time being unwell due to RTI that the individual considered seeking consultation – single item question
Consulting - Outcome	Single item question on whether participants consulted for their particular RTI episode (Yes/No)

Subsequent work by (Conroy *et al.*, 2000; 2002) failed to replicate the factor loadings of the sub-scales and suggested that such attitudes are strongly dependent on whether general stereotypes or particular experiences are assessed. Little *et al.* (2001b) used two of the sub-scales, positive and negative attitudes to doctors, but only the latter was found to significantly predict high consultation attendance. In addition, the positive attitudes to doctors scale did not have face validity to the population and outcome of this study thus it was decided to use only the negative attitudes to doctors subscale; the scale comprises six Likert-type items on a six-point scale where higher scores suggest lower negative attitudes (score range 6-36).

Medical Unexplained Symptoms (MUS)

Participants were presented with a somatic symptom inventory checklist of 35 symptoms where they indicated (Yes or No) if they suffered each of the symptoms for which no medical explanation was found and were severe enough to interfere with normal life or which required seeing a doctor. The checklist was derived from the Diagnostic Interview Schedule (DIS) which forms part of the DSM-III-R criteria for somatisation disorder Peveler *et al.* (1997). Somatisation of unexplained symptoms has been considered in several studies investigating predictors of frequent consultation (e.g. Katon *et al.*, 1991; Karlsson *et al.*, 1995; Portegijs *et al.*, 1996) and evidence suggests that those with more somatic symptoms have significantly more psychiatric morbidity, disability, health care use and higher levels of distress (Gill and Sharpe 1999).

Rate your health

This was one item question to rate current health (1-4; very poor, good, poor, very poor) (Robinson and Granfield 1986).

Personality Factors

Two questions based on Kokko's description of personality types related to consultation behaviour (Kokko 1990) were also included in the study. The six-point Likert type questions were 'I often need to re-consult to get the right treatment, and 'I usually try the chemist before going to see the doctor', and were found to be significantly associated with consultation attendance (Little *et al.*, 2001b). Higher scores suggested lower need to re-consult in the first question, and lower use of the chemist before seeing the doctor in the latter question. The word 'chemist' in this instance refers to pharmacy or pharmacist; the

terms are used interchangeably in the subsequent chapter, however the two questions are included in the final questionnaire of the survey as described in Kokko (1990) above.

Beliefs about Medications Questionnaire (BMQ) - General

The BMQ scale is a valid and reliable measurement that comprises two sub-scales: the first, BMQ-General, addresses beliefs about use of medication in general, and the second, BMQ-Specific, addresses beliefs about specific medications related to the target study population (Horne *et al.*, 1999). The authors proposed that the two scales can be used in combination or separately; the questions of the BMQ-Specific were not regarded as relevant for the purposes of this study thus they were not included in the measurements. The BMQ-General scale comprises two 4-item factors: beliefs about the potential harm of medicine (items 16, 18, 19, 21) and beliefs that medications are overprescribed by doctors (items 17, 20, 24, 25). Their inclusion in the study was based on the tentative evidence from the qualitative study on the experiences being unwell (chapter 6) where the participants who felt it was unnecessary to see their GP for their symptoms also expressed strong beliefs about the harm medication, in general, can cause to the body and its overuse and promotion through advertising, media and health care professionals. High scores on the BMQ-General section suggest strong beliefs towards medication overuse and harm; all items were scored on a five-point Likert-type response scale (score range 4-20 for each scale). In this study, the two subscales were significantly related, $r=0.48$, $p=0<0.001$

7.2.3.2 Development of new measurement instruments

Two questionnaires were developed specifically for the needs of the study: the Beliefs about managing symptoms scale, and the Self-efficacy and Outcome expectations scale. There are guidelines that propose a series of steps for the development of measurement instruments, or scales, to ensure psychometrically sound properties and subsequently increase the robustness of the study findings (e.g. DeVellis 2003; Boyton and Greenhalgh 2004; Rattray and Jones 2007; Streiner and Norman 2008). The list below presents and explains the various steps for scale development based on the aforementioned guidelines. This is followed by discussing the development procedure of the two new scales of the study and how closely the steps of the guidelines were adopted.

1) Determine the content of the scale by clarifying the purpose and the underlying concepts being studied. This process is facilitated by a literature review of the related theoretical

aspects, if available, that can guide the conceptualization and the various dimensions of the key constructs in question. In addition, the review will also help to determine the level of specificity of the items i.e. whether to focus on very specific beliefs or behaviours or whether to consider more general and broad measures.

- 2) Generate a pool of items based on the purpose of the scale and capture the main concept in different ways. A selection of these items are then included in the final scale. When drafting the items a number of issues need to be considered e.g. a) difficulty of the reading level at which items are written, b) exceptionally lengthy items may increase complexity and reduce reading comprehension, c) multiple negatives and double barrelled items need to be avoided as well as ambiguous pronoun references, d) inclusion of positively and negatively worded items can reduce agreement bias (the tendency to agree with items regardless of content), e) avoid the use of jargon.
- 3) Determine the scale and format e.g. Likert scale, multiple response, visual analog or binary option. In addition, one may consider various response formats e.g. five-point, seven-point that can include in the pilot stage of the scale. The decision depends on the nature of the variable(s) in question and the intended use of the scale.
- 4) Experts in the field can review the initial item pool. This will help to assess the relevance of items to the construct(s) of interest thus helping to: determine which items to retain, refine wording, evaluate the clarity and conciseness of the items, and suggest possible alternative ways to study the constructs that may not have been included in the instrument up to that point. For the same purpose the items may also be given to a small group of participants from the target population in order to elicit a wider range of feedback. The process of this stage also serves to increase the content or face validity i.e. the extent to which the scale items reflect the proposed construct(s) the instrument intends to measure.
- 5) Inclusion of validated items: although the validity of an instrument is achieved through a cumulative and ongoing process, researchers may start assessing construct validity, the extent to which the attributes of the developing instrument are related to other established constructs as depicted by theory, at the early stages of the scale development. This can be achieved by including some additional measures of relevant and established constructs against which to test the developing instrument. The additional measures can be also be

used to assess other types of validity e.g. convergent validity which refers to the correspondence between constructs that are theoretically similar, and discriminant validity which refers to the new instrument's capability to differentiate between constructs that are theoretically different.

6) Distribution of the questionnaire to a group of participants representing the population for which the instrument is intended to evaluate the individual items. The sample size depends on the ratio of participant to items; small groups do not allow a fair representation of the correlations between the items.

7) Evaluation of the items in terms of their statistical performance. This includes the calculation of the reliability coefficient (Cronbach's alpha) which indicates how well the items of the instrument fit together conceptually, i.e. there is internal consistency, and scores of 0.70 or over suggest satisfactory reliability. Item means and item-total correlations can provide additional information about the potential value of the items.

Factor analysis (principal component analysis) can be used to determine which groups of items cluster together and if they represent a conceptual structure. This statistical process can also evaluate the construct validity of the scale by identifying the various factors that define the construct. Throughout the evaluation process it is important to refer to the original research questions to reflect whether the items retained represent the underlying constructs.

8) Optimize the length of the scale: short scales are less time-consuming for the participants whereas longer scales tend to be more reliable so there is need to be a balance the two factors. If the group sample is sufficiently large then the sample can be split in two: one sample can be used to calculate the various statistical steps described at the earlier step and the second sample can be used to verify the findings and assess the stability of the instrument. A further way to assess stability of the instrument is by test-retest: the scale is distributed to the same group of participants at different times e.g. at 2 weeks or 1 month to compare how stable the findings are.

Although the development, testing and refining process of an instrument may be viewed as a sequential process, in reality the approach follows an iterative procedure with continuous reviewing of the various elements of each step to strengthen the psychometric properties of the scale (Suhonen *et al.*, 2000).

Beliefs about managing symptoms

Beliefs about managing symptoms were measured by 22 new items on a five-point Likert response scale. The items were developed based on themes identified in the literature and from the interviews about the experiences of being unwell with cold and flu symptoms (chapter 6) e.g. beliefs about the effectiveness and the necessity of antibiotics, use of over-the-counter medication in managing RTI or not taking anything. The new items complemented the BMQ-General scale mentioned earlier. The latter scale assesses beliefs about medication in general but does not address all the themes presented above related to the management of RTI symptoms. In addition, there were no other existing scales available assessing beliefs about symptom management. Thus, a list of new items was developed to address the above themes based on examples of specific behaviours and beliefs discussed in the earlier qualitative study. The new items were then grouped into the following thematic categories: beliefs in the necessity of antibiotics (5 items); negative impact of antibiotics (3 items); over-the-counter medication remedies (7 items); home remedies (1 item); supplements (2 items); doing nothing (4 items). The instructions of the scale requested the participants to state their current beliefs for the listed treatments and symptom management methods rather than refer to a specific past event they were unwell as it was requested in the general instructions at the beginning of the study. This change was necessary as there could have been individuals that have not taken anything for their symptoms for that particular event but still held beliefs about symptom management.

Self-efficacy and Outcome Expectations

These are the two main theoretical constructs from the Social Cognitive theory (SCT; Bandura 1986) introduced earlier in chapter 2. The two constructs underlined some of the themes identified in the qualitative study about people's experiences being unwell (chapter 6). Subsequently, the items of both constructs were developed based on themes and specific behaviours identified in the above study. There is no validated questionnaire for the measurement of the SCT constructs related to the context of the RTI symptoms; nonetheless there are a number of guidelines (Luszczynska and Schwarzer 2005) in formulating the items based on the principles suggested by Bandura (1997b).

For self-efficacy, the measurement of this construct commonly focuses on the strength of confidence (Schwarzer 1992a) in carrying out certain activities despite barriers or obstacles. It is normally phrased as: I am confident in... (performing an action or the target

behaviour) even if... (facing a barrier). For example, I am confident I can continue taking care of my symptoms without seeing a doctor (the target behaviour) even if I feel poorly (the barrier). The confidence or self-efficacy in carrying out the target behaviour is assessed against a number of different barriers that might arise when the individual tries to carry out that behaviour. Examples of such barriers can be: 'I cannot carry on with my everyday things', 'the symptoms do not get better', 'my symptoms keep coming back'.

For outcome expectations the formulation of the construct is best expressed with if-then statements: If... (performing an action or the target behaviour), then... (consequence), and these can include both positive and negative consequences that are specific to the target behaviour. For example, if I see my doctor for my symptoms (the target behaviour), then I will feel more reassured (positive consequence or outcome), or it would not make much difference as to whether I got better more quickly (negative consequence or outcome).

In general, the formulation of self-efficacy and outcome expectations in the literature aims to predict the extent to which the target behaviour will be carried out or maintained while considering the possible barriers and consequences of such behaviour. The phrasing of the items commonly refers to events occurring in the present or what may occur in the future, e.g. 'I am confident I can continue taking care of my symptoms without seeing the doctor'. This assumes that people taking part in the study were unwell at the time. However, the study was open to everyone thus it was possible that some people might not have been unwell. For this group of people phrasing items in the present or future tense would encourage them to answer hypothetically which would not necessarily reflect their beliefs based on actual events. Therefore, formulating the constructs in the past would enable people to reflect on an actual experience for which they knew how their symptoms resolved at the end and how certain they felt at the time in continuing their self-care against a list of barriers and consequences. Subsequently, the instructions for the self-efficacy and outcome expectation items were the same as the general instructions of the study: the participants were encouraged to focus on a past event they experienced one or more RTI symptoms for which they considered to seek professional help and answer the related questions.

The examples of barriers and consequences of self-care and seeing the doctor were based on the factors participants stated in the earlier qualitative study (chapter 6) influencing their decision to seek professional help for their symptoms.

The development of the self-efficacy items of this study followed the same principles suggested by Bandura (1997b). Thirteen items (items 1-13) addressed barriers in continuing self-care without seeing the doctor, e.g. I wasn't sure I could continue taking care of my symptoms without seeing the doctor because: it seemed they were getting worse; they were taking longer to ease of that I expected; I felt poorly. The items were phrased in a negative rather a positive framework, e.g. 'I was sure I could take care of my symptoms without seeing a doctor even if I had high temperature for over 2 days', as the latter may have created social desirability bias amongst those who have consulted and perceived such statements as to what they 'ought' to have done; nevertheless the use of negative-worded items may cause confusion in understanding the questions.

The development of the outcome expectation items, in retrospect, did not adhere fully to the principles suggested by the SCT model. As mentioned above, the model depicts that both positive and negative expectations, or consequences, of a target behaviour are elicited in order to assess their influence to the outcome behaviour. However, the items 14-26 addressed expectations or consequences of two behaviours: seeing and not seeing the doctor. In particular, three items 14-16 depicted the negative consequences of not seeing the doctor early, e.g. 'I thought if I didn't go to the doctor early on then it would have taken me longer to recover', whereas items 17-26 depicted the positive consequences of seeing the doctor, e.g. 'I thought if I went to the doctor then I would feel more reassured'. Thus peoples' perceptions of the consequences from the two different behaviours could not be compared with each other in order to assess their impact on whether they have consulted a health care professional. In addition, items 14-16 address consequences of not seeing the doctor *early* which some people might not have agreed with this time frame, as well as not capturing the reasons for consulting later.

The last three items (items 27-29) addressed external factors that, according to the model, could impede seeing the doctor, e.g. 'difficult to get a doctor's appointment when needed', where low scores suggested facing increased obstacles to seek consultation.

All 29 items were on an eleven point Likert-type response scale, ranging from 0 (labelled strongly agree) to 10 (strongly disagree), in accordance with Bandura (1997b) measurement proposal.

The items of both scales, the Beliefs about managing symptoms and the Self-efficacy and Outcome expectations, went through the same development process as explained below: the face and content validity of the items were assessed by the researcher and a panel of experts comprising of academic GPs and a psychologist. The experts ensured that the items represented important attributes of the management of RTI symptoms, captured the range of beliefs in own abilities and skills in self-care without consulting as well as the significant barriers and consequences of self-care and seeing the doctor. In addition, the panel considered the clarity and relevance of the items to the above themes, whether the items were easily understood including the use of technical terminology and leading statements, and whether they were based on simple grammatical construction. Four out of the 22 items concerning the beliefs about managing symptoms were negatively worded to avoid agreement bias. Based on the panel's review no items were deleted from either scale; the wording of 8 items from the beliefs about managing symptoms scale and the wording of 12 items of the self-efficacy and outcome expectations scale was revised. The structure of the instruments was defined based on statistical procedure (principal component analysis) which indicated which items loaded together to form meaningful factor and internal consistency by Cronbach's alpha coefficient. The evaluation of the individual items was assessed by statistical tests such as item means and item-total correlations. No other validated measures were included to assess the performance of the new scales against related constructs, e.g. convergent and divergent validity, as there were too many scales in the study already and they would further add to the time in completing the study. Nonetheless, this was a limitation of the study in appraising further the psychometric properties of the new scales. As mentioned earlier the new scales were first checked by a panel of experts however, they were not pilot-tested with a sample of the target population prior the main data collection to identify any problems. This was due to time restriction in the commencement of the study and distribution of the questionnaires. In addition, there was no opportunity to run test-retests as the scales were administered once.

Last time being unwell

Participants were asked to indicate the last time they were unwell due to a respiratory infection for which they considered to consult by selecting one of the six available options: currently unwell, a few weeks ago, a few months ago, a few years ago, can't remember, don't know.

7.2.4 Statistical Methods

The data was screened for missing data, univariate and multivariate outliers, singularity and multicollinearity i.e. having scores over 0.80 in the correlation matrix. Subsequently, predictors were checked for multicollinearity with the VIF and tolerance levels statistics. None of the predictors had VIF scores greater than 10 and tolerance levels less than 0.10 which are the critical values for evidence of collinearity. Normal distribution was assessed based on histograms, skewness and kurtosis scores. Alpha level was set at 0.05; in case of multiple correlations the p-value was set to 0.01 to minimize Type I error. The Bonferroni corrections were not applied due to the conservative nature of the test.

Exploratory factor analysis (principal component analysis) was carried out on the items of each of the constructs developed for the purposes of this study, i.e. self-efficacy, outcome expectations, and the beliefs about managing symptoms, in order to reduce them into meaningful factors. Preliminary factor extraction for each construct suggested that the emerging factors were interrelated thus an oblique rotation (direct oblimin) would provide a better structure. The criteria for the number of factors to be retained were based on: eigenvalues greater than 1, scree plot diagrams and factor loadings of 0.3 or higher. When an item had loadings higher than 0.3 on more than one factor, it was included in the factor in which it had the greatest absolute value. The internal consistency of each factor solution was assessed by Cronbach's alpha coefficient.

The data were checked and screened before proceeding with the factor analysis. To check for outliers, all variables were standardized into z-scores. The great majority of cases (95%) are expected to have absolute values of less than the 1.96 z-score boundary, 5% (or less) with an absolute value greater than 1.96, and 1% (or less) with an absolute value greater than 2.58 (Field 2009). Any values outside these ranges are considered as outliers. No extreme values were found as all cases were below 2.58. To check the percentage of missing data, a dummy variable was created which showed that no variable had more than 5% of missing values. Separate variance t-tests were carried out for missing value analysis, i.e. whether the missingness of one variable was related to the missingness of the other variables (Tabachnick and Fidell 2007) which showed that such pattern was at random.

Bivariate associations between the predictors and the outcome were assessed using point-biserial correlations, in case of continuous predictors, or chi-square in case of categorical predictors. A series of cross-tabulations were carried out to check whether there were

enough cases for each category of the categorical predictors. If the latter was not observed, then the categories with the fewer cases were merged with the next or previous one, or they were dichotomized.

The bimodal outcome necessitated the use of logistic regression to assess the strength of the independent variables in predicting consultation. In order to assess the assumption of linearity between the continuous variables and the logit of the outcome variable, the interaction of the log transformation of each predictor with the actual predictor was assessed – in case the interaction was significant the continuous variable was entered as categorical (Hosmer and Lemeshow 1989).

Residual statistics were also checked in order to assess the degree to which the models fitted the data. Statistics such as standardised residuals were examined to isolate points for which the model fitted poorly, e.g. cases that were close or above 3, as well as statistics such as DFBeta and Cook's distance to identify points that exerted undue influence on the model, e.g. cases over 1.

Variables significantly related with the consultation outcome were entered in a multivariate logistic regression model. The first block of the regression included the variables that were previously found in past studies to have a significant contribution in predicting consultation. All the remaining variables were entered in Block 2 to assess their additional contribution, if any, towards the outcome variance. Variables were forced into the model within each block.

Statistical analysis was carried out using SPSS (version 20).

7.3 Results

7.3.1 Participants

During the time period the online questionnaires were available, there were 385 visits to the site, and 295 participants completed the study, a response rate of 76.6%. However, there was no record how many people received the study-link and did not activate it, thus it is not possible to calculate the overall response rate of the online recruitment. One hundred and thirty questionnaires (n=130) were sent out in print and 28 were completed

and returned, giving a response rate of 21.5%. In total, there were 323 completed questionnaires.

The great majority of the sample was females (n=251, 78.4%). The age range of the participants was 16 to 80 years (Mean = 22.80, SD = 9.24, Median=20.0) but it was greatly skewed towards the younger end with 56.5% being between 18-22 years. Related to the younger age sample, most of the participants of the above age group (n=135, 43%) had attained A'levels as their highest educational level. Overall, 62% were students at the time of completing the study and 19% were in part-time employment.

Concerning medical unexplained symptoms (MUS), 80% of the participants had at least one MUS (M =3.75, SD= 3.99), and the three most frequent symptoms were: feeling nausea (n = 80, 25%), back pain (n=72, 22.5%) and feeling bloated (n=69, 21.6%). Sixty two percent of participants indicated having at least one chronic medical problem (M = 1.27, SD = 1.90), with the most frequent being asthma (n=59, 18.3%) followed by eczema (n=53, 16.5%) and migraine (n=52, 16.2%). Most of the participants indicated the last time they were unwell due to respiratory tract symptoms for which they considered to consult was a few months ago (n=108, 34%) followed by a few years ago (n= 84, 26%) and a few weeks ago (n= 81, 25%). Over half of the participants indicated that they visited their GP for the particular event they recalled being unwell due to one or more RTI symptoms (n=190, 59%).

7.3.2 Questionnaire scales

As mentioned earlier, two scales were developed for the needs of this study, a) the beliefs about managing symptoms, and b) the self-efficacy and outcome expectations of self-care and consultation. Factor analysis was carried out for both scales to identify if the items could be reduced and clustered into common factors. The following section presents the findings of this process.

7.3.2.1 Factor analysis

Beliefs about managing symptoms

Four factors with eigen value>1 were identified which accounted for 51% of variance. Factor 1, labeled as beliefs in the necessity of antibiotics, had five items (items

2,8,10,22,26; score range 5-25; high scores indicated that antibiotics were not necessary); factor 2, labelled as beliefs in the effectiveness of supplements and over-the-counter (OTC) remedies both as preventative and palliative care, had 6 items (items 3,5,11,15,27,28; score range 6-30; high scores indicated increased beliefs in the effectiveness of supplements and OTC); factor 3, labelled as belief in the negative impact of antibiotics, had 3 items (items 1,4,7; score range 3-15; high scores suggested increased beliefs about the negative impact of antibiotics); factor 4, named as symptoms resolving on their own, had 4 items (items 12,14,29,30; score range 4-20; high scores indicated a belief in taking nothing to deal with the symptoms and that symptoms can resolve on their own). Four items (6, 9, 13, 23) were not included as they had loadings lower than 0.30, these were: item 6: taking over-the-counter remedies for my symptoms can give me side-effects; item 9: over-the-counter remedies don't stop my symptoms from coming back; item 13: I prefer taking home remedies because they are cheaper and help my symptoms; item 23: over-the-counter remedies can make symptoms go away quicker. Table 14 presents the descriptive statistics and factor loadings for each item.

Table 14 Factor loadings of the beliefs about managing symptoms subscales

Items of each factor	Factor loadings	Item Mean	Item SD	Item-total correlation
Factor 1: Beliefs in the necessity of antibiotics				
2) Antibiotics are not appropriate for my symptoms	0.49	2.70	1.08	0.48
8) I need to take antibiotics to get better quickly (r)	0.70	3.18	1.09	0.66
10) Without antibiotics my symptoms will get worse (r)	0.65	3.28	1.03	0.58
22) Antibiotics stop the infection from spreading (r)	0.69	2.63	0.88	0.36
26) Antibiotics help recover from my infection quicker (r)	0.78	2.53	0.92	0.61

Table 14 (*continued*)

Items of each factor	Factor loadings	Item Mean	Item SD	Item-total correlation
Factor 2: Effectiveness of supplements and OTC				
3) My symptoms start to feel better when I'm taking over-the-counter remedies	0.72	3.24	0.97	0.56
5) Taking supplements such as vitamins helps the immune system to fight off the infection	0.56	3.58	.88	0.52
11) I take over-the-counter remedies for my symptoms because they make my symptoms not feel as bad	0.87	3.44	1.04	0.61
15) Taking over-the-counter remedies can smooth my symptoms	0.86	3.59	.89	0.63
27) I can carry on with my everyday things when I take over-the-counter remedies	0.55	3.30	.88	0.48
28) Taking supplements such as vitamins frequently can help not to get an infection	0.48	3.33	.93	0.51
Factor 3: Negative impact of antibiotics				
1) Antibiotics can be harmful to the body	-0.79	2.92	1.13	0.57
4) Taking antibiotics worries me as they can make the body depend on them.	-0.77	2.60	1.06	0.57
7) Taking antibiotics for my symptoms does more harm than good as they can make infections harder to treat in the future.	-0.78	2.78	1.11	0.60
Factor 4: Belief in symptoms can resolve on their own				
12) My symptoms resolve on their own without taking anything	-0.82	2.90	1.03	0.64
14) The body can deal with the symptoms on its own without having to take anything	-0.83	3.02	1.03	0.62
29) Only time can help my symptoms.	-0.54	2.62	0.97	0.46
30) I prefer doing nothing about my symptoms and letting the body to recover on its own	-0.73	2.68	1.14	0.60

Pearson correlations indicated that the Beliefs in the necessity of antibiotics factor (factor 1) were significantly related to Beliefs about the negative impact of antibiotics (factor 3) and to Belief that symptoms can resolve on their own (factor 4); the latter two factors were also significantly inter-related i.e. high scores indicating beliefs that antibiotics are not necessary were positively related to beliefs that symptoms can resolve on their own (Table 15).

Table 15 Interrelationships between symptom management factors

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.00			
Factor 2	-0.07	1.00		
Factor 3	0.29*	0.12	1.00	
Factor 4	0.51*	0.01	0.34*	1.00

* p<0.001

Self-efficacy and outcome expectations

For the self-efficacy items, principal axis factoring generated a factor structure that was easier to interpret than the principal component analysis; in addition, it produced fewer differences or residuals between the observed and reproduced correlations than the principal component analysis (5% vs. 38% respectively), thus the solution by principal axis factoring method was preferred. The emerging factors, the factor loadings and the descriptive statistics of each item are presented in Table 16.

Three factors were identified explaining 62.65% of the variance. Five items loaded highly on Factor 1 forming a subscale addressing self-efficacy in self-care related to persistent symptoms (items 3, 10-13; score range 0-50); three items loaded highly on Factor 2 referring to self-efficacy in self-care related to past experiences (items 6-8; score range 0-30); and finally Factor 3 had four items referring to self-efficacy in self-care related to the impact of acute symptoms (items 1,2,5,9; score range 0-40). Item 4, namely 'They (symptoms) were unusual and I have never had them before', was not included due to low factor loadings. Low scores suggested low self-efficacy in self-care due to each of their corresponding barriers.

Table 16 Factor loadings of the self-efficacy beliefs subscales

Items of each factor	Factor loadings	Item Mean	Item SD	Item-total correlation
Factor 1: Self-efficacy for self-care due to: persistent symptoms				
3) They were taking longer to ease off than I expected	0.62	3.55	2.81	0.73
10) They were going on for too long	0.86	3.67	2.92	0.80
11) They didn't seem to get better	0.96	3.51	2.89	0.87
12) My friends and/or family were advising me to see the doctor	0.66	3.95	3.19	0.72
13) They kept coming back	0.52	4.48	2.98	0.47
Factor 2: Self-efficacy for self-care due to: past experiences				
6) I have seen the doctor for a similar situation in the past	0.91	4.91	3.43	0.65
7) I was given a prescription in the past for similar symptoms	0.86	5.04	3.52	0.69
8) My immune system is usually weak most of the time	0.37	5.91	3.29	0.35
Factor 3: Self-efficacy for self-care due to: impact of symptoms				
1) It seemed they were getting worse	-0.46	3.78	2.82	0.64
2) I had a high temperature for over 2 days	-0.33	4.65	3.15	0.32
5) I felt poorly	-0.72	3.82	3.17	0.53
9) I couldn't carry on with my everyday things	-0.60	4.19	2.99	0.65

None of the factors were normally distributed thus their intercorrelations were assessed with Spearman's ρ . All three factors were significantly intercorrelated, with the highest association between self-efficacy in self-care related to persistent symptoms (factor 1) and

self-efficacy in self-care related to the impact of symptoms (factor 3) as table 17 shows below.

Table 17 Interrelationships between self-efficacy factors

	Factor 1	Factor 2	Factor 3
Factor 1	1.00		
Factor 2	0.16*	1.00	
Factor 3	0.62*	0.21*	1.00

*p<0.01

Factor analysis of the outcome expectations items was carried by principal axis factoring as there were fewer residuals with absolute values greater than 0.05 in the reproduced correlations matrix compared to principal component analysis (27% vs. 56% respectively). Preliminary factor analyses showed that item 21, namely 'I thought if I went to the doctor then I would feel awkward if I wasted their time', had 0.41 on the anti-image correlation matrix which fell below the 0.50 mark for sampling adequacy (Field 2009) thus it was excluded and the analysis was re-run without it. Both the scree plot test and the eigen values >1 suggested a two-factor solution, shown in Table 18, explaining 56.73% of the variance. Eight items loaded on Factor 1 (items 17-19, 22-26; score range 0-80) referring to the positive consequences of seeing the doctor: getting reassurance and getting a prescription for a quicker recovery. The second factor comprised three items (items 14-16; score range 0-30) referring to the negative consequences of not seeing the doctor early on: symptoms getting worse and complicated. Two items were excluded due to loadings lower than 0.30 i.e. item 20, namely 'I would get a sick leave to have more time to rest', and item 21 'I would feel awkward if I wasted their time'. As mentioned earlier in the development of the outcome expectations sub-scale (see earlier section 7.2.3.2 Development of new measurement instruments), the items addressed the consequences of two separate behaviours: seeing and not seeing the doctor. Thus the two components arising from the factor analysis reflected the clustering of the items under each behaviour. Low scores suggested strong beliefs in positive consequences from seeing the doctor (Factor 1), and strong beliefs in negative consequences from not seeing the doctor early on (Factor 2).

Table 18 Factor loadings of the outcome expectations subscales

Items of each factor	Factor loadings	Item Mean	Item SD	Item-total correlation
Factor 1: Positive consequences from seeing the doctor: getting reassurance and prescription for a quicker recovery				
17) I would definitely know whether my symptoms were serious or not	0.60	3.64	2.91	0.68
18) I would get a stronger medication to recover quicker	0.78	3.65	2.83	0.79
19) I would feel more reassured	0.62	3.70	2.74	0.70
22) It would not make much difference to whether I got better more quickly (r)	-0.49	4.75	2.65	0.44
23) I would get a prescription and be able to get back to everyday life more quickly	0.77	3.93	2.78	0.76
24) I would get better more quickly	0.89	3.76	2.98	0.80
25) My symptoms wouldn't get worse	0.83	3.97	2.88	0.74
26) My symptoms wouldn't take long to ease off	0.86	3.83	2.78	0.78
Factor 2: Negative consequences of not seeing the doctor early: symptoms getting worse				
14) My symptoms would get worse or get more complicated	0.65	4.11	3.06	0.75
15) It would have taken me longer to recover	0.56	4.09	2.96	0.69
16) My symptoms might have developed into something more serious	0.76	4.39	3.06	0.73

(r) Indicates reverse scored items

None of the factors were normally distributed; Spearman's ρ showed a positive correlation, $\rho=0.59$ $p<0.001$, indicating that as beliefs that doctors will provide reassurance and prescription for a quicker recovery increase, so do the beliefs that symptoms will get worse if not seeing the doctor early.

Factor analysis of the last three items which represented difficulties in consulting (items 27-29, namely item 27: Where I live it is difficult to travel from home to see the doctor; item 28: I am not sure where to find out relevant health information without seeing the doctor; item 29: In my area it is difficult to get a doctor's appointment when I need it), indicated no meaningful interpretation and had low alpha level ($\alpha=0.57$) which increased slightly to 0.60 if item 28 was removed. Thus it was decided to exclude all three items from subsequent analysis.

7.3.2.2 Descriptive statistics of all the scales

All the descriptive and reliability statistics of both the validated and new scales are presented in Table 19.

Table 19 Descriptive and Reliability statistics of all the scales

Scale (theoretical score range)	Mean	SD	Cronbach's α	Observed score range
<i>Beliefs about Medication:</i>				
Medication Overuse (4-20)	11.13	3.09	0.77	4-19
Medication Harm (4-20)	8.97	2.60	0.69	4-20
<i>Beliefs about managing symptoms:</i>				
Beliefs in the necessity of antibiotics (5-25)	14.34	3.61	0.76	5-25
Effectiveness of supplements and OTC (6-30)	20.43	3.96	0.80	6-29
Negative impact of antibiotics (3-15)	8.28	2.21	0.75	3-15
Symptoms can resolve on their own (4-20)	11.23	3.22	0.78	3-20
<i>Self-efficacy in self-care related to:</i>				
Persistent symptoms (0-50)	19.06	12.05	0.88	0-50
Past experiences (0-30)	15.78	8.22	0.73	0-30
Impact of symptoms (0-40)	16.41	9.05	0.73	0-40
<i>Outcome expectations</i>				
Positive consequences of seeing the doctor (0-80)	31.23	17.63	0.91	0-78
Negative consequences of not seeing the doctor (0-30)	12.49	7.92	0.85	0-30
<i>Illness Perception Beliefs:</i>				
Timeline acute/chronic (6-30)	15.73	3.71	0.69	6-28
Timeline cyclical (4-20)	10.67	3.30	0.81	4-20
Consequences (6-30)	12.69	4.09	0.77	6-25
Personal control (6-30)	19.98	4.02	0.78	8-30
Treatment control (5-25)	18.03	3.39	0.78	6-25
Illness coherence (5-25)	11.01	4.23	0.92	5-25
Emotional representations (6-30)	15.30	4.62	0.82	6-27
<i>Health anxiety</i> (number of yes scores- out of 14)	3.22	2.79	0.80	0-14
<i>Negative Attitudes to doctors scale</i> (6-36)	25.79	4.20	0.61	12-32
<i>Personality Questions (single items)</i>				
Often need to reattend to get the right treatment (1-6)	4.09	1.30	N/A	1-6
I usually try the chemist first (1-6)	3.03	1.39		1-6

Table 19 (continued)

Scale (theoretical score range)	Mean	SD	Cronbach's α	Observed score range
<i>Rate your health (1-4)</i>	1.80	0.62		1-4
<i>Health Status (single items)</i>			N/A	
Physical condition (1-5)	1.76	0.94		1-5
Emotional condition (1-5)	2.62	1.19		1-5
Daily work (1-5)	1.72	0.84		1-5
Social activities (1-5)	1.89	1.01		1-5
Pain (1-5)	2.10	1.00		1-5
Change in condition (1-5)	2.61	0.95		1-5
Social support (1-5)	2.80	1.01		1-5
Quality of Life (1-5)	2.00	1.04		1-5
Overall condition (1-5)	2.29	0.83		1-5

If any one of the items were deleted from the scale, there was no change in the internal consistency reliability of the scale supporting the homogeneity of the scales. The majority of the scales had satisfactory alpha level. The lowest score was for the Negative Attitudes scale, 0.61 compared to 0.67 found by Marteau (1990).

7.3.3 Bivariate correlations between predictors and outcome

Some categorical predictors did not have enough cases at each level to allow meaningful analysis thus the number of their levels were reduced. These predictors were: education, ethnicity, employment, where do you live, and rate your health. In addition, the following single ordinal variables, all part of the Health status scale, were reduced to three levels: daily work, social activities-interference, pain, social support-availability, capability for strenuous activities. Finally, the distribution of certain continuous variables was skewed thus they were converted into categorical variables, these were: age, alcohol intake, medical problems, medical unexplained symptoms, and health anxiety. Due to the large number of variables, the bivariate correlations are presented in three separate tables for easy of reference (Tables 20 - Table 22) including the variables above with their new categories.

Table 20 Correlations between consultation visits, socio-demographic and lifestyle variables

		Consultation		Chi-square analysis
		Yes	No	
		(N= 190)	(N=130)	
Gender	females	150	101	$\chi^2 (1)= 0.07, p=0.79$
	males	40	29	
Age	16-17	22	32	$\chi^2 (3)= 10.68, p=0.01$
	18-22	109	70	
	23-39	47	21	
	≥ 40	10	6	
Ethnicity	white	176	112	$\chi^2 (1)= 3.59, p=0.06$
	non-white	14	18	
Education	up to and including A-level	115	90	$\chi^2 (1)= 2.47, p=0.12$
	Diploma or over	73	39	
Live	University Halls	35	16	$\chi^2 (3)= 8.41, p=0.04$
	Living with parents	45	44	
	Alone	14	3	
	Living independently with others	96	67	
Work	paid profession	44	65	$\chi^2 (1)= 0.11, p=0.74$
	student	85	116	
Alcohol (units per week)	0	20	31	$\chi^2 (3)= 1.53, p=0.67$
	1-7	62	91	
	8-15	34	54	
	>15	13	12	
Smoking	never	93	137	$\chi^2 (2)= 1.13, p=0.57$
	Ex-smoker	23	27	
	current	14	26	

Table 21 Correlations between consultation visit, health problems, attitudes to doctors, and health anxiety

	Consultation		Chi-square analysis
	Yes	No	
	(N= 190)	(N=130)	
Medical problems	0	65	55
	1	56	42
	2	34	18
	3+	35	15
Medically unexplained symptoms	0	35	26
	1-2	49	40
	3-5	54	24
	6+	44	36
Health Anxiety	0	12	8
	1-2	94	60
	3-5	47	33
	6+	37	29
Rate your health	Very good	59	39
	Good	112	77
	Poor	19	13
Capability of strenuous activity			$\chi^2 (2)= 3.16, p=0.21$
Daily work			$\chi^2 (2)= 3.67, p=0.16$
Social activities – interference			$\chi^2 (2)= 3.13, p=0.21$
Pain			$\chi^2 (2)= 3.77, p=0.15$
Social support-availability			$\chi^2 (2)= 1.67, p=0.43$
Emotional Condition-negative			rbp = 0.29, p<0.00*
Change in physical and health condition			rbp = -0.04, p=0.44
Overall condition			rbp = 0.25, p<0.00*
Quality of Life			rbp = 0.15, p=0.01
Negative Attitudes to doctors			rbp = 0.14, p=0.01
Often need to re-attend to get right treatment			rbp = -0.11, p=0.06
Usually try the chemist first			rbp = 0.23, p<0.00*

* p<0.01

Correlations between socio-demographic and lifestyle variables, health problems and consultation outcome were small and only three were statistically significant. As Table 21 shows, seeking professional help for RTI was significantly correlated with being in negative circumstances both emotionally and in overall health (i.e. physical and emotional), and more likely to disagree with the statement of seeking help from the chemist prior seeing the doctor.

Table 22 Point-biserial correlations between consultation visit and illness and medication beliefs, self-efficacy and outcome expectations

Variable	Consultation
Medication Overuse	rpb = -0.003, p=0.96
Medication Harm	rpb = -0.09, p=0.11
Necessity of antibiotics	rpb = -0.29, p<0.00*
Effectiveness of supplements and OTC	rpb = -0.16, p=0.01
Negative impact of antibiotics	rpb = -0.08, p=0.16
Symptoms can resolve on their own	rpb = -0.41, p<0.00*
Self-efficacy-persistent symptoms	rpb = -0.12, p=0.03
Self-efficacy-past experiences	rpb = -0.19, p=0.001*
Self-efficacy-impact of symptoms	rpb = -0.16, p=0.003*
Positive consequences of seeing the doctor	rpb = -0.11, p=0.05
Negative consequences of not seeing the doctor	rpb = -0.16, p=0.01
Timeline acute/chronic	rpb = 0.12, p=0.03
Timeline cyclical	rpb = 0.06, p=0.32
Consequences	rpb = 0.11, p=0.05
Personal control	rpb = -0.002, p=0.97
Treatment control	rpb = 0.16, p=0.004*
Illness coherence	rpb = 0.09, p=0.12
Emotional representations	rpb = 0.16, p=0.003*

* p<0.01

As Table 22 shows, most of the correlations were small and non-significant. Four of the significant correlations included factors that emerged from two of the newly developed scales of this study i.e. beliefs about symptom management and self-efficacy. In particular,

consultation was significantly associated with beliefs that antibiotics are necessary and that symptoms do not resolve on their own. In terms of self-efficacy, consultations were associated with low beliefs in self-efficacy for self-care due to past experiences with professional care (e.g. seeing the doctor, getting a prescription), and due to the impact of symptoms. In addition, those indicating consulting for their symptoms held stronger beliefs that treatment can control their symptoms and the latter were cause of concern and worry.

7.3.4 Logistic Regression

The predictors were entered into two blocks: the first block included the variables arising from the past literature i.e. emotional condition; overall condition; usually try the chemist first. The second block included the psychological variables i.e. necessity of antibiotics; symptoms resolve on their own; self-efficacy for self-care due to past experiences with professional care, and due to the impact of symptoms; beliefs in treatment control; beliefs in emotional representations.

There were four cases with standardised residuals >3 thus their statistics, DFBeta and Leverage were explored further and were found to be within normal range.

Results, as shown in Table 23, indicated that the variables in block 1 distinguished between participants who did and did not consult ($\chi^2 (3) = 17.47$, $p=0.001$) accounting for 8% of the variance in consultation (Nagelkerke $R^2 = 0.08$). From this set of variables, only the variable 'Usually try the chemist first' was significantly associated with consultation; a one point increase in the strength of the predictor, indicating disagreement in trying medicines from the chemist before seeing the doctor, increased the odds of consulting by 44%. The addition of beliefs about symptoms, self-efficacy and illness beliefs in block 2 improved the predictability of the model ($\chi^2 (6) = 64.90$, $p<0.0001$), and the explained variance increased to 32% (Nagelkerke $R^2 = 0.32$). The only variable to emerge significant from block 2 was 'Belief that symptoms can resolve on their own' indicating that one point increase in the strength of beliefs that symptoms can resolve on their own, reduced the odds of consulting by 23%.

Table 23 Logistic Regression: factors predicting consultation

Variable	Odds ratio (95% CI)
Block 1	
Emotional Condition	1.04 (0.83 to 1.31)
Overall Condition – physical and emotional	1.01 (0.78 to 1.32)
Usually try the chemist first	1.44 (1.21 to 1.73)*
Block 2	
Necessity of antibiotics	0.94 (0.86 to 1.03)
Symptoms can resolve on their own	0.77 (0.69 to 0.86)*
Self efficacy – past experiences	0.97 (0.94 to 1.01)
Self-efficacy – impact of symptoms	0.98 (0.95 to 1.01)
Treatment control	1.04 (0.95 to 1.14)
Emotional representations	1.04 (0.98 to 1.11)

*p<0.001; CI: Confidence Interval

The model correctly classified 83.3% of participants that have consulted and 63.2% of those that have not consulted, with an overall predictive success rate of 75%.

7.4 Summary

The questionnaire study indicated two factors that were significantly associated with consultation at the final model i.e. strong beliefs in seeking help from the chemist, or pharmacist, before seeing the doctor and strong beliefs that symptoms can resolve on their own were associated with reduced likelihood to seek professional help when unwell. None of the social cognitive factors, i.e. self-efficacy and outcome expectations, were significant associated with consultation in the final model although two self-efficacy factors (i.e. past experiences and impact of symptoms) were significantly associated with consultation in the bivariate calculations as two of the illness perceptions factors (i.e. treatment control and emotional representations).

The next and final chapter of the thesis discusses the findings from all the empirical studies of the thesis and examines how they can inform further development of the intervention.

Chapter 8 Discussion

8.1 Aim of this chapter

The aim of this chapter is to provide a general discussion of the research of the thesis in relation to the previous literature and the empirical evidence of the earlier chapters. The chapter is divided in five parts:

The first part summarizes the main findings of the empirical studies of this research programme and the extent they meet the aims of the thesis. The second part of this chapter then discusses the limitations of the research; the third part considers the research implications of the findings in relation to existing research. The fourth part discusses arising recommendations for policy and practice and the final part of the chapter suggests questions and directions for future research.

8.2 Main findings of the empirical studies

The primary aim of this thesis was to present the development of the prototype of a theory-based web intervention to support decision-making of the general adult population on whether to seek professional help or self-care for acute respiratory tract infections; the intervention focused on five cold and flu-type symptoms: cough, runny or stuffy nose, ear ache, sore throat, and pain or pressure in the face. The development of the prototype intervention, as presented in chapter 4, was achieved by building upon the findings from the systematic review in chapter 3 and the literature review in chapter two. A secondary aim of the thesis was to identify the theoretical components and technical characteristics of the intervention. Three empirical studies highlighted various theoretical components and technical characteristics for the intervention; there were two qualitative studies, in chapters five and six respectively, and a survey study in chapter seven. The main findings from the systematic review and the three subsequent empirical studies are presented below.

8.2.1 Chapter 3: Health education interventions for minor ailments: a systematic review

The systematic review of this research had three aims: a) to identify the effectiveness of health educational materials addressing minor ailments, as a single or as part of a multiple intervention, in improving outcomes such as health service use; b) to explore whether characteristics of the health education materials e.g. the format of delivery could influence

outcomes; c) to identify which theoretical constructs, if any, informed the educational materials. Databases were searched up to the first week of February 2014 and 22 articles based on 18 trials were included in the review. To address the first aim of the systematic review, identifying the effectiveness of health educational materials, five intervention comparisons were used to synthesize the findings; narrative synthesis of data indicated the following main findings for each comparison:

a) Comparison of patient health information vs. no intervention (for these outcomes present them as a whole).

The majority of the eleven trials using this comparison delivered the intervention materials via post to the target population without prior knowledge whether the individuals were unwell or not. Five trials assessed the effectiveness of patient health information on consultation for minor ailments with mixed evidence and methodological quality. Two trials reported fewer consultations for the intervention groups although they were rated as low quality; other studies indicated no difference between the groups whereas the last study reported fewer consultations with the receipt of a summarised form of information rather a detailed one. Six trials assessed the outcome of consultations in general and similar to the outcome of consultations above there was no consistent pattern of findings. Half of the trials reported reduced number of visits for the intervention groups although the studies were rated with a likely risk of bias. The remaining trials did not find differences between the groups. Finally, re-consultations for minor ailments may be reduced if intervention groups received the information leaflets during the consultation to adults rather to parents of young children.

b) Comparison of patient health information vs. health information given for other symptoms and/or conditions.

The intervention materials of two trials given either in person during consultation or via post did not show any difference compared to the control in respect to outcomes such as antibiotic prescription, general consultations or re-consultations.

c) Comparison of patient health information vs. multiple interventions including patient health information.

Two studies, based on the above comparison, assessed antibiotic prescription and appropriateness of health-care use; no differences were found between the intervention and the control groups. A third trial assessed the impact of the intervention on cost savings;

estimated savings were higher for the intervention group, however the study was done over 30 years ago and the estimations then may not relate to the current costs.

d) Comparison of patient health information as part of a multiple intervention vs. multiple intervention without patient health information.

Two trials compared verbal advice and information leaflets for re-consultation rates; there were no differences between the intervention and the control group within a month and within year of the initial consultation. There was mixed evidence for the outcome of antibiotic use: one trial indicated lower re-consultation rates whereas the other found no differences between the groups, both trials were assessed as having minimum risk of bias.

Regarding the second aim of the systematic review none of the trials compared and evaluated the characteristics of the intervention materials such as the format or setting of the interventions. The trials were grouped under a broader category of interactive (i.e. materials given in person) vs. non-interactive (i.e. materials sent via post) interventions; the findings indicated that most of the interventions sending materials via post showed fewer consultations for MA and consultations in general than the control group. Re-consultations for MA were examined only by the interactive studies with mixed results compared to the control group. A short version of the intervention focusing on a smaller number of MA symptoms was related to fewer consultations compared to a more detailed presentation of the materials.

The third aim of the review explored the theoretical basis of the interventions. The findings indicated that the majority of the trials did not explicitly use a theoretical framework or theoretical components to develop their interventions. The underlying assumption was that seeking professional help was due to inadequate information or misconceptions regarding the cause of the symptoms, the duration, the severity and the way they can be controlled. Thus provision of information could address this gap and subsequently influence behaviour. There were two exceptions where the studies used constructs from the social cognitive theory and theory of planned behaviour to develop their intervention. However, one of the studies was underpowered whereas the other did not indicate which theoretical constructs were included from the theory of planned behaviour.

8.2.2 Chapter 5: the usability and acceptability of the tailored web intervention: a qualitative study

The purpose of this study was to pilot the intervention materials in order to elicit feedback on the usability, comprehension and acceptability regarding the content and the format of the materials. The study was based on qualitative design and elicited comments and suggestions from 21 participants via the think aloud method. The main findings regarding the content of the materials included comments about the information being helpful, interesting and reassuring, as well as matching personal experiences. Feedback also included suggestions to reduce the length of information presented, making questions clearer of when to see the doctor, introduce more tailoring and to include additional symptoms at the screening section. Participants also commented that the duration of symptoms indicated at the screening section was too long before seeking help compared to own past experiences and similarly, the advice on the waiting period before seeking professional help was longer compared to earlier personal incidents. The comments regarding the format of the materials included preference for more interaction with the programme i.e. able to choose how much to read, the availability of email facility to contact a clinician if further help was required and adding more pictures to break long texts.

8.2.3 Chapter 6: what are the factors that make people seek professional help for cold and flu symptoms.

The purpose of the second qualitative study was to further the theoretical premises of the intervention regarding the factors that could explain adults' illness experiences when unwell with cold and flu symptoms and their subsequent behaviour.

There were 21 semi-structured interviews, from the same participants as in the usability and acceptability study (chapter 5), and the data were analysed based on grounded theory approach and techniques. The synthesis of the findings indicated that individuals go through a cycle of evaluating their current symptoms where they compare the existing situation against previous experiences of being unwell, past experiences with symptom management and health services as well as possible influence from external social networks. The decision on what to do was constantly evaluated against their beliefs illustrated above as well as the effectiveness on their symptom management.

Their decision to consult was linked to the uncertainty they felt whether their symptom(s) suggested something more serious, the longer duration than anticipated, the impact on their everyday life, the need for reassurance and the antibiotic prescription they received in the past for similar symptoms. The theories closely identifying with the arising constructs were Social Cognitive theory, the Common Sense of Illness Representations, and the Beliefs about Medication.

8.2.4 Chapter 7: identifying the most significant predictors of consultation for cold and flu symptoms

The last empirical study of the thesis aimed to identify the most significant variables linked to the decision to consult for respiratory tract infections including cold and flu symptoms. The range of clinical and theoretical variables included in the study was based on the findings from the qualitative study in chapter 6 and from earlier studies that investigated the factors involved in the decision to consult (Little *et al.*, 2001b; van Duijn *et al.*, 2007). Some of the variables, namely beliefs about managing symptoms, self-efficacy and outcome expectations, did not have validated scales so three corresponding measurement instruments were developed for the purpose of this study.

Logistic regression indicated that the strongest variables linked to the decision to consult were a strong belief in seeking help from the chemist before seeing the doctor and a strong belief that symptoms can resolve on their own. Both variables were associated with reduced likelihood to consult.

8.3 Limitations

Some of the limitations of this research programme were study-specific whereas others were applicable across studies. Overall, the limitations were linked to the following five areas: a) methodological issues of the systematic review; b) recruitment of the participants; c) issues related to the development and the presentation of the intervention; d) eliciting and analysis of the qualitative data; e) the design of the survey. Each limitation is discussed in detail below.

8.3.1 Methodological issues of the systematic review

The systematic review had a broad focus looking at various health information methods for a broad number of conditions and symptoms. This created a rather complex picture to delineate findings. An alternative direction of the review could be focusing solely on

ARTI. However, this could have excluded trials that addressed ARTI as part of a wider number of minor ailments (e.g. Heaney *et al.*, 2001; Little *et al.*, 2001c). Secondly, the search strategy was limited to studies published in English language due to lack of available resources to translate articles from other languages and this might have led to missing potential relevant literature. In addition, focusing on studies from European countries and US may have limited the generalisability to other countries or settings. Thirdly, the list of minor ailments included in the search strategy does not reflect the range of symptoms that could be potentially included under this term thus possibly making the search strategy less comprehensive and sensitive. The difficulty in identifying a shared and encompassing definition to set the parameters in the identification and retrieval of relevant studies has been an ongoing problem through this research. As mentioned earlier, the scoping searches carried out at the early stages of the review assisted in making the search strategy more focused and helped to identify studies that addressed a wide range of symptoms.

8.3.2 Recruitment of the participants

The qualitative studies in chapters 5 and 6 had a rather homogeneous group of participants in terms of their demographics, socio-economic and ethnic background. Although it was not the purpose of the current studies to investigate differences based on these dimensions, it appears to be an important aspect for future investigation. There is some evidence that suggests that frequent consultation behaviour in primary care is generally associated with being female or elderly or with factors such as unemployment, lower social class, and coming from an ethnic minority group (Carr-Hil *et al.*, 1996; Gill and Sharpe 1999; Scaife *et al.*, 2000; Robles *et al.*, 2009). However such associations are far from consistent (Saxena *et al.*, 2002) and focus primarily on consultations in general. In addition, there is no evidence of a significant pattern of frequent consultation related to specific morbidities. Foster *et al.* (2006) investigated whether frequent consultation was related to specific illnesses and showed that, in general, there was no significant pattern among particular groups of conditions. Another limitation was related to the fact that all participants completed secondary education and they had some knowledge using the internet although this varied enormously e.g. some used it on a daily basis whereas others very rarely. Nonetheless, it is possible that eliciting feedback from participants of lower educational level and with little or no knowledge of using the internet may have provided a rather different feedback. A similar issue was observed in the survey study (chapter 7) where most of the participants were recruited online and this required having skills with a certain

level of computer-literacy (Kraut *et al.*, 2004). As already mentioned in the study, online recruitment can be a quick and economical medium for research, however it limits the generalisability of findings due to the self-selection bias and the restricted demographic profile of the internet users taking part i.e. the majority of the participants were young with minimum secondary education thus limiting the findings to the wider population. Finally, the recruitment advert of the qualitative studies (appendix 3) invited participants to take part if at the time of the recruitment were or recently recovered from ‘cold symptoms’. This may have not encouraged individuals with other RTI to participate; however, the participants mentioned a range of other symptoms at the interviews including fever, ear ache, ongoing sore throat and bronchitis.

8.3.3 The development and the presentation of the intervention

There were three issues related to the development of the intervention materials and these concerned: a) the tailoring of the information, b) health literacy and c) the evidence-based medical advice of the materials.

The tailoring focused on the information regarding the diagnosis of the symptoms and the subsequent advice on what to do; both the diagnosis and the advice were tailored based on the answers the participants had given earlier to the screening section about their symptoms. In the remaining sections, e.g. frequently asked questions and additional information for other symptoms, individuals were asked to read through the headings or short sections of information before deciding if they wanted to read them in detail or not. Participants later commented about having too much information to go through suggesting that it may be more engaging if they are given the choice whether to see more tailored information or able to choose for themselves on what they want to see i.e. system-tailored or user-tailored (Yardley *et al.*, 2010b; Sundar and Marathe 2010).

The second issue regarding the development of the intervention was related to health literacy; this refers to the ability to seek, interpret, and use health information to make informed choices about health (Jordan *et al.*, 2011). There is accumulating evidence of the importance of health literacy in accessing and using health information as well as evidence of problems associated with low health literacy such as poor ability to take medication appropriately, difficulty in understanding patient information and overall poorer health status particularly among elderly, ethnic minorities and of lower socio-economic status (Nielsen-Bohlman *et al.*, 2004). In addition, low health literacy is linked to low internet

access and perceived self-efficacy barriers than participants with high health literacy (Shieh *et al.*, 2009). The current study did not assess the level of health literacy among the participants and whether the materials had to be adjusted accordingly to accommodate possible differences in health literacy; this could potentially exclude some individuals from accessing and using the information (Nijland *et al.*, 2008). There are increasing calls to develop interventions on sound methodological designs to increase health literacy although its conceptualisation and measurement still appears to be a contested issue (Jordan *et al.*, 2011).

The third issue about the development of the materials concerned the medical advice given for alleviating symptoms which was drawn from evidence-based resources; however this was not possible for all the advice e.g. advice on some of the remedies for the various cough-types. When non-evidenced based information was presented, this was stated that such information was based on what other people do e.g. steam inhalation. However, this could be clarified better particularly when there is no evidence comparing effectiveness of advice based on cough-type.

Regarding the presentation of the materials, as they were not online, each page was shown by the researcher manually in the order it would have been presented on the website.

However, this process did not provide the participants with the same degree of freedom to click whenever they wanted as they might have done with a conventional website.

Although the researcher encouraged and reminded participants throughout the interview that they could see any page again, the control and the flow of the intervention materials was mostly with the researcher. This was possibly both advantageous and disadvantageous. As an advantage, the researcher was able to elicit feedback for all the pages rather than the participant possibly skipping some pages and giving little or no feedback. As a disadvantage, this process did not reflect a real-life interaction with the intervention and participants might have felt 'forced' to go through pages they might not have done so online. The use of think-aloud techniques is often used in laboratory settings with a real website videoing what people see so they do not have to read it aloud (Elling *et al.*, 2012).

Having participants to read aloud what they see and think may have affected their experience with the intervention particularly in terms of time taken and feeling awkward than it would have been in real life where individuals can quickly go through the information they want or not to see. Street *et al.* (2013) argued that interactivity and users' control of the content have significant contribution for delivering health care messages and

how people respond to them. Subsequently, this limitation of the current intervention could have influenced the degree of obtaining an accurate reflection of a real-life interaction with the web materials.

8.3.4 Eliciting and analysis of the qualitative data

Some degree of social desirability bias might have been created in eliciting feedback about the materials in the qualitative study in chapter 5. Some participants were giving short positive comments about the materials without elaborating further, particularly during the first pages of the first few interviews. The researcher noted this issue when reviewing the transcripts thus the importance of getting peoples' feedback in terms of what they liked and did not find helpful with the intervention was emphasised in the subsequent interviews. This strategy was helpful as both the frequency and the length of both positive and negative comments increased. In the analysis of the data about the experiences of being unwell, presented in chapter 6, there was support for the two theoretical models that have been tentatively suggested by the existing literature i.e. Social Cognitive theory and Illness perceptions. However, Glaser (1992) argued that one should have no strong preconceptions when approaching a problem thus the analysis might have been influenced by the existing literature and biasing the interpretation and the conceptualisation of the data. Nonetheless, the constructivism approach adopted by the study enabled to both acknowledge that the conception of the data codes may have been influenced by the theoretical ideas of the existing literature but also enabled, during the subsequent analytical process, to define and label the emerging themes as grounded in the data which in turn led to the overall conceptualisation process of the factors influencing people's decision to seek professional help for their cold and flu symptoms.

8.3.5 The design of the survey

The survey study in chapter 7 had a cross-sectional design as data were collected and analysed at a single time point. In this respect, the predictor variables associated with the outcome of consultation visit cannot be interpreted as causal factors or infer any directional causality. In addition, the newly developed scales were not validated prior this study; although self-efficacy and outcome expectation sub-scales were based on widely-used guidelines from the Social Cognitive theory, further work is needed to determine their validity, acceptability and comprehensibility. Nonetheless, there were very few missing data which can be used as an indication that participants did not have difficulties in answering the questions.

8.4 Implications and Recommendations

Considering the aforementioned limitations, the following section discusses the arising implications from the studies of this research. It must be noted that since the completion of this research programme and the development of the intervention, the current work has been developed further by my supervisors and other research colleagues. Therefore some of the implications are discussed in the framework of the subsequent studies done.

The systematic review in this thesis made a significant contribution in bringing together and examining interventions that addressed minor ailments including ARTI for both adults and parents of young children. A subsequent systematic review examined consultations and antibiotic use for ARTI focusing on children only (Andrews *et al.*, 2012) and consequently it excluded large trials that included both adults and parents on the behalf of their children (e.g. Heaney *et al.*, 2001). Thus, the current systematic review provided a wider picture of the existing research and synthesized information from both adults and adults caring for their children towards determining the effectiveness of interventions targeting self-care and consultation visits. Another advantage of this systematic review over Andrews *et al.* (2012) was the investigation of the underlying rationale and the theoretical basis, if any, of the included trials. This was beneficial for the subsequent development of the intervention, reported in chapter 4, in order to gain a better understanding of the underlying framework(s) used in the existing trials and assess the possible links to outcomes such as consultation and self-management behaviour. Although the majority of the trials, particularly the early ones, did not explicitly report using any framework to guide the development of their intervention, the underlying assumption was that provision of information would influence behaviour, also labelled as 'information deficit model' (Heaney *et al.*, 2001). However, and as already raised in literature on chronic conditions (Murray *et al.*, 2005), provision of information alone is not adequate to significantly influence behavioural outcomes and additional components need to be considered, such as influence from the social network as observed in the qualitative study on participants' experiences being unwell, reported in chapter 6.

The implications from the findings of the qualitative study regarding the feedback on the intervention, reported in chapter 5, are that receiving tailored information and advice is appealing and helpful to the participants, and long pieces of text are viewed as

overwhelming and excessive to process. These findings were particularly important considering the skewed demographics of the sample i.e. having some expertise in using the internet, at least with secondary education level, and of younger age. Individuals of older age, lower educational level or with cognitive impairment may find more difficult to process such information and properly designed interventions need to account such factors (Rotondi *et al.*, 2007). Building on this evidence, a subsequent modification of the intervention (Yardley *et al.*, 2010b) addressed the above issues by providing more tailored advice to the users (i.e. system-tailored information) as well as allowing them more control on what they wanted to read (i.e. user-tailored), and including individuals with more varied demographics. Findings suggested that regardless of educational level, the information was positively accepted and highlighted the importance of considering not just the demographic characteristics of the sample but also the level of control they would like to have over the information they want to view i.e. if selected by the system mimicking a traditional consultation style of questions and answers or selected by them. Further work is needed to identify the level of control users would like to have in an online intervention, if there are conditions that may be linked to such preference e.g. in case of recurring symptoms, existing co-morbidity of a chronic condition, and the status of the provider of the intervention e.g. recognisable and trustworthy source.

The findings from the qualitative study concerning participants' experiences of being unwell, reported in chapter 6, indicated a hypothesis on whether younger people may be more likely to seek professional help when unwell with ARTI as they have little experience of the self-management of their symptoms. Another arising question was whether younger people living at home or with others, thus being in a social network that can help them with self-management, were less likely to consult than young people living on their own or in a new environment such as university. However, the sample demographics did not allow for adequate comparison to pursue this further. Based on the hypothesis of younger people may be more likely to consult, subsequent work (Yardley *et al.*, 2010a) via an exploratory RCT targeting university students indicated that young people below 25 expressed less intention to consult after going through an online intervention for self-management of ARTI. This finding provided evidence to the earlier hypothesis suggesting that younger people may benefit from self-management advice, however more work is required to assess actual behaviour.

In both qualitative studies, participants commented that one of the factors that initiated their contact with a health care professional was the duration of their symptoms as it was longer than they expected thus they were concerned if it was something more serious. In addition, they commented that the stated duration in the intervention materials was too long for them to wait before consulting a health care professional. These findings map on the construct 'duration of symptoms' of the Common Sense Model (Leventhal *et al.*, 2003) where the majority of research using the model focuses on chronic conditions (e.g. McAndrew *et al.*, 2008). Thus these findings provide evidence supporting the use of the constructs of the specific model in acute conditions as well.

From the current research, in terms of policy and practice, it is recommended to consider the development of online interventions that would provide educational information on what people can do when they are unwell, or care for someone else, while considering the risks and benefits of various treatments including antibiotics and seeking professional help. In addition, such interventions could incorporate tailored information and advice matched to the needs and preferences of the users to increase relevance and persuasiveness e.g. how much information to view, what to read, the possibility to contact a clinician if further help was required while acknowledging the importance of past experiences in users decision-making as well as the influence of their social network. The mediums via which online interventions can be accessed become cheaper and faster e.g. use of smart phones and increasing availability of wireless internet thus increasing the number of people that could potentially engage with the intervention.

8.5 Suggestions

Further research into the usability and acceptability of online interventions could include a more varied sample of participants, for both quantitative and qualitative studies. Building on the findings from the current research, there was evidence that the intervention was well-received by the participants, however they were predominantly young and likely to have more positive attitudes towards web-based advice than the general population particularly older, and individuals with less educational qualifications (Rogers and Mead, 2004). In addition, as people get older some may feel they become more experienced in assessing whether their symptoms suggest something serious and how to self-care. This is based on evidence arising from the qualitative study on peoples' experiences of being

unwell where they appear confident they can recognise a minor ailment and how to self-manage. In addition, individuals with other concurrent conditions may place different emphasis on screening of symptoms as these may mimic symptoms of their ongoing condition and have other concerns about treatment in case they are already taking medication. Thus, recruitment for future research need to include a more representative population sample. Furthermore, more research could investigate the factors associated with cultural values in self-management and consultation for minor ailments of ethnic minority groups and incorporate these in the online intervention, as previous work has shown in interventions of printed information for ethnic minorities living in deprived areas (Plass *et al.*, 2005).

The current research presented the development of the prototype of a theory-based intervention intended to be web-based. As already noted in the limitations, health literacy was not addressed in the intervention thus further development of an online version needs to account this aspect particularly ehealth literacy. This is a term which builds upon health literacy and further considers the role of communication technology in health information and the ability to access, search, appraise and use such information to address a particular health problem (Norman and Skinner 2006). Although there is no clear evidence about the methods or techniques to enhance online health literacy (Car *et al.*, 2011) it is vital to consider this dimension in future development of the intervention as a possible barrier to use the online health information. One possible avenue for research is identifying whether there are particular groups of users where ehealth literacy is particularly low e.g. people with low socio-economic status and which factors may be more important in facilitating ehealth literacy.

Various theoretical constructs were observed in the studies of this research linked to self-management and the decision to consult. Future research could investigate the usefulness of theoretical tailoring of factors linked to behavioural outcomes for minor ailments. In a meta-analysis of 57 studies of tailored print interventions, Noar *et al.* (2007) showed that studies tailoring theoretical concepts had larger effect sizes than those without such tailoring and tailoring of psychosocial constructs such as self-efficacy enhanced the effectiveness of the intervention. In the current research, there was no tailoring of psychosocial factors and future development of the intervention could incorporate such aspect. This could be achieved by prior-assessment of factors found to be related to the end outcome as observed in the survey study of this research, reported in chapter 7, e.g. belief

that symptoms can resolve on their own, or beliefs about the duration of symptoms, a construct of the Common Sense Model, observed in the qualitative study about peoples' experiences of being unwell, reported in chapter 6.

8.6 Conclusion

This thesis presented the development process of a theory-based intervention designed to support decision-making of the general adult population on whether to seek professional help or self-care for five acute respiratory tract infections. This chapter summarised the findings of the empirical studies, their limitations, and the implications of the results. Overall, the qualitative study on participants' feedback indicated the theoretical and technical components of the intervention including the usefulness and the acceptability of the intervention with various suggestions about the content and the format of the information. Furthermore, the findings from the qualitative study of participants' experiences being unwell and their subsequent coping mapped onto theoretical constructs that were only tentatively suggested in the literature and provided further evidence for their inclusion in the intervention. From the quantitative study, there was evidence that the decision to consult was linked to beliefs that symptoms can resolve on their own and seeking help from the pharmacist prior seeing the GP.

The findings from the empirical studies contributed further into the development of the intervention as a new resource to help individuals decide whether to seek professional help or self-care for their symptoms. Further work for the online version of the intervention, including tailoring of theoretical factors and including more representative sample, can enhance its validity and effectiveness.

Appendix 1 Characteristics of the included studies-systematic review

Study	Alder et al 2005
Methods	<p>Country: USA</p> <p>Objective: To assess parents' self-reported ability to communicate with their child's GP, their antibiotic use and receipt of antibiotic prescription for minor ailments (ear pain, sore throat, cough, congestion and/or fever)</p> <p>Setting: Primary care clinics</p> <p>4 arm RCT</p> <p>Power calculation: No</p>
Participants	<p>Parents of children aged 1 to 10 visiting two primary care clinics were invited to participate. They were randomized to one of four conditions (total number of participants 80).</p> <p>Females (% of all parents-participants): 82.5%</p>
Interventions	<p>Control = Information on nutrition for children</p> <p>Intervention= 3 groups: 1) practice to encourage ability to communicate with the GP, 2) pamphlet and fact sheet on antibiotic prescription, 3) combination of intervention 1 and 2. Intervention implemented during the consultation</p>
Outcomes	<p>Questionnaire assessing self-efficacy to communicate and antibiotic prescription. Assessed on the same day the intervention was administered (via a questionnaire)</p>
Study	Anderson et al 1980 (nested study in the trial by Morrell et al 1980)
Methods	<p>Country: UK</p> <p>Objective: To measure the mother's knowledge of the management of 6 common symptoms of young and older children (sore throat, diarrhoea & vomiting, fever, cough, minor trauma, runny nose)</p> <p>Setting: Not clear</p> <p>2 arm RCT</p> <p>Power calculation: No</p>
Participants	<p>A random sample from the initial group of families (n=284) participating in the trial by Morrell et al (1980)</p> <p>Age of oldest preschool child (mean): 3.6 (intervention group); females (%): not reported</p>

Appendix 1 (*continued*)

Interventions	<p>Control = Not stated what they received</p> <p>Intervention= Received a booklet with information on 6 common symptoms</p> <p>Administration of a questionnaire:</p> <p>Both control (n=47 families) and intervention (n=51 families) groups were interviewed to elicit what action the parent would take if the illnesses described in the booklet occurred in himself/herself or in oldest preschool child</p>
Outcomes	<p>Parent's knowledge of the management of the 6 symptoms</p> <p>Assessed at 3 months after end of the study (study duration 12 months)</p>

Study **Everitt et al 2006**

Methods	<p>Country: UK</p> <p>Objective: To assess different management strategies for acute eye conjunctivitis</p> <p>Setting: General Practice</p> <p>2 arm RCT</p> <p>Power calculation: Yes</p>
Participants	<p>Individuals presenting with acute eye conjunctivitis at 30 general practices. Age (mean): 27.5; females (%): 43.3</p>
Interventions	<p>Control = No leaflet (n=119)</p> <p>Intervention= Received a leaflet on the self management and clinical course of conjunctivitis (n=122)</p>
Outcomes	<p>Duration of symptoms</p> <p>Symptom severity</p> <p>Satisfaction with information received</p> <p>Belief in the effectiveness of antibiotics for eye infections</p> <p>Data collected from patient diaries completed for 14 days after consultation.</p>

Study **Francis et al 2009**

Methods	<p>Country: UK</p> <p>Objective: To assess the effect of an interactive booklet on respiratory tract infections (RTI) in children on re-consultations and antibiotic prescribing</p> <p>Setting: General Practice</p> <p>2 arm CRCT</p>
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Appendix 1 (*continued*)

	Power calculation: Yes
Participants	Individuals consulting with RTI (from 6 months old to 14 years) at 61 participating general practices. Age (mean): 5.2 ; females (%): 54.7 for intervention; 46.5 for control
Interventions	Control = No leaflet (n=284 parents) Intervention= Clinicians were trained online in the use of an eight page booklet to be used in the consultation and then given to the participants as a take home resource (n=274 parents).
Outcomes	Re-consultations (parents' report) Intention to re-consult Antibiotic prescription Antibiotic use Perception of information usefulness Parental satisfaction with care/index consultation Reassurance and Enablement Data collected from parents 14 days after consultation.

Study Hansen 1990

Methods	Country: Denmark Objective: To assess the effect of an educational booklet on the pattern of illness-behaviour in young families Setting: not clear 2 arm RCT Power calculation: No
Participants	Families with at least one child under 8 yrs registered at one GP practice Age: no information; females: no information Randomised n=100 families and included in the analysis n= 98
Interventions	Control = Received nothing (n=48) Intervention= Received a booklet on symptoms of children (n=50 families) [runny nose, sore throat, cough, vomiting, diarrhoea, fever and minor trauma] Not clear where the intervention was delivered and by whom
Outcomes	Number of self-treatments (self-reported diary)

Appendix 1 (*continued*)

Patient-initiated consultations (GP records)

Anxiety (not clear how it was assessed)

Appropriateness of consultations (GP records)

6 months after distribution of the booklets

Study Hansen 1995

Methods	Country: Denmark Objective: To assess the effect of a health education booklet for families with children Setting: Home 2 arm RCT Power calculation: No
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Participants	Families with at least one child under 8 yrs residents of a particular county in Denmark Age range: not stated; females (%): not stated Randomised n= 3913 families and included in the analysis n= 1891
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Interventions	Control=Received nothing (n=1960) Intervention=Received a booklet containing an index of the most common symptoms in children (n=1953) Booklet sent by post
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Outcomes	Perception of illness threat (Self-reported questionnaire) Use of GPs (Self-reported questionnaire) 6 months after distribution of booklets
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Study Heaney et al 2001

Methods	Country: Scotland Objective: To assess the effect of information booklets on the use of health services and possible differential effects between the booklets
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Appendix 1 (*continued*)

Setting: Homes	
3 arm RCT	
Power calculation: Yes	
Participants	General population over 1yr or parents if selected individual was under 16 registered at the participating primary care practices (n=20) Age: not stated; females (%): not stated Randomised n=4953 and included in the analysis n= 4953
Interventions	Control = No information if received anything (n=1563) Intervention1= Distribution of the 'What Should I Do' booklet (n=1702) range of MA; Intervention 2= Distribution of the 'Health Care' manual (n=1688) range of MAs Booklets sent by post to participants – not clear if endorsed by GP
Outcomes	The effect on overall use of health services – for both booklets together and separately (medical records) The effect on use of particular types of services (GP consultations for MA and out of hours consults) (medical records) All outcomes assessed at 12 months after distribution
Study	Little et al 2001
Methods	Country: UK Objective: To assess the impact of postal information on peoples' confidence about self management and on MI consultation rates Setting: Homes 3 arm RCT Power calculation: Yes
Participants	Adult patients (16+) previously well registered at 6 particular GP practices Age (mean): booklet=37, summary care=37, control=38; females= 51% Randomised n=4002 and included in the analysis n= 2965
Interventions	Control = Received a leaflet with the surgery opening times (n=1267) Intervention1= Received the 'What Should I do' booklet (n=1234) Intervention2= Received a summary card on self-management of certain MI (n= 1263) Leaflets and booklets sent by post – endorsed by GP

Appendix 1 (*continued*)

Outcomes	Consultation rates with the 42 MI listed in the booklet MI attendance among those who attended with respiratory illness in the year before Perceived usefulness of leaflet/booklet Confidence in managing MI Willingness to wait before seeing the doctor All outcomes assessed at 12 months after distribution
Notes	Intervention material: available
Study	Little et al 2005
Methods	Country: UK Objective: To assess the effectiveness of an information leaflet and 3 antibiotic prescribing strategies for acute LRTi on symptoms, beliefs and behaviour Setting: Primary care practices 2x3 RCT Power calculation: Yes
Participants	Patients (3 years old +) with uncomplicated acute illness presented in primary care with cough as the main symptom (37 GPs participating) Age (mean): intervention =39; control= 38 ; females (%) = not stated Randomised n=807 and included in the analysis n= 640
Interventions	Control = Standard verbal advice and verbal information (n= 402) Intervention= Standard verbal advice and verbal information + leaflet (n=405) Advice given by the GP during consultation visit + leaflet in the envelope with prescribing strategy
Outcomes	Symptom severity (self-report diary) Symptom duration (as above) Satisfaction of patients (self-report questionnaire) Beliefs in antibiotics (self-report questionnaire) Antibiotic use (self-report questionnaire) Re-consultation with cough (medical notes) Complications (medical notes) Diaries were returned 3 weeks after randomisation and notes were reviewed 1 months after

Appendix 1 (*continued*)

Notes	Intervention material: not available
Study	Macfarlane et al 1997
Methods	<p>Country: UK</p> <p>Objective: To assess the impact of a leaflet on respiratory tract symptoms on re-consultations</p> <p>Setting: Primary care practice (76 GPs; number of practices unknown)</p> <p>2 arm RCT</p> <p>Power calculation: Not stated</p>
Participants	<p>Adult patients (16+) previously well presenting with lower respiratory tract infection (LRTi)</p> <p>Age range: 16-89; females (%) = 60</p> <p>Randomised n= 1006 and included in the analysis n=1006</p>
Interventions	<p>Control = Questionnaire (n=501)</p> <p>Intervention= Leaflet and questionnaire (n=505)</p> <p>Questionnaire and leaflet given by the GP during consultation visit</p>
Outcomes	<p>Re-consultation for the same symptoms within one month (GP notes)</p> <p>Assessed 4 weeks after first consultation</p>
Notes	Intervention materials: available
Study	Macfarlane et al 2002
Methods	<p>Country: UK</p> <p>Objective: To assess the impact of a patient information leaflet on the use of antibiotics in patients with acute bronchitis</p> <p>Setting: Primary care practice (3 practices)</p> <p>Nested 2 arm RCT</p> <p>Power calculation: Yes</p>
Participants	<p>Adult patients (16+) previously well presenting with acute bronchitis</p> <p>Age range: 17-84; females (%)= 58.5</p> <p>Randomised n=212 and included in the analysis n=205</p>
Interventions	<p>Control = Received standard verbal advice only (n=106)</p> <p>Intervention=Received standard verbal advice + information leaflet (n=106)</p> <p>Advice and leaflet given by the GP during consultation visit</p>

Appendix 1 (*continued*)

Outcomes	<p>Antibiotic use-assessed 2 weeks after consultation visit (symptom diary + telephone contact)</p> <p>Re-consultation rates for the same symptom-assessed in the next month (not clear how assessed)</p> <p>Assessed at week 1 + 2 after first consultation (antibiotic use) and within first month (re-consultation rates)</p>
Notes	<p>Patients assessed by GPs requiring immediate prescription were not included in the analysis</p> <p>Intervention material: available</p>

Study **Moore et al 2009 (follow-up study from the trial by Little et al 2005)**

Methods	<p>Country: UK</p> <p>Objective: To assess the effectiveness of an information leaflet and 3 antibiotic prescribing strategies for acute LRTI on longer-term reconsultation (1-year follow up)</p> <p>Setting: Primary care practices</p> <p>2x3 RCT</p> <p>Power calculation: Yes</p>
Participants	<p>Patients (3 years old +) with uncomplicated acute illness presented in primary care with cough as the main symptom (37 GPs participating)</p> <p>Age (mean): intervention =39; control= 38 ; females (%) = not stated</p> <p>Randomised n=807 and included in the analysis n= 640</p>
Interventions	<p>Participants randomized to either leaflet or no-leaflet groups, and to one of three prescribing strategies (antibiotics, delayed antibiotic, no antibiotic)</p> <p>Control = Received standard verbal advice and verbal information (n= 402)</p> <p>Intervention= Received standard verbal advice, verbal information and a leaflet (n=405)</p> <p>Advice given by the GP during consultation visit + leaflet in the envelope with one of the three prescribing strategies.</p>
Outcomes	<p>Re-consultation for acute LRTI (medical notes)</p> <p>Prior antibiotic use (medical notes)</p> <p>Symptom severity (self-report diary and telephone interview)</p> <p>Symptom duration (self-report diary and telephone interview)</p>

Appendix 1 (*continued*)

Notes	Intervention material: not available
Study	
	Morrell et al 1980 (from the same trial as Anderson et al 1980)
Methods	<p>Country: UK</p> <p>Objective: To investigate the impact of printed materials about 6 common symptoms of young and older children on consultation rates</p> <p>Setting: Not clear</p> <p>2 arm RCT</p> <p>Power calculation: No</p>
Participants	<p>All families registered at a particular practice with at least one child under 5 years</p> <p>Age: not reported ; females (%): not reported</p> <p>Randomised n=284 families (999 individuals) and included in the analysis n= 954 individuals</p>
Interventions	<p>Control = Not stated what they received (n=478)</p> <p>Intervention= Received a booklet with information on 6 common symptoms [sore throat, diarrhoea & vomiting, fever, cough, minor trauma, runny nose] (n= 521)</p> <p>Endorsed by GP but unclear how the intervention was administered</p>
Outcomes	<p>Patient-initiated consultations for the 6 symptoms of the booklet (medical notes)</p> <p>Patient-initiated consultations for 3 symptoms not in the booklet (medical notes)</p> <p>Self management knowledge (interview of participants)</p> <p>Assessed at 12 months after delivery of intervention</p>
Notes	Intervention material: not available
Study	
	Platts et al 2005
Methods	<p>Country: UK</p> <p>Objective: To investigate the effects of 2 self-care health books on the frequency and duration of consultations and patients' views on their use</p> <p>Setting: Primary care practice</p> <p>3 arm RCT</p>

Appendix 1 (*continued*)

Power calculation: Yes

Participants	Adult patients (16+) registered at a general practice Age (mean/range): not given ; females (%): 72 Randomised n=1967 and included in the analysis n= 1967
Interventions	Control=Received a letter but content unspecified (n=648) Intervention1= Received the Healthwise booklet, a self-care index of 180+conditions (n=660) Intervention2= Received the NHS Direct Health-care guide with 128 index pages (n=659) Interventions given during consultation by GP and endorsed by the practice
Outcomes	Use of allocated books (questionnaire) Perceptions of allocated books e.g. easy to understand (questionnaire) Consultation rates (medical notes) Duration of consultation visits (medical notes) Use of NHS direct telephone line (NHS direct data) Questionnaires assessed at 3 and 12 months after enrolment and consultation rates at 12 months after enrolment
Notes	Intervention material: available

Study Rasmussen 1989

Methods	Country: Sweden Objective: To evaluate mothers' benefit (knowledge) of a self-care booklet and a self-care educational session. Setting: Child health centre 2 arm RCT Power calculation: Not stated
Participants	Mothers of children 6-12 months of age Age (mean/range): not given Randomised n=572 and included in the analysis n= 426
Interventions	Control=Self-care booklet via post regarding how to address childhood illnesses (n=240)

Appendix 1 (*continued*)

Intervention = Received the self-care booklet + a self-care educational session where mothers discussed the self-care booklet and read vignettes (N=332)	
Outcomes	Appropriateness of health-care use (in hypothetical scenarios from vignettes). Structured interviews 2 months after the interventions
Notes	Intervention material: described but not available
Study Taylor et al 2005 (from the same trial as Taylor et al 2003)	
Methods	Country: USA Objective: To assess the effectiveness of educational materials aimed at parents leads to fewer antibiotic prescriptions for their children Setting: Primary care practice (8 practices – 7 private and 1 inner-city clinic) 2 arm RCT Power calculation: No
Participants	Parents of children younger than 24months seen at the practice for any reason Age (mean): intervention=8.8months, control=8.2; females (%):not stated Randomised n= 499 and included in the analysis n= 356
Interventions	Control =Received a pamphlet on prevention of injuries in young children + possible discussion with paediatrician (n= 247) Intervention=Received an antibiotic educational booklet and shown a videotape featuring one of the practice physicians discussing the topics addressed in the booklet + possible discussion with paediatrician (n=252) Materials given at the practice (baseline) and then posted to participants [6weeks and 6 months after] (not clear if endorsed by GP)
Outcomes	Number of diagnoses of otitis media and sinusitis per child Number of visits per child for which antibiotics (oral + intramuscular) were prescribed for a diagnosis of otitis media Number of visits per child for which antibiotics were prescribed for a diagnosis of otitis media and/or sinusitis Total number of antibiotics prescribed per child Total number of visits per patient Number of visits for URI symptoms per child Number of visits for URI Records assessed 12 months after study enrolment

Appendix 1 (*continued*)

Notes	Unclear how possible effectiveness of intervention be attributed to booklet and video separately Intervention material: not available
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Study **Taylor et al 2003**

Methods	Country: USA Objective: To assess the effectiveness of educational materials in improving the attitudes of parents of young children about the judicious use of antibiotics Setting: Primary care practice (8 practices – 7 private + 1 inner-city clinic) 2 arm RCT Power calculation: No
Participants	Parents of children younger than 24months seen at the practice for any reason Age (mean): intervention=8.8months, control=8.2; females (%): not stated Randomised n= 499 and included in the analysis n= 356
Interventions	Control =Received a pamphlet on prevention of injuries in young children + possible discussion with paediatrician (n= 247) Intervention=Received an antibiotic educational booklet + shown a videotape featuring one of the practice physicians discussing the topics addressed in the booklet + possible discussion with paediatrician (n=252) Materials given at the practice (baseline) and then posted to participants [6weeks and 6 months after] (not clear if endorsed by GP)
Outcomes	Attitudes for antibiotic use (self-report questionnaire) Attitudes for injury prevention (self-report questionnaire) Baseline and 6 weeks after study enrolment
Notes	Unclear how possible effectiveness of intervention be attributed to booklet and video separately Intervention material: not available

Study **Terry and Pheley 1993**

Methods	Country: USA Objective: To assess the effects of a brochures-based education campaign on the
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Appendix 1 (*continued*)

	use of services and costs of care
	Setting: Home
	2 arm RCT
	Power calculation: No
Participants	Patients (adults and children) enrolled at a health maintenance organisation Age (mean) intervention=29 control=25; females (%): not stated Randomised n= 14917 and included in the analysis n= 14917
Interventions	Control = Received nothing (n=7439) Intervention=Received a series of brochures each on a different area (cold, sore throat, headaches, fever, flu, ear aches, back pain) (n=7478) Brochures were posted – sent one each month (over a period of 7months)
Outcomes	Use of clinical services related to content of each brochure (medical notes) Costs of care provision (claims data base) Utilization was measured for each month over 12 months; costs were measured overall for the 12 months
Notes	Intervention material: not available

Study **Thomson et al 2002 (from the same trial as Thomson et al 1999)**

Methods	Country: Scotland Objective: To investigate the attitudes to and extent of use of Baby Check among the mothers who received the booklet (by means of a questionnaire) Setting: At home 2 arm RCT Power calculation: Yes
Participants	Mothers of all new-born babies born at the participating practices (13 practices) Age (mean): intervention=29, control=28.6 Randomised n=997 and included in the analysis n= 935
Interventions	Control =Received an accident prevention leaflet by post (n=500) Intervention=Received an accident prevention leaflet + Baby Check by post (scoring system of 19 symptoms) (n=497) Intervention delivered by post accompanied with a letter from the practice
Outcomes	Attitudes to reading Baby Check (e.g. if helpful, gives wrong advice,

Appendix 1 (*continued*)

reassurance, difficult to understand)

Using Baby Check (e.g. trusting the scores and advice, anxious, difficult to use)

Assessed 6 months after intervention

Notes Intervention material: not available

Study Thomson et al 1999

Methods Country: Scotland

 Objective: To evaluate the effect of printed materials (Baby Check) on parent's use of health services for their baby in first 6 months of life

 Setting: At home

 2 arm RCT

 Power calculation: Yes

Participants Mothers of all new-born babies born at the participating practices (13 practices)

 Age (mean): intervention=29, control=28.6

 Randomised n=997 and included in the analysis n= 935

Interventions Control =Received an accident prevention leaflet (n=500)

 Intervention=Received an accident prevention leaflet + Baby Check (scoring system of 19 symptoms) (n=497)

 Intervention delivered by post accompanied with a letter from the practice

Outcomes Consultation rates (medical notes)

 Characteristics of consultation: type of diagnosis, outcome of consultation e.g. advice, referral or antibiotic prescription (medical notes)

 Assessed 6 months after intervention

Notes Intervention material: not available

Study Usherwood 1991

Methods Country: Scotland

 Objective: To evaluate a booklet to provide advice for parents on the home management of illness in their children

 Setting: Home (one practice)

 2 arm RCT

 Power calculation: No

Appendix 1 (*continued*)

Participants	Families with at least one child 2-11yrs registered at one particular practice Age (mean): intervention:31.1 (mothers), control:31.3 (mothers) Randomised n=419 households and included in the analysis n=419
Interventions	Control =Received nothing (n=209) Intervention=Postal distribution of booklet on information for 5 symptoms [cough, fever, sore throat, diarrhoea and vomiting] (n=210) Sent by post but unclear if endorsed by GP
Outcomes	Frequency of parent-initiated first consultation (generally), for booklet symptoms and for non-booklet symptom (ear pain) - (from medical notes) Personal usefulness, usefulness for other families, impact on future action – (self-report questionnaire) Assessed the initial contact within 12 months and questionnaire completed 2 weeks after the end of the 12-month intervention
Notes	Intervention material: not available

Study **Vickery et al 1983**

Methods	Country: USA Objective: To assess the impact of a self-care program (variety of conditions for both adults and children) on health service use Setting: Home 4 arm RCT Power calculation: No
Participants	Adult patients enrolled at a health maintenance organisation Age range: no information; females: no information Randomised n=2833 and included in the analysis n= 1339
Interventions	Control = Received nothing (n=306) Intervention1=Received a range of written materials + telephone information service + individual support counselling (n=329); Intervention2=Received a range of written materials + telephone service (n=359); Intervention3=Received a range of written materials only (n=345) Written materials were posted; the telephone information and the individual counselling was done with a project nurse

Appendix 1 (*continued*)

Outcomes	Total ambulatory care use (medical notes) Hospital use (medical notes) Office visit costs-cost saving (estimation) Minor illness related visits (medical notes) Telephone information service use (researchers' notes) Outcomes were assessed 12 months after intervention
Notes	Intervention material: not available

Appendix 2 Characteristics of excluded studies – systematic review

Andersson et al.(2003)	RCT: Intervention – included web-based material, email and telephone contact vs. control group which included web-based material and email contact
Bauchner et al.(2001)	RCT: Intervention- includes video and brochure given to parents on the judicious use of antibiotics for children in general without specifying any minor acute conditions
Hibbard et al.(2001)	Quasi experimental design: Intervention – included a range of modes to deliver information including health manual, website, telephone advice, workshops vs. control unclear what was received
Huang et al.(2007)	Cluster-randomized trial: Intervention included mailed newsletters regarding antibiotic use – focuses on knowledge regarding antibiotic prescription only
Little et al.(2001a)	RCT: Intervention- no use of health education material; focuses on timing of antibiotic prescription only
Mainous et al.(2000)	RCT: Intervention- the participants are health care professionals
Moore et al.(1980)	RCT: Intervention-included use of booklet and voluntary educational session vs. control provided with nothing
Plass et al.(2004)	Pre-test-post-test design
Reis and Wrestler (1994)	Survey
Roberts et al.(1983)	RCT: Intervention-included use of booklet and educational session vs. control provided with nothing
Robbins et al. (2003)	RCT: Intervention – included home visit to discuss parents' concerns and provide advice and printed information vs. control provided with usual care i.e. no printed information and no verbal educational session
Rutten et al.(1991)	Randomisation of 8 practices: divided in 4 pairs and practices of each pair were allocated into 2 arms; leaflet discussed with a HCP
Rutten et al.(1993)	Same study as Rutten et al 1991 – same design

Appendix 2 (*continued*)

Samore et al.(2005)	Cluster-randomized trial: Intervention – multimodal delivery of information to the community e.g. educational presentations, self-care guide for parents and clinical decision support for GPs vs. comparison group provided with the multimodal delivery of information to the community
Schnellinger et al. (2010)	RCT: Intervention - 2 groups which received a pamphlet and seen a video respectively on proper antibiotic use. Unclear if they referred to a specific group of illnesses such as RTI of minor ailments or antibiotic use in general
Spiro et al.(2006)	RCT: Intervention – parents given both verbal and written instructions for their ‘wait and see’ prescription vs. Control: given immediate prescription and written and verbal instructions
Sustersic et al. (2012)	RCT: Intervention – information leaflet given during the GP consultation followed by discussion vs. control unclear what they received
Pshetizky et al.(2003)	RCT: Intervention – verbal education on acute otitis media together a prescription to collect if symptoms not getting better vs. control getting a prescription only
Trepka et al.(2001)	RCT: Intervention-included distribution of written materials and educational presentations vs. control provided with nothing
Welschen et al.(2004)	RCT: Intervention – included multiple interventions i.e. group education + leaflets vs. control provided with nothing
Wright et al. (2005)	RCT: Intervention-included written material, verbal advice and educational sessions vs. control group which included written material and verbal advice

Appendix 3 Qualitative study - Recruitment advertisement

Have you suffered from a cold in the last 6-9 months?

If so, we would like to talk to you!

My name is Panayiota Andreou and as part of my PhD work I am interested in hearing people's experiences having a cold: how it affected you, what did you do, how long it took to clear out. This information will help us understand better how people respond to such common symptoms, what they do about them and where they get their information from.

We would also like to know about what you think of a new interactive information site which aims to help people decide how to best deal with their symptoms on time, if they need to see their doctor and if there is anything else they can do to help their body recover.

This will involve a one-to-one interview that will be tape-recorded and will last approximately one hour. All participants travelling costs are reimbursed. At the end you will receive a £5 thank you token.

If you are over 16 and your cold lasted no more than 6 weeks then we would like to hear from you. If you are interested or would like to know more about this study please contact me at my office number (023) 80231047 or email pa1@soton.ac.uk . Thank you.

**Study about Cold
Panayiota Andreou
pa1@soton.ac.uk
Tel. 023 80231047**

**Study about Cold
Panayiota Andreou
pa1@soton.ac.uk
Tel. 023 80231047**

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Tel. 023 80231047**

Appendix 4 Qualitative study - Participant Information sheet

Information for Research Participants

What do people do when they have a cold?

Information sheet

I am Panayiota Andreou , a research student at the University of Southampton. I am requesting your participation in a study interested in people's experiences when they have cold or related symptoms, such as cough and sore throat. This will help us understand better how people respond to such common symptoms and what they do about them. We are also interested in what you think of a new interactive information site. This site aims to help people decide how to best deal with their cold symptoms, whether they need to see their doctor immediately and if there is anything they can do to help their body recover. Your opinions will help us to improve our site before making it available to a larger number of people with similar symptoms.

The study will involve an interview which will be in two parts: the first will be about your most recent experience of having a cold. We will ask you questions about the time you had your symptom(s), for example what you did about them and how long they lasted. In the second part, you will see various information sheets on cold symptoms, such as sore throat and runny nose, and I will be asking you questions e.g. if they are easy to read and easy to go through; the whole interview will last for approximately one hour.

You can choose to have this interview at the University of Southampton (Highfield campus), at a community centre (e.g. library), at the researcher's office (Aldermoor Health Centre) or in your home. If you travel to the researcher, your travel costs will be refunded. At the end you will receive a £5 thank you token.

The interview will be tape-recorded and later typed out for the purposes of analysis. The tape will be wiped clean at the end of the study. Personal information will not be given out or viewed by anyone other than the researchers involved in this project. Your name, address and any other personal or identifying information will be removed and results of this study will not include your name or any other identifying characteristics.

Your participation is voluntary and you may withdraw your participation at any time without consequence and without giving a reason. If you decide at the end of the interview that you have changed your mind about taking part, you can withdraw from the study at that point and the tape will be wiped clean and not typed out.

If you have any questions or would like further information about this study, please feel free to contact me, Panayiota Andreou at 023 80231047 and/or pa1@soton.ac.uk

Signature

Date

Name Panayiota Andreou *[researchers name]*

Appendix 5 Qualitative study - Consent form

Statement of Consent

Please complete both copies below

Participant copy:

I _____ have read the above informed consent form.
[participants name]

I understand that I may withdraw my consent and discontinue participation at any time without penalty or loss of benefit to myself. I understand that data collected as part of this research project will be treated confidentially, and that published results of this research project will maintain my confidentiality. In signing this consent letter, I am not waiving my legal claims, rights, or remedies. A copy of this consent letter will be offered to me.

If you agree with the following statements, please put your initials in each box next to each statement

I give consent to participate in the above study.

I give consent to be audio-taped

I understand that the audio files will be destroyed after analysis

I give consent for anonymised quotes from my interview to be used in reports and publications resulting from the study

Signature..... Date

Name
[participant's name]

I understand that if I have questions about my rights as a participant in this research, or if I feel that I have been placed at risk, I can contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: (023) 8059 3995.

I understand that if I have questions or I would like further information about this study, I can contact the researcher, Panayiota Andreou at 023 80231047 and/or pa1@soton.ac.uk

Signature..... Date

Name Panayiota Andreou [researcher's name]

Please keep this part of the Statement of Consent and the Information Sheet for your own reference.

Appendix 5. Qualitative study - Consent form
Statement of Consent

Researcher's copy:

I _____ have read the above informed consent form.
[participant's name]

I understand that I may withdraw my consent and discontinue participation at any time without penalty or loss of benefit to myself. I understand that data collected as part of this research project will be treated confidentially, and that published results of this research project will maintain my confidentiality. In signing this consent letter, I am not waiving my legal claims, rights, or remedies. A copy of this consent letter will be offered to me.

If you agree with the following statements, please put your initials in each box next to each statement

I give consent to participate in the above study.

I give consent to be audio-taped

I understand that the audio files will be destroyed after analysis

I give consent for anonymised quotes from my interview to be used in reports and publications resulting from the study

Signature Date

Name [participants name]

I understand that if I have questions about my rights as a participant in this research, or if I feel that I have been placed at risk, I can contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: (023) 8059 3995.

I understand that if I have questions or I would like further information about this study, I can contact the researcher, Panayiota Andreou at 023 80231047 and/or pa1@soton.ac.uk

Signature Date

Name Panayiota Andreou.. [researcher's name]

Appendix 6 Qualitative study - Debrief form

What do people do when they have a cold?

Debriefing Statement

The aims of this research were first to understand better people's experiences when they have a cold, what they do about their symptoms and if they seek further help if they need to and secondly, to get people's feedback on our new interactive information site.

We expect the results will help us to identify what people consider important when they experience and respond to such symptoms and what ways could help them to deal with them. We also expect that we will be able to improve our information site before making it available to a larger number of people.

Your data will help us to understand more how people cope when they experience cold symptoms, what they do about them and if and why they seek further help. Your feedback will also help us with our information site by improving the content of the materials, for example with more information on the available treatments and whether to see their doctor or not, and how they appear.

Once again results of this study will not include your name or any other identifying characteristics. The research did not use deception.

You may have a copy of this summary if you wish as well as a summary of the research findings once the project is completed.

If you have any further questions please contact me, Panayiota Andreou at (023) 80231047 and/or pa1@soton.ac.uk

Thank you for your participation in this research.

Signature _____ Date _____

Name Panayiota Andreou

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: (023) 8059 3995.

Appendix 7 Qualitative study (think aloud) - Interview Instructions

I would like you to look at the information we put together on some cold symptoms. The information is in various pages which in the future will be online but for now I will be showing them manually.

We would like your thoughts and opinion about the materials and how we can improve them. Any comments, difficulties or problems you may have as you go through them can be used to improve the website.

Imagine you currently have one or more cold symptoms. As I show you the pages, as they would appear online, I would like you to 'think aloud' as you go through the text. By 'think aloud' I mean that I want you to speak out loud the first things and thoughts that come into your mind when you see each page.

I am interested in your thoughts as they come so don't worry about trying to plan what you will say. Please say what you think of the information e.g. what do you think about the questions, about the advice, if you agree or not, if they make sense, if there is something missing.

I will keep reminding you of these points as you go though the pages.

Do you have any questions before we start?

Appendix 8 Intervention Materials for Cough

Section 1

Your personal cold and flu doctor

Do you:

- ✿ Feel under the weather and unwell?
- ✿ Have a cough or a sore throat?
- ✿ Have a stuffy nose or earache?

➤ **Are you not sure if you need to see the doctor?**

- ④ How can you tell if your symptoms are a sign of an illness that may need medical diagnosis and treatment?

➤ **What can you do to feel better?**

- ④ What is the most effective way to treat your own symptoms so they don't interfere with your daily life?

What you are going to see in the following pages:

The following pages are designed to give you expert advice about your symptoms – you can:

- ✿ Get detailed advice on how to cope with your specific problems, including whether you should see your doctor.
- ✿ Find out the answers to all your questions about your symptoms and their treatment.
- ✿ Check if there is anything more you can do to help your body recover.

Our aim is to provide you with all the information you could get from seeing your doctor, but with the advantage that:

- ✿ You don't have to wait for an appointment – you can consult the website doctor any time, as often as you like
- ✿ You don't have to travel to the surgery and sit there waiting for your appointment with other unwell people!
- ✿ You can check for further information if your symptoms change

Who is providing the advice?

A group of doctors, health experts and researchers based at the University of Southampton has put together all the advice and information you will see. The information has been based on scientific and reliable evidence. You can see the references to some of the main sources we used at the end so that you can check these for yourself if you want to.

Section 2

**So that we can give you the right advice,
we need you to tell us about your symptoms:**

You are here:

Main Symptom

1. Which symptom is bothering you most? (please tick one only)	
Cough	<input type="checkbox"/>
Sore throat	<input type="checkbox"/>
Runny or stuffy nose	<input type="checkbox"/>
Earache	<input type="checkbox"/>
Pain or pressure in the face	<input type="checkbox"/>

Section 3

You are here:

Main Symptom

Cough

**Diagnostic
questions**

What is your cough like? Often your cough will be different at different times, so tick all the boxes that apply to your cough	
a) I get a tickle or an itchy feeling in the throat that sets me off coughing	<input type="checkbox"/>
b) I have a deep, hacking cough that feels as if it is coming from my chest	<input type="checkbox"/>
c) I have pain in my chest when I breathe deeply or cough	<input type="checkbox"/>
d) I cough up phlegm from my chest	<input type="checkbox"/>
e) I can hear wheezing and rattling in my chest when I breathe and cough	<input type="checkbox"/>

Section 3

How long have you had your cough for? (please tick one only)	
Less than two weeks	<input type="checkbox"/>
Between 2-4 weeks	<input type="checkbox"/>
More than 4 weeks	<input type="checkbox"/>

Over the <u>last week</u> has your cough got better, worse or stayed much the same? (please tick one only)	
My cough is getting a little better, but too slowly	<input type="checkbox"/>
My cough is not getting better at all	<input type="checkbox"/>
My cough is steadily getting worse	<input type="checkbox"/>

You are here: Main Symptom Cough	Please tick each of the symptoms you may have	Yes	No
	Do you get short of breath when you are inactive <i>or</i> doing very little, <i>or</i> is your breathing getting worse than before?	<input type="checkbox"/>	<input type="checkbox"/>
	Have you had a high fever (a temperature of more than 38.5 °C or 101.3 °F) for at least 3 days?	<input type="checkbox"/>	<input type="checkbox"/>
	Do you have a severe headache, stiff neck and you avoid bright lights even if you have no temperature?	<input type="checkbox"/>	<input type="checkbox"/>

Diagnostic questions	Do you have any of the following conditions? (you may tick more than one)	Yes	No
	Asthma	<input type="checkbox"/>	<input type="checkbox"/>
	Chronic bronchitis	<input type="checkbox"/>	<input type="checkbox"/>
	Emphysema	<input type="checkbox"/>	<input type="checkbox"/>
	Chronic obstructive pulmonary disease (COPD)	<input type="checkbox"/>	<input type="checkbox"/>
	Lung disease	<input type="checkbox"/>	<input type="checkbox"/>
	Heart problems (e.g. angina, heart attack, heart failure)	<input type="checkbox"/>	<input type="checkbox"/>

Section 4

You are here:

Main Symptom
Cough
Diagnostic
questions

**Your personal
diagnosis and
advice**

Your personal diagnosis report

You should go to see your doctor about your cough.

This may be because of any of these signs:

- It has lasted four weeks without getting any better
- It is getting worse after you have already had it for two weeks
- You have had a high temperature (over 38.5 °C or 101.3 °F) for at least 2-3 days
- You are short of breath when inactive or doing very little, or your breathing is getting worse than it used to be
- You have a severe headache, you cannot stand bright lights and have a stiff neck (even if you have no temperature)

These are signs that you need a medical check-up.

Section 4

You are here:

Main Symptom
Cough
Diagnostic
questions

**Your personal
diagnosis and
advice-**

Warning

Your personal diagnosis report

Warning: Because you have

....., you need to be more careful than other people when you have a cough. There are no signs that you need to see the doctor yet, but if your cough or your breathing gets any worse then you should go to see your doctor right away.

Section 4

Your personal diagnosis report

You have selected:

I get a tickle or an itch in the throat that sets me off coughing

These are symptoms of an infection in your throat or upper airways, which makes them over-sensitive. When the airways in your lungs get blocked or irritated, coughing forces the air out of your lungs in an attempt to remove whatever seems to be causing the blockage. This is your body's normal mechanism for cleaning a blockage.

Did you know?

When your throat is irritated you may start to cough even when there is nothing to cough out.

Is it possible my cough may be partly due to an allergy?

Sometimes cough can be caused or made worse by an allergic reaction to a substance, e.g. grass, weed and tree pollens, house mites or dust. Other common symptoms of an allergic reaction are:

- Sneezing
- Coughing
- Blocked or runny nose
- Itchy throat and eyes

Usually they last longer than a common cold (more than 7 days). They may occur at a certain time of the year (such as in the case of hay fever) or all year-around. When the body comes into contact with the substance it is allergic to, it triggers the release of chemicals in the body called histamines which cause these symptoms.

Section 4

Your personal diagnosis report

You have selected:

- I have a deep, hacking cough that feels as if it is coming from my chest and/or
- I have pain in my chest when I breathe deeply or cough

It is quite common to develop a deep chesty cough towards the end of a cold or after a sore throat or flu. Sometimes, when breathing or coughing, you may get pain in the chest.

You can also get a chesty cough after exposure to dust or smoke.

You may find your symptoms get worse at night.

Did you know?

A chesty cough can occur because phlegm may be present in the airways but is not loose enough to be coughed up easily— but your body will still manage to clear this out.

Section 4

You are here:

Main Symptom

Cough

Diagnostic

questions

Your personal diagnosis report

You have selected

- I cough up phlegm from my chest and/or
- I can hear wheezing and rattling in my chest when I breathe and cough

Your body produces mucus or phlegm, which is often green or yellow, as a way to fight infection in the airways. It acts as a barrier to catch all the foreign particles and it helps to clear out the lungs.

Sometimes the mucus makes your breathing wheezy, or produces a rattling sound when you cough. Sometimes it may contain tiny quantities of blood, which is normal.

Did you know?

There is no risk choking from your phlegm when sleeping; this is because your body automatically makes you cough and clear your

Section 5

You are

here:

Main

Symptom

Cough

Diagnostic

questions

- Your personal diagnosis and advice
- When to see the doctor

Do I need to see the doctor for these symptoms?

The symptoms you have at present are not a sign of a serious illness that needs to be seen by the doctor.

There are available treatments that provide relief from these symptoms. You do not need a prescription for these so we have provided detailed advice on the following pages.

Are you still unsure when to see your doctor for your symptoms?



If so, then just click here to see what symptoms mean you should see the doctor

Section 6

You are here:

Main Symptom

Cough

Diagnostic

questions

- Your personal diagnosis and advice

- When to see the doctor

You should go to see your doctor about your cough if:

- It has lasted four weeks without getting any better
- It is getting worse after you have already had it for two weeks
- You also have a high temperature (38.5 °C or 101.3 °F) that has lasted for at least 3 days
- You are also short of breath when inactive or doing very little, or your breathing is getting worse than it used to be.

Section 7

You are here:

Main Symptom

Cough

Diagnostic
questions

- Your personal diagnosis and advice
- When to see the doctor
- **When can I get better?**

When should my cough clear up?

GPs find that the patients they see with a cough report that on average:

- Their cough gets worse for up to 10 days after it starts
- It may remain bad with no sign of improvement for another week
- It then begins to slowly get better over the next 1-2 weeks.

So a cough can easily take 3-4 weeks in total to clear completely and for a small group of people (around 5-10%) this can take up to 6 weeks. There is no medical evidence that having a cough for so long can weaken your lungs or your chest or make you more likely to get a cough again in the future.

Did you know?

Although cough can take a while to go away, the doctor cannot usually do anything to speed this process up.

You may notice that there are times when your symptoms may start to clear, or clear completely, and then come back again after a short while.

This can be because the original infection is taking a bit longer to finally settle, but often it means you have had bad luck and caught a new virus. This may then need a few further weeks to clear.

Section 8

You are here:

Main Symptom

Cough

Diagnostic

questions

- Your personal diagnosis and advice
- When to see the doctor
- **Will seeing the doctor help me get better more quickly?**

Will seeing the doctor help my cough clear up more quickly?

The great majority of cough symptoms are caused by viruses.

Medical evidence shows that there is usually nothing that the doctor can do to speed up your recovery from a virus.

The main things the doctors can do are:

- Make sure there is nothing else more serious going on
- Give you advice on how to get relief from your symptoms
- Help your immune system to fight off the infection

We have provided detailed advice on all these things in the following pages so you do not need to wait for an appointment or a prescription.

Section 9

You are here:

Main Symptom

Cough

Diagnostic

questions

- Your personal diagnosis and advice
- When to see the doctor
- Will seeing the doctor help me get better more quickly?
- **Can antibiotics help with my symptoms?**

Would it help to try antibiotics for my symptoms?

In brief

Medical evidence has shown that antibiotics do not help most people, as symptoms like these are usually caused by viruses and antibiotics do not work against viruses – our immune system is able to fight off the infection.

Antibiotics can reduce cough by 1 day in an illness lasting 3-4 weeks. But they can cause side effects, and the more antibiotics one uses, the more 'resistant' the bugs become and they survive longer.



If you want to find out more about the risks and uses of antibiotics click here

Section 10



More information about the risks and uses of antibiotics

In the past, doctors have prescribed antibiotics thinking that they help. But we know now from a lot of recent medical research that antibiotics do not help the vast majority of people.

There is some research evidence that on average antibiotics may help to reduce the number of days you will have a cough for by 1 day in an illness lasting 3-4 weeks. But studies have shown that not everyone benefits from taking antibiotics as they will not stop you coughing at night, reduce the amount of mucus you cough up, or make you feel better. In fact, antibiotics often cause side effects (such as diarrhoea, rashes, feeling sick) which in rare cases can be very severe (collapse, spasm of the airways).

Antibiotics are only useful for rare causes of coughs (e.g. pneumonia, and some types of infections caused by bacteria). Most common infections of the nose, throat, ears and chest are caused by viruses, and medical experts agree that antibiotics don't work against viruses – our immune system has to fight off the infection.

Why taking antibiotics when not needed can be dangerous

Recent evidence has shown that overusing antibiotics or taking them when not needed (e.g. when our immune system can fight off the infection itself) can be dangerous.

Doctors realise now that the more antibiotics one uses for common symptoms the easier it gets for the bugs to adapt and find ways to survive the antibiotics. They become '**antibiotic resistant**', so that the antibiotics are becoming less effective at fighting infections and in the future they will no longer work for you. So we need to keep producing new kinds of antibiotics that are stronger but this can be very difficult, takes a lot of time and it is very costly.

Antibiotic resistance is becoming a big problem now as some killer diseases are already resistant to several antibiotics.

This is not just a problem for the person who takes antibiotics when they are not needed; it can also affect people who live close by (for example in the wider community) even if they do not take antibiotics themselves. This is because bugs can easily transfer around people, for example by air when sneezing.

There is also research evidence that antibiotics can reduce your ability to fight infections – this happens in two ways: First, they stop your body mounting the full antibody response. Secondly, they kill good bacteria that we all have in our throats, and which are important in the bodies defence against invading bacteria.

Section 11

You are here:

Main Symptom

Cough

Diagnostic
questions

- Your personal diagnosis and advice
- When to see the doctor
- Will seeing the doctor help me get better more quickly?
- Can antibiotics help my symptoms?

- Do my symptoms suggest something else?

Do you think your symptoms might be a sign of something more serious?

 More Info

If Yes, click here to find out more

Some people think their symptoms may be a sign of a serious condition and want to know more about these illnesses.

We have listed the most common conditions people say may cause concern for their cough symptoms. Just click on any of these if you want to find out more.

Bronchitis

Tuberculosis

Tonsillitis

Heart- related problems

Pneumonia

Lung- related problems

Meningitis

Emphysema and chronic bronchitis

Section 11

Information on other conditions

Tonsillitis

This is an infection of the tonsils, which are part of the throat. It often occurs after a cold or flu virus. Tonsillitis occurs as part of pharyngitis (which is the medical term for an inflamed throat), but tonsillitis is **not** a more serious illness than pharyngitis.

The symptoms of tonsillitis are pain when swallowing, fever, headache, and swollen glands. Patches of white pus on your tonsils are common and are a sign of your body's cells attacking the virus (i.e. a good sign that shows your body is fighting the infection well). It is not a serious condition, and as it is commonly caused by viruses, antibiotics have very little effect for most people. People were given antibiotics in the past, but now new medical evidence shows that antibiotics are not very effective for most people (they give about half a day's benefit in an illness lasting 8 days) and they can also lead to side effects such as diarrhoea or a rash.

For advice how to treat symptoms caused by tonsillitis, tick **sore throat** at the end of the cough webpages.

Section 11

Information on other conditions

Bronchitis

This is just the name for an inflammation and irritation of the bronchial tubes in the lungs (at the top of the chest). It often occurs after a cold or flu virus, but can also be caused or made worse by cigarette smoke or air pollution.

The symptoms can include coughing up phlegm, discomfort or tightness in the chest, fatigue, sore throat or runny nose. Green sputum is common and does not mean that the infection is serious, even if it is blood-specked.

Although it is very unpleasant, acute bronchitis (lasting no more than 4 weeks) is not a dangerous condition. As it is mostly caused by viruses, antibiotics have very little effect. People were given antibiotics in the past, but now medical experts agree that the benefits are very slight (on average they reduce the duration of cough by less than 1 day in an illness of 3-4 weeks). Advice on how to treat the symptoms caused by bronchitis can be obtained on the following pages.

Section 11

Information on other conditions

Pneumonia

This is an infection of the smallest air passages in the lungs (alveoli). These passages fill up with pus or mucus, preventing oxygen from reaching the blood. Pneumonia can be caused by a variety of bacteria or viruses and may follow a cold, flu or bronchitis.

Someone with pneumonia is usually very sick and symptoms include: high fever of over 38.5 °C or 101.3 °F lasting for several days; shaking chills; laboured, shallow or rapid breathing (even if you are not coughing or being physically active); fatigue that is much worse than you would expect from a cold; sweating. You can also cough up yellow, green, rust-coloured or bloody sputum, like in all other chest viruses.

If you think you have pneumonia (e.g. if you become much more short of breath, or get recurrent high fevers after the illness seems to have been settling, or if your symptoms get progressively worse) then contact your GP straight away.

Section 11

Information on other conditions

Tuberculosis (TB)

This is a condition caused by bacteria that mainly infect the lungs. People who have been in contact with TB can take up to 2 years to develop active symptoms, and many people who have been in contact with TB never develop active TB themselves. In active TB, symptoms include a persistent cough (over a month), weight loss, fatigue and fever. Phlegm coughed up may be regularly streaked with blood. If you have a cough that has lasted for more than 4 weeks without getting any better you need to contact your GP.

Section 11

Information on other conditions

Meningitis

This is an infection of the membranes that cover the brain and the spinal cord. It can be caused by bacteria or viruses. Viral meningitis is the more common form of the disease but is normally less severe. Bacterial meningitis is a less common but more serious form of the disease.

The typical symptoms are:

- Constant generalised headache
- Confusion
- Drowsiness
- Sensitivity to bright lights, daylight or even the television
- High temperature, although hands and feet may be cold
- Neck stiffness - moving the chin to the chest will be painful at the back of the neck
- Vomiting
- Rapid breathing
- A purple rash that does not fade when you press a glass against it

You may also get other symptoms such as stomach pain, diarrhoea, joint and muscle pains.

If you have these symptoms contact your GP right away.

Section 11

Information on other conditions

Heart-related problems

Symptoms that can be worrying and indicate that you need to see your doctor for possible heart related problems include:

- Crushing chest pain which moves up to your jaw or left arm, making you feel sick and sweaty, that lasts for more than 15 minutes and is not relieved by indigestion remedies
- Pain, pressure, heaviness or numbness behind the breastbone or across the chest when you walk or do other exercise. These can spread to the neck, jaws, shoulders, arms or wrists
- Chest pain and becoming breathless without having any chest infection or cough

In some cases, cold viruses can lead to heart attacks, but in these cases the warning signs are exactly the same as above.

Chest pain due to a cough can occur when your air passages are infected, or because your chest muscles are strained from coughing too much. It may feel like a burning sensation coming from the centre of your chest when you cough, or sometimes it may be a pain at the side when breathing, due to the tenderness of the chest walls. These are not heart-related symptoms.

According to medical experts such pain does not weaken your chest and there is no evidence linking cough or other symptoms (e.g. slight breathlessness, phlegm or nausea) to heart problems.

None of these symptoms pose any strain on the heart or on your chest, even if you have a family history of heart problems. Taking pain killers can help with the pain, and remedies to ease the coughing will reduce the strain on chest muscles – see the following webpages for more advice on how to treat your specific symptoms.

Section 11

Information on other conditions

Lung-related problems

Lung cancer is a very serious cause of coughing, usually due to smoking. Common symptoms include a persistent cough and coughing up blood persistently. Coughing up a little blood when you have had an infection is normal. Other possible symptoms include breathlessness, loss of appetite, fatigue and weight loss. A continuous hoarseness (lasting more than 2 weeks) of the voice is often due to infection but if it continues it can rarely be a sign of cancer. There may also be a persistent pain in the chest or even in one shoulder.

Some of the above symptoms overlap with the symptoms of a common cough but they will last longer. If these symptoms last longer than 4 weeks without starting to improve then you need to see your doctor, especially if you are or have been a smoker.

Section 11

Information on other conditions

Emphysema and chronic bronchitis

Emphysema occurs when the tissue of the lungs is damaged. **Chronic bronchitis** occurs when the bronchial tubes in the lungs (at the top of the chest) become chronically inflamed and results in a cough with phlegm for several months each winter.

In both emphysema and bronchitis, the airways are narrowed and it is difficult to breathe out. It is therefore difficult to walk far or be physically active without getting short of breath. These symptoms persist for months or years.

The most common cause of emphysema and chronic bronchitis is smoking and heavy smokers are most at risk.

If you think your symptoms match these then contact your GP.

Section 12

You are
here:

Main
Symptom
Cough
Diagnostic
questions

Advice on
relieving
your
symptoms

Advice on relieving your cough symptoms

The underlying cause of the cough settles on its own so the available medicines in the market try to control the symptoms.

Did you know?

A review of 17 studies involving almost 3000 people found that, so far, there is no good evidence to show for certain whether taking over-the-counter oral medications can relieve or improve coughs (that last less than 3 weeks). More and better studies need to be done to know for sure.

However, many people do take such medicines and find them helpful for relieving their symptoms.

There is a range of medicines available – soothing ones, suppressants, expectorants and combinations.

Sometimes it helps to identify what type of cough symptoms you have as you use different products depending on your cough type.

We have put together several advice suggestions based on medical evidence and what has been found useful by other people with similar symptoms.

Section 12

You are
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Advice on
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symptoms

* Dry
cough-
things
you can
do
yourself

Advice on relieving your cough symptoms

[If ticked 2a: I get a tickle or an itch in the throat that sets me off coughing]

Tick the advice you want to see (you can tick more than one)

Things you can do yourself

Things you can get from your chemist

Things you can do yourself

- A simple and soothing cough syrup can be made at home by mixing 1 part lemon juice with 2 parts honey; you can use it as often as needed.
- Some people find steam inhalation helpful to ease the symptoms as this opens the airways and thins the mucus. There is some evidence from clinical trials showing this might be helpful for some, although more and larger studies are needed to be sure. You can inhale steam for 5 minutes 3 times a day: fill half of a sturdy 2 pint bowl with boiling water and put a towel over your head and breathe in the hot steam or inhale through a gap in your hands. Taking hot showers or having a humidifier machine in the bedroom may also help.
- A dry atmosphere may worsen the cough, so place a bowl of water in front of the radiator to keep your room moist, and drink plenty of fluids to keep your throat moist.
- If you think your cough might be caused or made worse by an allergic reaction, discovering the source and avoiding that substance is the best treatment. Keeping a record of your symptoms when they occur (e.g. if seasonal or if they persist all year-around) is a good way of identifying what may trigger them.
- Avoid smoking or smoky atmospheres as these irritate the throat even more.

Section 12

You are here:

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Cough
Diagnostic
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Advice on relieving your symptoms

• Deep/Chesty cough-things you can do yourself

Advice on relieving your cough symptoms

[If ticked 2.b/c]

I have a deep, hacking cough that feels as if it is coming from my chest and/or

I have pain in my chest when I breathe deeply or cough

Tick the advice you want to see (you can tick more than one)

Things you can do yourself

Things you can get from your chemist

Things you can do yourself

- Inhalations containing oils like myrrh or eucalyptus can make the phlegm less thick and so easier to cough up. They can also soothe your airways and can be used when taking an expectorant cough mixture.
- Avoid smoky atmospheres and drink plenty of water and fruit juice to flush toxic by-products out of the body as quickly as possible.

Section 12

You are here:

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Advice on relieving your symptoms

• Deep/Chesty cough-things you can ask your chemist

Advice on relieving your cough symptoms

[If ticked 2.b/c]

I have a deep, hacking cough that feels as if it is coming from my chest and/or

I have pain in my chest when I breathe deeply or cough

Things you can ask your chemist

- There are a wide range of cough medicines known as expectorants which help to loosen the phlegm in your airways so you can cough it up and expel it more easily without pain or heavy coughing. Look for products containing ingredients such as ammonium chloride, ipecacuanha or guaifenesin.

Natural remedies

Natural herbs such as angelica, coltsfoot, horehound and thyme may

possibly be helpful. They act as expectorants and can be used to make teas; they are available in different combinations in commercially prepared tea bags or can be taken as tinctures.

Section 12

You are
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Advice on
relieving
your
symptoms

* Wheezing/
Phlegm
from the
chest-
things you
can do
yourself

Advice on relieving your cough symptoms

[If ticked 2.d/e]

I cough up phlegm from my chest and/or

I can hear wheezing and rattling in my chest when I breathe and cough

Tick the advice you want to see (you can tick more than one)

Things you can do yourself

Things you can get from your chemist

Things you can do yourself

- Inhalations containing oils like myrrh or eucalyptus can make the phlegm less thick and so easier to cough up. They can also soothe your airways.
- A simple and soothing cough syrup can be made at home by mixing 1 part lemon juice with 2 parts honey; you can use it as often as needed.
- Drink plenty of water and fruit juice to flush toxic by-products out of the body as quickly as possible and avoid smoky atmospheres.

Section 12

You are here:

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Advice on relieving your symptoms

• Wheezing/P hlegm from the chest- things you can ask your chemist

Advice on relieving your cough symptoms

[If ticked 2.d/e]

I cough up phlegm from my chest and/or

**I can hear wheezing and rattling in my chest when I
breathe and cough**

Things you can ask your chemist

- If there is a lot of phlegm coming out and it keeps you from getting enough rest you can take a preparation containing ingredients such as pseudoephedrine which help dry it up a little. This reduces the total amount of phlegm without stopping the body naturally fighting off the infection.

Section 13

You are here:

Main

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Cough

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Advice on

relieving your
symptoms

**Some people with a cough experience related problems – here
are the most common ones:**

**Do you have any of these problems? (you may tick more than
one)**

Difficulty swallowing?	Yes	No
Feeling weak and tired?	Yes	No
Experiencing slight shortness of breath when you are physically active e.g. walking, housework	Yes	No
Being unable to sleep properly?	Yes	No

Section 13

You are here:

- Main Symptom
- Cough
- Diagnostic questions
- Advice on relieving your symptoms

What you can do if you have difficulty in swallowing

This is usually caused by an inflamed throat and swollen glands in the neck.
The best treatment is paracetamol in proper doses (2 tablets four times a day). If this does not help ask your chemist for lozenges and throat sprays containing local anaesthetics and lozenges containing anti-inflammatory ingredients.

You are here:

- Main Symptom
- Cough
- Other related problems**
 - Difficult to swallow
 - Feeling weak and tired**

What you can do if you feel weak and tired

As your body uses a lot of energy to fight off the cold virus you tend to **feel weak and tired**

- You can take paracetamol or ibuprofen to reduce general pains and aches
- See also **Advice on helping your immune system** later on for further useful suggestions.

You are here:

- Main Symptom

Other related problems

- Difficult to swallow
- Feeling weak and tired
- Problem sleeping
- Slight shortness of breath/wheezing**

What you can do if you have slight shortness of breath

Some people find it helpful to take linctuses containing decongestants (for example pseudoephedrine or phenylpropanolamine). These can also help if the cough is due to too much phlegm in your airways or a blocked nose. However, studies have shown that for a small group of people taking pseudoephedrine can have side effects such as difficulty to sleep.

What you can do if you have problem sleeping	
<p>Persistent coughing can make sleeping quite difficult:</p> <p>There are no good studies which show clearly what helps here, but some people find the following helpful:</p> <ul style="list-style-type: none"> • Steam inhalations can be soothing • People with congested airways find that taking linctuses or tablets containing antihistamines or decongestants can help as they reduce the phlegm that may be making you cough. There are some types of antihistamines that tend to cause drowsiness and others that are less likely to make you sleepy. If you are using any of these for the first time they may cause some drowsiness, so it is useful to take them at bedtime if a cough is keeping you awake at night. • Studies have shown that taking decongestants containing pseudoephedrine can make sleeping difficult so better to avoid products with this ingredient. • If you have a dry and frequent cough, then suppressing the cough can be useful by taking cough linctuses (or tablets) containing dextromethorphan. If your cough seems to be related to an allergic reaction, then an antihistamine can help, but if it is not being helped or you are short of breath or wheezing then you need to see your doctor. <p>Sleep with your head on high pillows to help with the breathing.</p>	

Section 14

You are here:

Main Symptom
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questions
Advice on
relieving your
symptoms
Other related
problems

What else can I do?

What else you can do	
<p>Advice on helping your immune system fight the infection</p>	<p>The advice given earlier can help this natural process but there are also a few other things you could do that can help to reduce the impact of your symptoms on your daily activities.</p>
<p>Look after yourself physically and mentally by:</p> <ul style="list-style-type: none"> ✓ Eating a healthy, balanced diet containing plenty of fruit and vegetables. The body needs a good supply of nutrients to fight off the infection. ✓ Drink plenty of fluids. This is particularly important because the immune system is overworking to fight off the infection and needs lots of fluids to function properly. Also, when people are 	

unwell they usually have reduced appetite and drink less. So there is an increased risk of dehydration (especially if you have a fever).

- ✓ Get extra rest after work; slow down just a little from your usual routine. It is not necessary to stay at home in bed but listen to your body if it needs more rest: maybe this would be a good opportunity to watch TV or a nice film, read a magazine or a book, or just relax.
- ✓ Keep warm but try not to let the room get stuffy, as a little fresh air may help you to feel better.
- ✓ Zinc with vitamin C is commonly used to fight viruses. However, a review of 30 studies, involving a total of 11350 people, showed that taking vitamin C daily can only reduce the duration and severity of colds very slightly (up to 8%). The review has also shown that if you are under great physical or cold stress such as doing marathon or being a skier, then vitamin C can be more effective (reduction up to 50%). We are not sure yet whether start taking vitamin C or increasing the dose at the beginning of a cold might have any useful effect. More research is needed to be sure.
- ✓ Echinacea (a herb) can help reduce the duration of cold infections by 1.4 days, as a recent review of 14 studies has shown. This review, involving over 1600 people, also showed that Echinacea reduces the chance of getting a cold by over 55%. However, it was not clear from those studies how much Echinacea people need to take and for how long before they see the benefits, more research is needed to be sure. You can get Echinacea from most chemists, supermarket pharmacies, or health food shops.
- ✓ Medical evidence shows that stress can significantly reduce the ability of the immune system to fight off infections. Therefore, trying to reduce some of the stress from daily life can have a significant positive impact on your mental and physical health, and help your immune system even further to fight off the infection.

Section 15

You are here:	Do you have any concerns about managing your symptoms overall or about your treatment?
Main Symptom Cough	Frequently Asked Questions
Diagnostic questions	<p>We have put together information about common questions and concerns. Just tick each one you feel applies to you for more advice on those points.</p>
Advice on relieving your symptoms	<p>I'm not sure if I'm doing the right thing</p>
Other related problems	<p>I tried everything and I'm still unwell, I don't think there is anything else I can do</p>
What else can I do?	<p>Only antibiotics work for me when my symptoms are bad - without them I will not get better and may get worse</p>
FAQ	<p>I need to get better quickly and cannot wait for my symptom(s) to take their natural course</p>
	<p>I had a nasty infection in the past and I want to ensure that I won't go through the same thing again</p>
	<p>Isn't it harmful to take something to suppress the cough if coughing helps the body to clear anything that is in the airways?</p>
	<p>Some of the medication suggested contains local anaesthetic, isn't this dangerous?</p>
	<p>Can I take cough mixtures every time I have a cough or are there any harmful effects?</p>
	<p>Having to take cough mixtures or decongestants worries me as I've heard they increase the blood pressure</p>
	<p>I don't really like taking medications, I feel that they are harmful to the body</p>
	<p>I don't want to take medications, I prefer the body to fight off the infection naturally.</p>
	<p>Is it safe to take Paracetamol and Ibuprofen together?</p>
	<p>Is it better to take all-in-one treatments rather individual remedies for each symptom?</p>

Section 15

Frequently Asked Questions on managing my symptoms

I'm not sure if I'm doing the right thing

Although cough and its associated symptoms can make you feel very ill they seldom lead to more serious complications. If you experience symptoms you have never had before or which are worse than you have had in the past then you may worry that these symptoms are a sign of a serious illness. Medical experts agree that you do not need to worry if your cough takes 4-6 weeks to settle.

Section 15

Frequently Asked Questions on managing my symptoms

I tried everything and I'm still unwell, I don't think there is anything else I can do

The various things you are already doing may relieve your symptoms but will not shorten their duration. Cough symptoms can take quite a while, sometimes up to 4-6 weeks, to clear away completely. Prescribed medication such as antibiotics can do very little to speed up recovery. The advice given earlier on, based on your symptoms, will help to reduce the impact of your symptoms and enable you to get on with your everyday life.

Try some of the advice suggestions if you have not already done so, and come back to this website in 2-3 days time to check the progress of your symptoms.

Section 15

Frequently Asked Questions on managing my symptoms

Only antibiotics work for me when my symptoms are bad - without them I will not get better and may get worse

Most common infections and symptoms such as cough are caused by viruses, but antibiotics work only for some infections caused by bacteria. You may have taken antibiotics in the past and felt well soon after that. This is usually due to the natural

course of the symptoms – most people visit their doctor when they have had their symptoms for some time and by then the immune system has started to fight back the viruses on its own, so people are about to get better naturally anyway.

In the past doctors assumed that antibiotics were helpful for cold and flu related symptoms. Now doctors have new medical evidence that has shown that antibiotics don't work for these symptoms, so they tend not to prescribe them any more.

There is no scientific evidence that antibiotics can prevent symptoms from getting worse or protect you from future infections.

There is evidence though that antibiotics can reduce your ability to fight infections – this happens in two ways. Antibiotics stop your body mounting the full antibody response. They also kill good bacteria that we all have in our throats, and which are important in the bodies defence against invading bacteria.

Section 15

***Frequently Asked Questions* on managing my symptoms**

**I need to get better quickly and
cannot wait for my symptom(s) to take their natural course**

As cough symptoms are mostly caused by viruses, recovery even with antibiotics can not be speeded up and may take up to 4-6 weeks although most people only feel unwell for 2-3 weeks. Your immune system is trying to fight off the virus and in doing so your body may need to slow down for a while until it recovers. However, this does not mean that you have to endure the symptoms until they completely settle. The advice given above, based on your symptoms, will help to reduce their impact and help you continue with your everyday life.

Section 15

Frequently Asked Questions on managing my symptoms

**I had a nasty infection in the past and
I want to ensure that I won't go through the same thing again**

Having a bad infection in the past does not necessarily make you more vulnerable to future infections. If you feel you are going through something similar to what you had before then the advice given earlier on can help limit the impact of those symptoms on your body.

There is no scientific evidence suggesting that other treatments such as antibiotics can prevent symptoms from getting worse or protect you from future infections.

Section 15

Frequently Asked Questions on treatment prescriptions

Isn't it harmful to take something to suppress the cough if coughing helps the body to clear anything that is in the airways?

Although coughing is a useful reflex, sometimes the airways get over sensitive even though there is not much to cough up. When this happens, calming or suppressing the cough is helpful. Partly suppressing your cough will not harm the lungs in any way nor delay the recovery – you will still automatically cough up anything that really needs to be cleared out.

Section 15

Frequently Asked Questions on treatment prescriptions

Some of the medication suggested contains local anaesthetic, isn't this dangerous?

The dose is so small that it poses no danger – it is just enough to relieve some of the pain and soothe the throat.

Section 15

Frequently Asked Questions on treatment prescriptions

Can I take cough mixtures every time I have a cough or are there any harmful effects?

There is not enough good evidence to show whether taking cough mixtures every time you have a cough can give you side effects. At the same time though, there is not enough good evidence to show that cough mixtures can help control or reduce your symptoms. Some people find them helpful in soothing their cough but more studies are needed to know for certain.

Section 15

Frequently Asked Questions on treatment prescriptions

Having to take cough mixtures or decongestants worries me as I've heard they increase the blood pressure

There is no good evidence of any harmful effect. If you take such mixtures or decongestants containing pseudoephedrine there might be a small negative effect on blood pressure in the short term. Therefore, if you have high blood pressure that you know is not well controlled but want to take something, you could avoid taking mixtures containing pseudoephedrine. However, more studies need to be done to know for sure.

Section 15

Frequently Asked Questions on treatment prescriptions

**I don't really like taking medications,
I feel that they are harmful to the body**

We have not suggested any medications when there is evidence they are harmful to the body. The treatment advice earlier on gives details when some medications have side effects or when evidence is not yet clear. You don't have to take any medications and we have suggested alternative ways of easing your symptoms.

Section 15

Frequently Asked Questions on treatment prescriptions

**I don't want to take medications,
I prefer the body to fight off the infection naturally**

You don't have to take any medications. The medications are just to ease symptoms and not cure you. We have suggested alternatives ways of easing your symptoms without having to take medications.

Section 15

Frequently Asked Questions on treatment prescriptions

Is it safe to take Paracetamol and Ibuprofen together?

Yes it is safe, and you can take full doses of both. If you have indigestion, past stomach ulcers or asthma then avoid taking Ibuprofen.

Section 15

Frequently Asked Questions on treatment prescriptions

Is it better to take all-in-one treatments or individual remedies for each individual symptom?

Some people find an all-in-one remedy convenient so that all of the symptoms can be treated together. These products usually contain a painkiller to ease aches and pains and lower body temperature, as well as a decongestant to unblock the nose.

Others prefer to treat each symptom individually so you do not have to take all of the ingredients in the all-in-one remedies. There is no research showing these products to be superior to the individual ones.

If you are thinking of choosing an all-in-one remedy, it is important to identify the symptoms that you wish to relieve, e.g. do you need a painkiller?/ is your nose blocked?/do you require a product that will not make you drowsy? Answering these questions will help you decide whether an all-in-one remedy is more appropriate than the use of individual products.

Section 16

Do you have any other symptoms you would like advice about?	
Earache	
Sore throat	
Runny or stuffy nose	
Pain or pressure in the face	

Section 17

Who is providing the advice?

All the information you received today has been put together by health researchers and health care professionals experts in their field at the University of Southampton. The information was based on reliable research evidence drawn from many scientific resources, including these papers:

- 1) Arroll B, Kenealy T(2005) Antibiotics for the common cold and acute purulent rhinitis. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD000247
- 2) De Sutter AIM, Lemiengre M, Campbell H. Antihistamines for the common cold. Cochrane Database of Systematic Reviews 2003, Issue 3. Art. No.: CD001267.
- 3) Del Mar CB et al (2006) Antibiotics for sore throat. Cochrane Database of Systematic Reviews, Issue 4, Art. No. CD000023
- 4) Douglas RM, Hemila H., Chalker E, Treacy B (2007). Vitamin C for preventing and treating the common cold. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD000980
- 5) Fahey et al (1998) Quantitative systematic review of randomised controlled trials comparing antibiotic with placebo for acute cough in adults. British Medical Journal, 316: 906-10.
- 6) Fahey et al (2004) Antibiotics for acute bronchitis. Cochrane Database of Systematic Reviews, Issue 4. Art. No.:CD000245
- 7) Hueston WJ (1997) Antibiotics: neither cost effective nor 'cough' effective. Journal of Family Practice, 44:261-5.
- 8) Shah SA, Sander S, White CM, Rinaldi, M, Coleman CI (2007). Evaluation of Echinacea for the prevention and treatment of common cold: a meta-analysis. The Lancet Infectious Diseases, Vol. 7(7): 473-480.
- 9) Schroeder K, Fahey T (2004) Over-the-counter medications for acute cough in children and adults in ambulatory settings. Cochrane Database of Systematic Reviews, Issue 4. Art. No.: CD001831

Appendix 8 Intervention Materials for Cough

- 10) Singh M (2006) Heated, humidified air for the common cold. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD001728
- 11) Taverner D, Latte J (2007) Nasal decongestants for the common cold. Cochrane Database of Systematic Reviews 2007, Issue 1. Art. No.: CD001953.
- 12) Verkatesum P, Innes JA (1995) Antibiotic resistance in common acute respiratory pathogens. *Thorax*, 50:418-3.
- 13) Verheij T, Hermans J, Kaptein A, Mulder J (1995) Acute bronchitis: course of symptoms and restrictions in patients daily activities. *Scandinavian Journal of Primary Health Care*, 13:8-12

Appendix 9 Intervention Materials for Sore-throat

Section 1

Your personal cold and flu doctor

Do you:

- Feel under the weather and unwell?
- Have a cough or a sore throat?
- Have a stuffy nose or earache?

➤ **Are you not sure if you need to see the doctor?**

- ④ How can you tell if your symptoms are a sign of an illness that may need medical diagnosis and treatment?

➤ **What can you do to feel better?**

- ④ What is the most effective way to treat your own symptoms so they don't interfere with your daily life?

What you are going to see in the following pages:

The following pages are designed to give you expert advice about your symptoms – you can:

- Get detailed advice on how to cope with your specific problems, including whether you should see your doctor.
- Find out the answers to all your questions about your symptoms and their treatment.
- Check if there is anything more you can do to help your body recover.

Our aim is to provide you with all the information you could get from seeing your doctor, but with the advantage that:

- You don't have to wait for an appointment – you can consult the website doctor any time, as often as you like
- You don't have to travel to the surgery and sit there waiting for your appointment with other unwell people!
- You can check for further information if your symptoms change

Who is providing the advice?

A group of doctors, health experts and researchers based at the University of Southampton has put together all the advice and information you will see. The information has been based on scientific and reliable evidence. You can see the references to some of the main sources we used at the end so that you can check these for yourself if you want to.

Section 2

So that we can give you the right advice,
we need you to tell us about your symptoms:

You are here:

Main Symptom

1. Which symptom is bothering you most? (please tick one only)	
Cough	<input type="checkbox"/>
Sore throat	<input checked="" type="checkbox"/>
Runny or stuffy nose	<input type="checkbox"/>
Earache	<input checked="" type="checkbox"/>
Pain or pressure in the face	<input type="checkbox"/>

Section 3

You are here:
Main Symptom

Sore throat

Diagnostic questions

How long have you had your sore throat for? (please tick one only)	
Less than a week	<input type="checkbox"/>
Between 1-2 weeks	<input checked="" type="checkbox"/>
More than 2 weeks	<input type="checkbox"/>

Over the last week has your sore throat got better, worse or stayed much the same? (please tick one only)	
It is getting a little better, but too slowly	<input type="checkbox"/>
It is not getting better at all	<input checked="" type="checkbox"/>
It is steadily getting worse	<input type="checkbox"/>

Section 3

Do you have any difficulty swallowing? (please tick one only)	
A little	<input type="checkbox"/>
Quite a lot	<input type="checkbox"/>
I can't swallow at all	<input type="checkbox"/>

Please tick each of the symptoms you may have	Yes	No
Do you get very wheezy or short of breath?	<input type="checkbox"/>	<input type="checkbox"/>
Have you had a high fever (a temperature of more than 38.5 °C or 101.3 °F) for at least 3 days?	<input type="checkbox"/>	<input type="checkbox"/>
Do you have a severe headache, stiff neck and do you avoid bright lights?	<input type="checkbox"/>	<input type="checkbox"/>

Section 4

You are here:

Main Symptom
Sore throat
Diagnostic
questions

Your
personal
diagnosis
and advice

Your personal diagnosis report	
You are here: Main Symptom Sore throat Diagnostic questions	You should go to see your doctor about this pain
	This may be because of any of these signs: <ul style="list-style-type: none"> • Your sore throat has lasted for more than 2 weeks without any improvement • Your symptoms are getting worse • You can't swallow anything at all • Your breathing is affected (becoming very wheezy or short of breath) • You have had a high temperature (over 38.5°C or 101.3 °F) for more than 3-4 days, • You have a severe headache, you cannot stand bright lights and have a stiff neck <p>These are signs that you need a medical check-up.</p>

Section 4

You are
Main
Symptom
Sore throat
Diagnostic
questions

Your
Personal
Diagnosis
and advice

Your personal diagnosis report

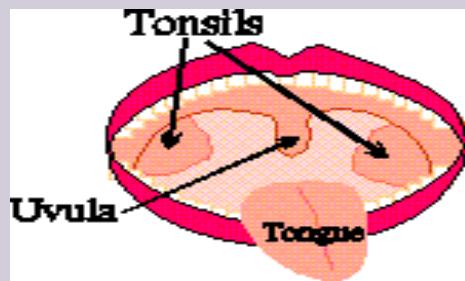
These are symptoms of an infection of the throat or tonsils and as the picture shows, they are two small sacks (or glands) at the back of your throat. Because of the location of the tonsils, when they are infected, you may get a burning feeling on your throat and it can be painful to swallow, especially hot foods and drinks. The voice may sound hoarse and broken and sometimes may disappear for a day or so.

The glands in your neck get larger and you can often see that your tonsils are red, big and sore or have white spots.

These are signs that your body is fighting the infection.

Sore throat is usually one of the first symptoms of a cold or flu.

Sometimes it is accompanied by headache, cough, temperature or fever.



Did you know?

If you have a cough as well you will also need to treat it, as persistent coughing aggravates and inflames the throat.

If you have any of these symptoms as well, you can click to get advice on how to treat them at the end of these webpages on sore throat.

Is it possible my symptoms may be partly due to an allergy?

Sometimes sore throat may be caused or made worse by an allergic reaction to a substance, e.g. grass, weed and tree pollens, house mites or dust. Other common symptoms of an allergic reaction are:

- Sneezing
- Coughing
- Blocked or runny nose
- Itchy throat and eyes

Usually they last longer than a common cold (more than 7 days). They may occur at a certain time of the year (such as in the spring or summer in the case of hay fever) or all year-round. When the body comes into contact with the substance it is allergic to, it triggers the release of chemicals in the body called histamines which cause these symptoms.

Section 5

You are here:

Main Symptom

Sore throat

Diagnostic
questions

- Your personal diagnosis and advice
- **When to see the doctor**

Do I need to see the doctor for these symptoms?

Symptoms of a sore throat, or pharyngitis (the medical term for an infected throat) are caused by viruses and can be quite painful and uncomfortable. However, the symptoms you have at present are not a sign of a serious illness that needs to be seen by the doctor.

There are available treatments that provide relief from these symptoms. You do not need a prescription for such treatments so we have provided detailed advice on the following pages.

Are you still unsure when to see your doctor for your symptoms?

If so, then just click here to see what symptoms mean you should see the doctor

Section 6

You are here:

Main Symptom

Sore throat

Diagnostic
questions

- Your personal diagnosis and advice

- **When to see the doctor**

You should go to see your doctor about your sore throat if:

- Your sore throat has lasted for more than 2 weeks without any improvement
- You can't swallow anything at all, or are not getting enough liquid down. (A sign that you are not getting enough liquid down is that you do not pass urine each day),
- You have a high temperature (38.5 °C or 101.3 °F) that has lasted for at least 3 days
- Your breathing is affected (becoming very wheezy or short of breath),
- You feel drowsy or confused (even if you don't have a temperature)
- You have had more than 5 sore throat attacks overall in the last year

Section 7

You are here:
Main Symptom Sore throat

When can I get better?

When should my sore throat clear up?

GPs find that by the time they see patients with sore throats, they report that on average:

- It starts to get better after 5 more days (i.e. 8 days from when it started)
- It can last between 2-3 weeks in total

Did you know?

Sometimes your symptoms may start to clear, or clear completely, and then come back again after a short while.

This can be because the original infection is taking a bit longer to finally settle, but often it means you have had bad luck and caught a new virus. This may then need a few further weeks to clear.

Section 8

You are here:

Main Symptom
Sore throat
Diagnostic questions

- Your personal diagnosis and advice
- When to see the doctor
- When can I get better?
- **Will seeing the doctor help me get better more quickly?**

Will seeing the doctor make me feel better more quickly?

Medical evidence shows that there is usually nothing that the doctor can do to speed up your recovery from a virus.

The main things the doctor can do are:

- Make sure there is nothing else more serious going on
- Give you advice on how to get relief from your symptoms
- Help your immune system to fight off the infection

We have provided detailed advice on all these things in the following pages so you do not need to wait for an appointment or a prescription.

Section 9

You are here:

Main Symptom

Sore throat

Diagnostic questions

- Your personal diagnosis and advice
- When to see the doctor
- When can I get better?
- Will seeing the doctor help me get better more quickly?
- **Can antibiotics help my symptoms?**

Would it help to try antibiotics for my symptoms?**In brief**

Medical evidence has shown that antibiotics do not help most people, as symptoms like these are usually caused by viruses and antibiotics do not work against viruses – our immune system is able to fight off the infection.

Antibiotics can reduce symptoms by less than 1 day in an illness that can last up to 3 weeks. They can cause side effects, and the more antibiotics one uses, the more 'resistant' the bugs become and they survive longer.



If you want to find out more about the risks and uses of antibiotics click [here](#)



Section 10

**More information about the risks and uses of antibiotics**

In the past, doctors have prescribed antibiotics thinking that they help. But we know now from recent medical evidence that antibiotics do not help most people.

There is some research evidence that on average antibiotics may help to reduce the number of days you will have a sore throat for by less than 1 day in an illness than can last up to 3 weeks. But studies have also shown that antibiotics are not recommended as an initial treatment because they can often cause side effects (such as diarrhoea, rashes, feeling sick) which in rare cases can be very severe (collapse, spasm of the airways).

Antibiotics are only useful for rare causes of sore throat (e.g. bacteria causing streptococcus or

‘strep throat’). Most common infections of the nose, throat, ears and chest are caused by viruses, and medical experts agree that antibiotics don’t work against viruses – our immune system has to fight off the infection.

Why taking antibiotics when not needed can be dangerous

Recent evidence has shown that overusing antibiotics or taking them when not needed (e.g. when our immune system can fight off the infection itself) can be dangerous. Doctors realise now that the more antibiotics one uses for common symptoms the easier it gets for the bugs to adapt and find ways to survive the antibiotics.

They become **‘antibiotic resistant’**, so that the antibiotics are becoming less effective at fighting infections and in the future they will no longer work for you. So we need to keep producing new kinds of antibiotics that are stronger but this can be very difficult, takes a lot of time and it is very costly.

Antibiotic resistance is becoming a big problem now as some killer diseases are already resistant to several antibiotics.

This is not just a problem for the person who takes antibiotics when they are not needed; it can also affect people who live close by (for example in the wider community) even if they do not take antibiotics themselves. This is because bugs can easily transfer around people, for example by air when sneezing.

There is also research evidence that antibiotics can reduce your ability to fight infections – this happens in two ways: First, they stop your body mounting the full antibody response. Secondly, they kill good bacteria that we all have in our throats, and which are important in the bodies defence against invading bacteria.

Section 11

You are here:

Main Symptom

Sore throat

Diagnostic questions

- Your personal diagnosis and advice
- When to see the doctor
- When can I get better?
- Will seeing the doctor help me get better more quickly?
- Can antibiotics help my symptoms?
- **Do my symptoms suggest something else?**

Do you think your symptoms might be a sign of something more serious?



If Yes, click here to find out more



Some people think their symptoms may be a sign of a serious condition and want to know more about these illnesses.

We have listed the most common conditions that may be a cause of concern for their symptoms of sore throat.

Just tick on any of these if you want to find out more.

Bronchitis



Meningitis



Tonsillitis



Emphysema and chronic bronchitis



Section 11

Information on other conditions

Bronchitis

This is just the name for an inflammation and irritation of the bronchial tubes in the lungs (at the top of the chest). It often occurs after a cold or flu virus, but can also be caused or made worse by cigarette smoke or air pollution.

The symptoms can include coughing up phlegm, discomfort or tightness in the chest, fatigue, sore throat or runny nose. Green sputum is common and does not mean that the infection is serious, even if it is blood-specked.

Although it is very unpleasant, acute bronchitis (lasting no more than 4 weeks) is not a dangerous condition. As it is mostly caused by viruses, antibiotics have very little effect. People were given antibiotics in the past, but now medical experts agree that the benefits are very slight, for example reducing the duration of cough of less than 1 day in an illness of 3-4 weeks.

For advice how to treat symptoms caused by bronchitis, tick **cough** at the end of the sore throat webpages.

Section 11

Information on other conditions

Meningitis

This is an infection of the membranes that cover the brain and the spinal cord. It can be caused by bacteria or viruses. Viral meningitis is the more common form of the disease but is normally less severe. Bacterial meningitis is a less common but more serious form of the disease.

The typical symptoms are:

- Constant generalised headache
- Confusion
- Drowsiness
- Sensitivity to bright lights, daylight or even the television
- High temperature, although hands and feet may be cold
- Neck stiffness - moving the chin to the chest will be painful at the back of the neck
- Vomiting
- Rapid breathing
- A purple rash that does not fade when you press a glass against it

You may also get other symptoms such as stomach pain, diarrhoea, joint and muscle pains.

If you have these symptoms then contact your GP right away.

Section 11

Information on other conditions

Tonsillitis

This is an infection of the tonsils, which are part of the throat.

It often occurs after a cold or flu virus. Tonsillitis occurs as part of pharyngitis (which is the medical term for an inflamed throat), however, tonsillitis is **not** a more serious illness than pharyngitis.

The symptoms of tonsillitis are very similar to a sore throat, such as pain when swallowing, fever, headache, and swollen glands. Patches of white pus on your tonsils are common and are a sign of your body's cells attacking the virus (i.e. a good sign that shows your body is fighting the infection well).

It is not a serious condition and as it is commonly caused by viruses, antibiotics have very little effect. People were given antibiotics in the past, but now new medical evidence shows that antibiotics are not very effective for most people (they give about half a day's benefit in an illness lasting 8 days) and they can also lead to side effects such as diarrhoea or a rash.

For advice on how to treat symptoms caused by tonsillitis, see the following pages later on.

In case you get repeated attacks (normally more than 5 per year) it is worth talking to your doctor about the pros and cons of surgery to take the tonsils out.

Section 11

Information on other conditions

Emphysema and chronic bronchitis

Emphysema occurs when the tissue of the lungs is damaged. **Chronic bronchitis** occurs when the bronchial tubes in the lungs (at the top of the chest) become chronically inflamed and results in a cough with phlegm for several months each winter.

In both emphysema and bronchitis, the airways are narrowed and it is difficult to breathe out. It is therefore difficult to walk far or be physically active without getting short of breath. These symptoms persist for months or years.

The most common cause of emphysema and chronic bronchitis is smoking and heavy smokers are most at risk.

If you think your symptoms match these then contact your GP.

Section 12

You are here:

Main Symptom
Sore throat
Diagnostic
questions

Advice on relieving your symptoms

- Things you can do yourself

Advice on relieving your sore throat

We have put together several advice suggestions based on medical evidence and what has been found useful by people with similar symptoms.

Tick the advice you want to see (you can tick more than one)

Things you can do yourself

Things you can get from the chemist

Things you can do yourself

- Gargling with salt water (a teaspoonful of salt in a glass of warm water) is a good way to relieve a sore throat.
- If the throat is very inflamed then a gargle with soluble aspirin dissolved in a glass of water can help (but avoid it if you have asthma and have breathing difficulties when taking aspirin).
- Avoid talking too much as this aggravates the throat and the voice-box.
- Keeping your throat moist helps to wash the infection away, so drinking plenty of fluids such as water, fruit juice, squash and warm drinks such as honey and lemon can help. Fluids can also help our immune system to fight off the infection because it needs plenty to function properly. If you have fever as well as this increases the risk of dehydration so you need to drink more fluids than normal.

Section 12

Things you can do yourself (cont.)

- Painkillers such as Paracetamol, aspirin and Ibuprofen help in controlling your pain and lower your temperature. Approximately half of the people with asthma need to avoid taking Ibuprofen and aspirin as they can make breathing more difficult. However, if you have taken them in the past and not experienced any side effects then you can continue taking them.
- Sucking pastilles or throat lozenges is also helpful as they can soothe the pain. There are some pastilles labelled as antiseptic but there is no good evidence that they are any better than from regular pastilles.
- People with similar symptoms report that steam inhalation can ease their symptoms as this opens the airways and stops viruses multiplying. There is some evidence from clinical trials showing this might be helpful for some, although more and larger studies are needed to be sure. You can inhale steam for 5 minutes 3 times a day: Fill half of a two pint sturdy bowl with boiling water and put a towel over your head and breathe in the hot steam or inhale through a gap in your hands. Taking hot showers may also help.
- If you think your symptoms might be caused or made worse by an allergic reaction, discovering the source and avoiding that substance the best treatment. Keeping a record of your symptoms when they occur (e.g. if seasonal or if they persist all year-round) is a good way of identifying what may trigger them.
- Avoid smoking or smoking atmospheres as these irritate the throat even more

Section 12

You are here:

Main Symptom
Sore throat
Diagnostic questions

**Advice on relieving
your symptoms**

- Things you can do yourself
- **Things you can ask your chemist**

Advice on relieving your sore throat**Things you can ask your chemist**

- Lozenges and throat sprays containing local anaesthetics such as benzocaine, lignocaine and benzalkonium can help relieve the pain.
- Zinc with vitamin C is commonly used to fight viruses. However, a review of 30 studies, involving a total of 11350 people, showed that taking vitamin C daily can only reduce the duration and severity of colds very slightly (up to 8%). The review has also shown that if you are under great physical or cold stress such as doing marathon running or being a skier, then vitamin C can be more effective (reduction up to 50%). We are not sure yet whether start taking vitamin C or increasing the dose at the beginning of a cold might have any useful effect, more research is needed to be sure.
- If you think your symptoms are due to an allergic reaction, then antihistamine drugs are used to relieve allergies. They are taken by mouth and contain ingredients such as loratadine and cetirizine hydrochloride.

Section 13

Some people with a sore throat experience related problems – here are the most common ones:

**Do you have any of these problems?
(you may tick more than one)**

Feeling as if your throat is closing up?	Yes	No
Feeling weak and tired?	Yes	No
Being unable to sleep properly?	Yes	No
Experiencing slight shortness of breath when you are physically active e.g. walking, housework?	Yes	No

Section 13

You are here:

- Main Symptom
- Sore throat
- Diagnostic questions
- Advice on relieving your symptoms
- Other related problems**
 - Throat closing up

What you can do if your throat is closing up

Your **throat may feel as if it is closing up** if your tonsils (which are part of the throat) have become bigger with the infection. This should gradually go away as the soreness eases. The suggestions made previously will help reduce the pain.

Section 13

You are here:

- Main Symptom
- Sore throat
- Diagnostic questions
- Advice on relieving your symptoms
- Other related problems**
 - Feeling weak and tired

What you can do if you are feeling weak and tired

As your body uses a lot of energy to fight off the cold virus you tend to **feel weak and tired**

- You can take paracetamol or ibuprofen to reduce general pains and aches
- See also **Advice on helping your immune system** later on for further useful suggestions.

Section 13

You are here:

Main Symptom

Sore throat

Diagnostic questions

Advice on relieving
your symptoms**Other related
problems**

- Throat closing up
- Feeling weak and tired
- **Unable to sleep properly**

What you can do if you are unable to sleep properly

Your sleep may be affected because of the blocked throat and the difficulty in swallowing:

There are no good studies which show clearly what can help but some people find the following helpful:

- Paracetamol can help with the pain
- Steam inhalations can also be soothing
- Sleep with your head on high pillows to help with the breathing.
- If your symptoms seem to be related to an allergic reaction, then an antihistamine can help. There are some antihistamines that cause drowsiness and others that are less likely to make you sleepy. If you are using any of these for the first time they may cause some drowsiness, so it is useful to take them at bedtime if your symptoms keep you awake at night.

If an antihistamine does not help or you are short of breath or wheezing then you need to see your doctor.

Section 13

You are here:

Main Symptom

Sore throat

Diagnostic questions

Advice on relieving your
symptoms**Other related problems**

- Throat closing up
- Feeling weak and tired
- Unable to sleep properly
- **Shortness of breath**

What you can do if you have slight shortness of breath

Experiencing **slight shortness of breath** when being little or no physically active could be a sign that the infection has become chesty. This can affect any or all of the breathing passages which link together the mouth, throat, nose and lungs and one of the most common symptoms is persistent chesty cough and/or coughing up phlegm. You will have the chance to see other web-pages for further advice on those symptoms later on.

Section 14

You are
here:

Main Symptom

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Diagnostic
questions

Advice on
relieving your
symptoms

Other related
problems

What else
can I do?

You are here:	<h3>What else you can do</h3> <h4>Advice on helping your immune system fight the infection</h4>
	<p>The advice given earlier can help this natural process but there are also a few other things you could do that can help to reduce the impact of your symptoms on your daily activities.</p> <p>Look after yourself physically and mentally by:</p> <ul style="list-style-type: none"> ✓ Eating a healthy, balanced diet containing plenty of fruit and vegetables. The body needs a good supply of nutrients to fight off the infection ✓ Keep warm but try not to let the room get stuffy, as a little fresh air may help you to feel better. ✓ Overheated rooms dry out the throat even further. Keeping a window slightly open helps to lower the room temperature and increase the humidity in the room that helps to ease the infected throat. ✓ Get extra rest after work; slow down just a little from your usual routine. It is not necessary to stay at home in bed but listen to your body if it needs more rest: maybe this would be a good opportunity to watch TV or a nice film, read a magazine or a book, or just relax. ✓ Echinacea (a herb) can help reduce the duration of cold infections by 1.4 days, a recent review has shown. This review, involving over 1600 people, also showed that Echinacea reduces the chance of getting a cold by over 55%. However, it was not clear from those studies how much Echinacea people need to take and for how long before they see the benefits, more research is needed to be sure. You can get Echinacea from most chemists, supermarket pharmacies, or health food shops. ✓ Medical experts agree that stress can have a significant negative effect on our mental and physical health and reduce the ability of the immune system to fight off infections. So any change that can reduce or control it can help improving your quality of life and help your immune system even further to fight off the infection.

Section 15

You are here:

Main Symptom

Sore throat

Diagnostic questions

Advice on relieving
your symptomsOther related
problems

What else can I do?

**Frequently Asked
Questions**

**Do you have any concerns about
managing your symptoms overall or about your treatment?**

Frequently Asked Questions

	We have put together information about common questions and concerns. Just tick each one you feel applies to you for more advice on those points.
I'm not sure if I'm doing the right thing	
I tried everything and I'm still unwell, I don't think there is anything else I can do	
Only antibiotics work for me when my symptoms are bad - without them I will not get better and may get worse	
I need to get better quickly and cannot wait for my symptom(s) to take their natural course	
I'm not sure I can make my symptoms go away	
I had a nasty infection in the past and I want to ensure that I won't go through the same thing again	
My doctor prescribed antibiotics for a throat infection but I am feeling better now. Do I need to finish the course?	
Some of the medication suggested contains local anaesthetic, isn't this dangerous?	
I don't really like taking medications, I feel that they may be harmful to the body	
I don't want to take medications, I prefer the body to fight off the infection naturally	
Is it safe to take Paracetamol and Ibuprofen together?	
I heard that steroids can help with the swelling and the pain	
Having to take medicine mixtures worries me as I've heard they increase the blood pressure	

Section 15

Frequently Asked Questions on managing my symptoms**I'm not sure if I'm doing the right thing**

Although having a sore throat can be very painful, especially when you swallow and may feel like your throat is closing up, it seldom leads to more serious complications (only about 1 in 400 times). If you experience symptoms you have never had before or which are worse than you have had in the past then you may worry that these are a sign of a serious illness. However, medical experts agree that these symptoms gradually go away as the soreness eases; you do not need to worry if they take a few days to settle as long as they start to settle after 8 days and do not last longer than 3 weeks.

Section 15

Frequently Asked Questions on managing my symptoms**I tried everything and I'm still unwell,
I don't think there is anything else I can do**

The various things you are already doing may relieve your symptoms but will not shorten their duration. Sore throat symptoms can take quite a while, sometimes up to 2-3 weeks, to clear away completely.

For a small minority of people (5-10%) this can take even up to 4-6 weeks because they may have more sensitive linings in their throat which take longer to recover. Or sometimes people are just unlucky enough to get another virus before recovering completely from the previous infection.

In either case, the doctor can do nothing really unless there is a change of symptoms i.e. they are getting much worse.

Prescribed medication such as antibiotics can do very little to speed up recovery. The advice given earlier on, based on your symptoms, will help to reduce the impact of your symptoms and enable you to get on with your everyday life. Try some of the advice suggestions if you have not already done so, and come back to this website in 2-3 days to check the progress of your symptoms.

Section 15

Frequently Asked Questions* on managing my symptoms*Only antibiotics work for me when my symptoms are bad –
without them I will not get better and may get worse**

Most common infections and symptoms such as sore throat are caused by viruses, but antibiotics are only effective for some infections caused by bacteria. You may have taken antibiotics in the past and felt well soon after that. This is usually due to the natural course of the symptoms – most people visit their doctor when they have had their symptoms for some time and by then the immune system has started to fight back the viruses on its own, so people are about to get better naturally anyway.

In the past doctors assumed that antibiotics were helpful for cold and flu related symptoms. Now doctors have new medical evidence that has shown that antibiotics don't work for these symptoms, so they tend not to prescribe them any more.

There is no good scientific evidence that antibiotics can prevent symptoms from getting worse or protect you from future infections.

There is also evidence from studies that antibiotics can reduce your ability to fight infections – this happens in two ways. Antibiotics stop your body mounting the full antibody response. They also kill good bacteria that we all have in our throats, and which are important in the bodies defence against invading bacteria.

Section 15

Frequently Asked Questions* on managing my symptoms*I need to get better quickly and cannot wait for my symptom(s)
to take their natural course**

As sore throat symptoms are mostly caused by viruses, recovery even with antibiotics can not be speeded up and may take up to 2-3 weeks although symptoms should start to settle after the first 5-6 days. Your immune system is trying to fight off the virus and in doing so your body may need to slow down for a while until it recovers. However, this does not mean that you have to endure the symptoms until they completely settle. The advice given above, based on your symptoms, will help to reduce their impact and help you continue with your everyday life.

Section 15

Frequently Asked Questions on managing my symptoms

I'm not sure I can make my symptoms go away

Sore throat symptoms take a few days before they start to settle and a bit longer before clearing away completely. Most of the work in helping our body to recover is carried out by our immune system. Following the advice we suggested earlier can help you easing off the symptoms but they still need to take their course before completely going away. You do not have to follow all the advice suggestions; you can try the ones you feel most comfortable with.

Section 15

Frequently Asked Questions on managing my symptoms

I had a nasty infection in the past and I want to ensure that I won't go through the same thing again

Having a bad infection in the past does not necessarily make you more vulnerable to future infections. If you feel you are coming down with something similar to what you had before then the advice given earlier on can help limit the impact of those symptoms on your body. There is no scientific research suggesting that treatments such as antibiotics or other medication can prevent symptoms from getting worse or protect you from future infections.

Section 15

Frequently Asked Questions on the treatment prescriptions

My doctor prescribed antibiotics for a throat infection but I am feeling better now. Do I need to finish the course?

Taking the full course of an antibiotic as prescribed is important because of two reasons. Firstly, although you may feel better and the symptoms have gone, some of the bugs that caused your infection may still be present in your body. If the antibiotic course is not completed these remaining bugs may start to multiply again and your infection could come back. The second reason is that some bugs become resistant to certain antibiotics. This means that a previously effective antibiotic loses its ability to kill the bugs that cause a particular infection. If the full course of antibiotics is not taken then there is an increased risk of such antibiotic resistance.

Section 15

Frequently Asked Questions on the treatment prescriptions

**Some of the medication suggested contains local anaesthetic,
isn't this dangerous?**

The dose is so small that it poses no danger – it is just enough to relieve some of the pain and soothe the throat.

Section 15

Frequently Asked Questions on the treatment prescriptions

**I don't really like taking medications, I feel that they
may be harmful to the body**

We have not suggested any medications when there is evidence they are harmful to the body. The treatment advice earlier on gives details when some medications have side effects or when evidence is not yet clear. You don't have to take any medications and we have suggested alternative ways of easing your symptoms.

Section 15

Frequently Asked Questions on the treatment prescriptions

**I don't want to take medications,
I prefer the body to fight off the infection naturally**

You don't have to take any medications. The medications are just to ease symptoms and not cure you. We have suggested alternatives ways of easing your symptoms without having to take medications.

Section 15

Frequently Asked Questions on the treatment prescriptions

Is it safe to take Paracetamol and Ibuprofen together?

Yes it is safe, and you can take full doses of both. If you have indigestion, past stomach ulcers or asthma then avoid taking Ibuprofen.

Section 15

Frequently Asked Questions on the treatment prescriptions

I heard that steroids can help with the swelling and the pain.

This is still an experimental treatment and there is not enough evidence to know who is likely to benefit most. There is an indication that they can reduce the pain and calm down the swelling but they have side effects e.g. eating more, mood swings and getting fungal infections in the mouth.

Section 15

Frequently Asked Questions on the treatment prescriptions

**Having to take medicine mixtures worries me
as I've heard they increase the blood pressure**

There is no good evidence of any harmful effect. If you take decongestants containing pseudoephedrine there might be a small negative effect on blood pressure in the short term. Therefore, if you have high blood pressure that you know is not well controlled but want to take something, you could avoid taking mixtures containing pseudoephedrine. However, more studies need to be done to know for sure.

Section 16

Do you have any other symptoms you would like advice about?

Cough

Sore throat

Runny or stuffy nose

Pain or pressure in the face

Section 17

Who is providing the advice?

All the information you received today has been put together by health researchers and health care professionals experts in their field at the University of Southampton. The information was based on reliable research evidence drawn from many scientific resources, including these papers:

- 1) Arroll B, Kenealy T(2005) Antibiotics for the common cold and acute purulent rhinitis. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD000247
- 2) De Sutter AIM, Lemiengre M, Campbell H. Antihistamines for the common cold. Cochrane Database of Systematic Reviews 2003, Issue 3. Art. No.: CD001267.
- 3) Del Mar CB et al (2006) Antibiotics for sore throat. Cochrane Database of Systematic Reviews, Issue 4, Art. No. CD000023
- 4) Douglas RM, Hemila H., Chalker E, Treacy B (2007). Vitamin C for preventing and treating the common cold. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD000980
- 5) Fahey et al (1998) Quantitative systematic review of randomised controlled trials comparing antibiotic with placebo for acute cough in adults. British Medical Journal, 316: 906-10.
- 6) Fahey et al (2004) Antibiotics for acute bronchitis. Cochrane Database of Systematic Reviews, Issue 4. Art. No.:CD000245
- 7) Hueston WJ (1997) Antibiotics: neither cost effective nor 'cough' effective. Journal of Family Practice, 44:261-5.
- 8) Shah SA, Sander S, White CM, Rinaldi, M, Coleman CI (2007). Evaluation of Echinacea for the prevention and treatment of common cold: a meta-analysis. The Lancet Infectious Diseases, Vol. 7(7): 473-480.
- 9) Schroeder K, Fahey T (2004) Over-the-counter medications for acute cough in children and adults in ambulatory settings. Cochrane Database of Systematic Reviews, Issue 4. Art. No.: CD001831
- 10) Singh M (2006) Heated, humidified air for the common cold. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD001728
- 11) Taverner D, Latte J (2007) Nasal decongestants for the common cold. Cochrane Database of Systematic Reviews 2007, Issue 1. Art. No.: CD001953.
- 12) Verkatesum P, Innes JA (1995) Antibiotic resistance in common acute respiratory pathogens. Thorax, 50:418-3.
- 13) Verheij T, Hermans J, Kaptein A, Mulder J (1995) Acute bronchitis: course of symptoms and restrictions in patients daily activities. Scandinavian Journal of Primary Health Care, 13:8-12

Appendix 10 Intervention Materials for Ear-ache

Section 1

Your personal cold and flu doctor

Do you:

- Feel under the weather and unwell?
- Have a cough or a sore throat?
- Have a stuffy nose or earache?

➤ **Are you not sure if you need to see the doctor?**

- ④ How can you tell if your symptoms are a sign of an illness that may need medical diagnosis and treatment?

➤ **What can you do to feel better?**

- ④ What is the most effective way to treat your own symptoms so they don't interfere with your daily life?

What you are going to see in the following pages:

The following pages are designed to give you expert advice about your symptoms – you can:

- Get detailed advice on how to cope with your specific problems, including whether you should see your doctor.
- Find out the answers to all your questions about your symptoms and their treatment.
- Check if there is anything more you can do to help your body recover.

Our aim is to provide you with all the information you could get from seeing your doctor, but with the advantage that:

- You don't have to wait for an appointment – you can consult the website doctor any time, as often as you like.
- You don't have to travel to the surgery and sit there waiting for your appointment with other unwell people!
- You can check for further information if your symptoms change.

Who is providing the advice?

A group of doctors, health experts and researchers based at the University of Southampton has put together all the advice and information you will see. The information has been based on scientific and reliable evidence. You can see the references to some of the main sources we used at the end so that you can check these for yourself if you want to.

Section 2

**So that we can give you the right advice,
we need you to tell us about your symptoms:**

You are here:

Main

symptom

Which symptom is bothering you most? (please tick one only)	
Cough	
Sore throat	
Runny or stuffy nose	
Earache	
Pain or pressure in the face	

Section 3

You are here:

Main Symptom

Earache

**Diagnostic
questions**

How long has your ear been troubling you? (please tick one only)	
Less than 5 days	
Between 5-10 days	
More than 10 days	

Do you have pain in one or both ears?		Yes	No
<ul style="list-style-type: none"> If No, please continue with the <u>next block</u> of questions If Yes: Over the last 3-4 days, has the pain in your ear been: (please tick one only) 			
Steadily getting worse			
Not getting better at all			
Getting a little better			

Section 3

Do you have a runny ear (pus or fluid coming out from one or both ears)?	Yes	No
<ul style="list-style-type: none"> ▪ If No, please continue with the <u>next block</u> of questions ▪ If Yes, How long have you had a runny ear for? (please tick one): 		
I have had a runny ear for less than 10 days		
I have had a runny ear for 10 days or more		

You are**here:**

Main

Symptom

Earache

Do you have pain and a runny ear at the same time? Or**Yes****No**

Did you have pain first, followed by fluid coming out, and then less pain once the fluid came out?

Yes**No****Please tick each of the symptoms you may have****Yes****No**

Itchiness

Have you had a high fever (a temperature of more than 38.5 °C or 101.3 °F) for at least 3 days?

Do you have a severe headache, stiff neck and you avoid bright lights even if you have no temperature?

Did you have *mastoiditis* in the past?

Section 4

You are

Main
Symptom
Earache
Diagnostic
questions

**Your
personal
diagnosis
and advice**

Your personal diagnosis report

**You should go to see your doctor about
your symptoms**

This may be because of any of these signs:

- You have had a runny ear or (ear discharge) for more than 10 days
- You have had a high temperature (38.5 °C or 101.3 °F) and/or severe pain for more than 3 days
- The bone just behind the bottom of the ear (the mastoid bone) is tender or swollen
- You have a severe headache, you cannot stand bright lights and have a stiff neck (even if you have no temperature)

These are signs that you need a medical check-up.

Section 4

You are here:

Main Symptom
Earache
Diagnostic
questions

**Your personal
diagnosis and
advice -
Warning**

Your personal diagnosis report

Warning

Because you had mastoiditis in the past, you need to be more careful than other people when you have an ear infection. There are no signs that you need to see the doctor yet, but if your infection or your fever gets worse then you should go to see your doctor right away.

Section 4

You are here:

Main Symptom

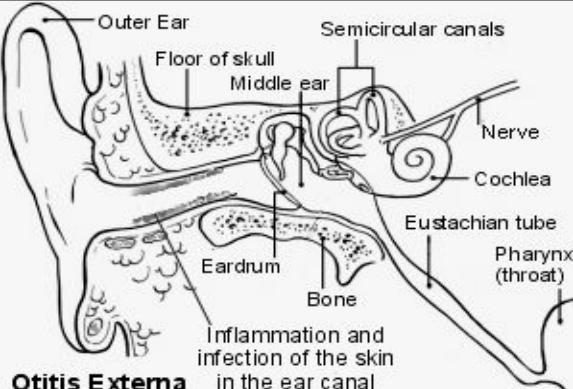
Earache

Diagnostic
questions

Your personal diagnosis report

You have symptoms of an inflammation of the outer ear known as otitis externa. Otitis externa is not a serious illness that needs to be seen by the doctor.

This is an inflammation of the ear canal. As the picture shows, this is the tube that goes from the outside part of the ear to the eardrum. It is usually caused by an infection, allergy or an irritant such as shampoo or water that gets inside the ear (also known as swimmer's ear) or damage to the skin by objects such as cotton buds.

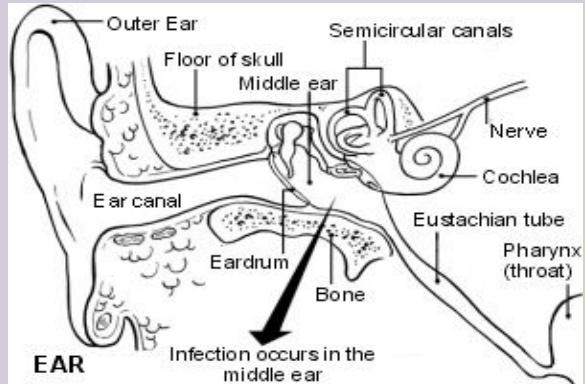


Section 4

Your personal diagnosis report

You have symptoms of an infection of the middle ear known as otitis media.

As the picture shows, there is a connecting tube (the 'Eustachian tube') between the throat and the ear. The infection starts in the throat and then spreads through the Eustachian tube to the



ear. The ear drum and the cavity behind it become inflamed or sore because of germs or viruses and your body produces fluid to fight the infection. The fluid in turn causes pressure behind the eardrum, causing pain and a high temperature.

Did you know?

The pressure from the fluid in the eardrum builds up and the eardrum bursts. This leads in a perforation (i.e. a small hole) which lets the fluid out and in turn eases the pain.

Ear infection often follows a cold so you may also have a sore throat, runny nose, a headache and the glands in your neck may get larger.

If you have any of these symptoms as well, you will have the chance at the end of these webpages to get advice about them.

Section 5

You are here:

Main Symptom

Earache

Diagnostic
questions

- Your personal diagnosis and advice
- When to see the doctor

Do I need to see the doctor for these symptoms?

The symptoms you have at present are not a sign of a serious illness that needs to be seen by the doctor.

If there is pus or fluid coming out regardless for how long, make a routine appointment **4-6 weeks after your infection clears** in order your GP to check the eardrum has healed properly. This will also reduce the chance of the infection recurring.

Are you still unsure when to see your doctor for your symptoms?



If so, then just click here to see what symptoms mean you should see the doctor.

Section 6

You are here:

Main Symptom

Earache

Diagnostic
questions

- Your personal diagnosis and advice

- When to see the doctor

You should go to see your doctor about your
ear infection if:

- It has lasted for more than 10 days without any improvement
- It still causes major pain after 4 days
- You have a high temperature (38.5 °C or 101.3°F) that has lasted for at least 3 days
- You have a runny ear (or ear discharge for more than 10 days)
- If you had such infection 3 or more times in the past year

Section 7

You are here:

Main Symptom

Earache

Diagnostic questions

- Your personal diagnosis and advice
- When to see the doctor
- **When can I get better?**

When should my symptoms clear up?

GPs find that the patients they see report that on average:

- Their symptoms last between 4-10 days
- If there is severe pain, it often stays bad for 2-3 days before settling down
- Pus or fluid may come out for up to 10 days

Did you know?

Sometimes your symptoms may start to clear, or clear completely, and then come back again after a short while.

This can be because the original infection is taking a bit longer to finally settle, but often it means you have had bad luck and caught a new virus. This may then need a few further days to clear. If you had such infections 3 or more times in the past year then you need to see your doctor.

Section 8

You are here:

Main Symptom

Earache

Diagnostic
questions

- Your personal diagnosis and advice
- When to see the doctor
- When can I get better?
- **Will seeing the doctor help me get better more quickly?**

Will seeing the doctor help my ear infection get better more quickly?

Sadly, medical evidence shows that for most people there is usually nothing that the doctor can do to speed up your recovery from a virus.

The main things the doctor can do are:

- Make sure there is nothing else more serious going on
- Give you advice on how to get relief from your symptoms
- Help your immune system to fight off the infection

We have provided detailed advice on all these things in the following pages so you do not need to wait for an appointment or a prescription.

Section 9

You are here:

Main Symptom

Earache

Diagnostic
questions

- Your personal diagnosis and advice
- When to see the doctor
- When can I get better?
- Will seeing the doctor help me get better more quickly?
- **Can antibiotics help my symptoms?**

Would it help to try antibiotics for my symptoms?

In brief

The symptoms you currently experience do not require antibiotics to settle down. Medical evidence has shown that antibiotics do not help most people, as symptoms like these are usually caused by viruses and antibiotics do not work against viruses – our immune system is able to fight off the infection.

There is some research evidence that antibiotics may help reducing the number of days you will have an ear infection by less than 1 day but there is no evidence they can reduce the chance of complications happening.



If you want to find out more about the risks and uses of antibiotics click here



Section 10



More information about the risks and uses of antibiotics

In the past doctors have prescribed antibiotics in good faith, thinking that they help. But we know now from recent medical evidence that antibiotics do not help the great majority of people.

There is some evidence that antibiotics may help to reduce the number of days you will have symptoms of an ear infection by less than 1 day in an illness that can last up to 10 days. But studies have also shown that antibiotics can cause side effects (such as diarrhoea, rashes, feeling sick) which in rare cases can be very severe (for example collapse, spasm of the airways).

Antibiotics are prescribed when there is ear infection with pain and fever which is not starting to settle after 4 days or, pus or fluid comes out (with or without pain and fever) for more than 10 days.

Why taking antibiotics when not needed can be dangerous

Recent evidence has shown that overusing antibiotics or taking them when not needed (e.g. when our immune system can fight off the infection itself) can be dangerous. Doctors realise now that the more antibiotics one uses for common symptoms the easier it gets for the bugs to adapt and find ways to survive the antibiotics. They become '**antibiotic resistant**', so that the antibiotics are becoming less effective at fighting infections and in the future they will no longer work for you. So we need to keep producing new kinds of antibiotics that are stronger but this can be very difficult, takes a lot of time and it is very costly.

Antibiotic resistance is becoming a big problem now as some killer diseases are already resistant to several antibiotics. This is not just a problem for the person who takes antibiotics when they are not needed; it can also affect people who live close by (for example in the wider community) even if they do not take antibiotics themselves. This is because bugs can easily transfer around people, for example by air when sneezing.

There is also research evidence that antibiotics can reduce your ability to fight infections – this happens in two ways: First, they stop your body mounting the full antibody response. Secondly, they kill good bacteria that we all have in our throats, and which are important in the bodies defence against invading bacteria.

Section 11

You are here:

Main Symptom
Earache
Diagnostic
questions

- Your personal diagnosis and advice
- When to see the doctor
- When can I get better?
- Will seeing the doctor help me get better more quickly?
-

Do you think your earache might be a sign of something more serious?



If yes, click here to find out more

Some people think their symptoms may be a sign of a serious condition and want to know more about these illnesses.

We have listed the most common conditions that may be a cause concern for earache. Just tick on any of these if you want to find out more.

Tonsillitis	<input type="checkbox"/>
Mastoiditis	<input type="checkbox"/>
Meningitis	<input type="checkbox"/>
Chronic otitis media	<input type="checkbox"/>

Section 11

Information on other conditions

Tonsillitis

This is an infection of the tonsils, which are part of the throat and it often occurs after a cold or flu virus. Tonsillitis occurs as part of pharyngitis (which is the medical term for an inflamed throat), but tonsillitis is **not** a more serious illness than pharyngitis.

The symptoms of tonsillitis are pain when swallowing, fever, headache, and swollen glands. Patches of white pus on your tonsils are common and are a sign of your body's cells attacking the virus (i.e. a good sign and showing your body is fighting the infection well).

It is not a serious condition and as it is commonly caused by viruses, antibiotics have very little effect for most people. People were given antibiotics in the past, but now new medical evidence shows that antibiotics are not very effective for most people (they give about half a day's benefit in an illness lasting 8 days) and they can also give side effects such as diarrhoea or a rash.

For advice how to treat symptoms caused by tonsillitis, tick **sore throat** at the end of the earache webpages.

Section 11

Information on other conditions

Mastoiditis

This is an infection of the mastoid bone which is just behind the ear; it is usually a result of a middle ear infection that has spread from the ear to the mastoid bone. It usually affects children. It is relatively uncommon and much less dangerous than it used to be and it can be treated effectively.

Symptoms include pain, tenderness and swelling **behind** the ear, earache, headache or fever. The individual becomes much more unwell and stays more unwell than would be expected from a simple ear infection (e.g. significant pain and high fever lasting more than 4 days). If you think you have such symptoms now or you had mastoiditis in the past and you are not sure now then contact your doctor.

Section 11

Information on other conditions

Meningitis

This is an infection of the membranes that cover the brain and the spinal cord. It can be caused by bacteria or viruses. Viral meningitis is the more common form of the disease but is normally less severe. Bacterial meningitis is a less common but more serious form of the disease.

The typical symptoms are:

- Constant generalised headache
- Confusion
- Drowsiness
- Sensitivity to bright lights, daylight or even the television
- High temperature, although hands and feet may be cold
- Neck stiffness - moving the chin to the chest will be painful at the back of the neck
- Vomiting
- Rapid breathing
- A purple rash that does not fade when you press a glass against it

You may also get other symptoms such as stomach pain, diarrhoea, joint and muscle pains.

If you have these symptoms contact your GP right away.

Section 11

Information on other conditions

Chronic Otitis Media

This happens when ear infections keep coming back, or one infection lasts for a very long time (over a month). It often has less severe symptoms, so the infection may be unnoticed and untreated for a long time.

If you had ear infection three times or more in the last year or your current symptoms persist without settling down, then contact your doctor.

Section 12

You are here:

Main Symptom
Earache
Diagnostic
questions

Advice on relieving your symptoms

- **Things you can do yourself – Otitis Externa**

Advice on relieving your ear infection

We have put together several advice suggestions based on medical evidence and what has been found useful by people with similar symptoms

Things you can do yourself

- Painkillers such as Paracetamol and Ibuprofen help in controlling the pain and lower your temperature. Approximately half of people with asthma need to avoid taking Ibuprofen and aspirin as they can make breathing more difficult. However, if you have taken them in the past and not experienced any side effects then you can continue taking them.
- If the ear is leaking, do not push anything (e.g. cotton wool or buds) into the canal. The ear has special skin linings inside that help to clear it and even cotton wool can damage it.
- Avoid scratching or poking the finger inside the ear as it can damage the delicate lining and the ear canal may become more swollen, which in turn will make the ear even itchier
- If you are wearing ear protection pads, for example at work, avoid wearing them for a few days as they keep the ear moist and slow down the healing process.

Section 12

You are here:

Main Symptom

Earache

Diagnostic questions

Advice on relieving your symptoms

- Things you can do yourself – Otitis Media

Advice on relieving your ear infection

We have put together several advice suggestions based on medical evidence and what has been found useful by people with similar symptoms.

Tick the advice you want to see (you can tick more than one)

Things you can do yourself

Things you can get from your chemist

Things you can do yourself

- Try to avoid swimming because dirty water can get inside and there is an increased chance a perforated ear drum can get re-infected.
- Painkillers such as Paracetamol and Ibuprofen help in controlling the pain. Approximately half of the people with asthma need to avoid taking Ibuprofen and aspirin as they can make breathing more difficult. However, if you have taken them in the past and not experienced any side effects then you can continue taking them.
- Drinking more clear liquids can help our immune system to fight off the infection because it needs plenty of fluids to function properly. Increasing fluids reduces the risk of dehydration as well, especially if you have fever too.

Section 12

You are here:

Main Symptom

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Diagnostic questions

Advice on relieving your symptoms

- Things you can do yourself
- **Things you can ask your**

Advice on relieving your ear infection

Things you can ask your chemist

- Nose drops containing decongestants (i.e. ingredients such as phenylephrine, hydrochloride or oxymetazoline) may be used to reduce the swelling in the nose and back of the throat and help to keep the Eustachian tubes clear and drain the middle ear. Unblocking these tubes will release the pressure and so relieve the pain. However, this has not been proved to shorten the duration of otitis media.
- Zinc with vitamin C is commonly used to fight viruses. However, a review of 30 studies, involving a total of 11350 people, showed that taking vitamin C **daily** can only reduce the duration and severity of colds very slightly (up to 8%). The review has also shown that if you are under great physical or cold stress such as doing marathon running or being a skier, then vitamin C can be more effective (reduction up to 50%). We are not sure yet whether start taking vitamin C or increasing the dose at the beginning of a cold might have any useful effect, more research is needed to be sure.

Section 13

You are here:

Main Symptom

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questions

Advice on relieving your symptoms

- Things you can do yourself
- Things you can ask your chemist

Other related problems

Some people with ear ache experience related problems – here are the most common ones:

**Do you have any of these?
(you may tick more than one)**

Difficulty swallowing?	Yes	No
Feeling weak and tired?	Yes	No
Being unable to sleep properly?	Yes	No
Dulled hearing (from one or both ears)	Yes	No

Section 13

You are here:

Main Symptom
Earache
Diagnostic questions
Advice on relieving
your symptoms
**Other related
problems**
• **Difficult to
swallow**

What you can do if you find it difficult to swallow

Difficulty in swallowing: this is usually caused by an inflamed throat and swollen glands in the neck.

The best treatment is paracetamol in proper doses (2 tablets four times a day). If this does not help ask your chemist for lozenges and throat sprays containing local anaesthetics and lozenges containing anti-inflammatory ingredients.

Section 13

You are here:

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Advice on relieving
your symptoms

What you can do if you feel weak and tired

As your body uses a lot of energy to fight off the cold virus you tend to **feel weak and tired**

- You can take paracetamol or ibuprofen to reduce general pains and aches
- See also **Advice on helping your immune system** later on for further useful suggestions.

Section 13

You are here:

Main Symptom
Earache
Diagnostic questions
Advice on relieving
your symptoms

**Other related
problems**

- Difficult to swallow
- Feeling weak and tired
- **Unable to sleep properly**

What you can do if you have problems with sleep

Having **problems with sleeping** might be due to the pain, so taking painkillers such as paracetamol or ibuprofen can help ease the pain and let you get some rest.

Section 13

You are here:

Main Symptom

Earache

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Advice on relieving
your symptoms

Other related
problems

- Difficult to swallow
- Feeling weak and tired
- Unable to sleep properly
- **Dulled hearing**

What you can do if you have dulled hearing

Dulled hearing (from one or both ears): This is one of the common symptoms for an ear infection and is caused when fluid is trapped in the ear. It is nothing serious and when the fluid clears, hearing is restored as well. If it persists over 10 days, then see your doctor.

Section 14

You are here:

Main Symptom

Earache

Diagnostic

questions

Advice on relieving
your symptoms

Other related
problems

What else you can do

Advice on helping your immune system fight the infection

The advice given earlier can help this natural process but there are also a few other things you could do that can help to reduce the impact of these symptoms on your daily activities.

What else can I do?

Look after yourself physically and mentally by:

- ✓ Eating a healthy, balanced diet containing plenty of fruit and vegetables. The body needs a good supply of nutrients to fight off the infection.
- ✓ Get extra rest after work; slow down just a little from your usual routine. It is not necessary to stay at home in bed but listen to your body if it needs more rest: maybe this would be a good opportunity to watch TV or a nice film, read a magazine or a book, or just relax.
- ✓ Keep warm but try not to let the room get stuffy, as a little fresh

air may help you to feel better.

- ✓ Medical evidence shows that stress can significantly reduce the ability of the immune system to fight off infections. Therefore, trying to reduce some of the stress from daily life can have a significant positive impact on your mental and physical health, and help your immune system even further to fight off the infection.

Section 15

You are here:

Main Symptom
Earache
Diagnostic
questions
Advice on
relieving your
symptoms
Other related
problems
What else can I
do?

Frequently Asked Questions

Do you have any concerns about managing your symptoms overall or about your treatment?

Frequently Asked Questions

We have put together information about common questions and concerns. Just tick each one you feel applies to you for more advice on those points.

I'm not sure if I'm doing the right thing

I tried everything and I'm still unwell, I don't think there is anything else I can do

Is having fluid running out of the ear a sign of something serious?

Only antibiotics work for me when my symptoms are bad - without them I will not get better and may get worse

I need to get better quickly and cannot wait for my symptom(s) to take their natural course

I had a nasty infection in the past and I want to ensure that I won't go through the same thing again

Some of the medication suggested contains local anaesthetic, isn't this dangerous?

I don't really like taking medications, I feel that they are harmful to the body

I don't want to take medications, I prefer the body to fight off the infection naturally

Is it safe to take Paracetamol and Ibuprofen together?

Section 15

Frequently Asked Questions on managing my symptoms

I'm not sure if I'm doing the right thing

Although ear infection and its associated symptoms can be extremely uncomfortable they seldom lead to more serious complications, so you do not need to worry about these symptoms. If you experience symptoms you have never had before or which are worse than you have had in the past then you may worry that these symptoms are a sign of a serious illness. However, medical experts agree that you do not need to worry if the symptoms take a few days to settle, as long as they do not last over 10 days and pain and/or fever begin to settle after 3-4 days.

Section 15

Frequently Asked Questions on managing my symptoms

I tried everything and I'm still unwell, I don't think there is anything else I can do

The various things you are already doing may relieve the symptoms but will not shorten their duration. Ear infection can take quite a few days, sometimes up to 10 days, to clear away completely. For some people (approximately 5-10% of people) these symptoms can take longer to clear away completely, sometimes up to 4-6 weeks.

Prescribed medication such as antibiotics can do very little to speed up recovery. The advice given earlier on, based on your symptoms, will help to reduce the impact of your symptoms and enable you to get on with your everyday life. Try some of the advice suggestions if you have not already done so, and come back to this website in 2-3 days time to check the progress of your symptoms.

Section 15

***Frequently Asked Questions* on managing my symptoms**

Is having fluid running out of the ear a sign of something serious?

Sometimes the pressure from the fluid inside the ear builds up and can cause the eardrum to burst forming a hole and pus will then be seen running out of the ear. This sometimes helps to relieve the pain by releasing the pressure on the eardrum. This is a normal part of ear infections and after a few days the skin of the eardrum hole (or perforated ear) heals up. It does not cause hearing loss or damage.

If you have discharge, make a routine appointment 4-6 weeks after the infection so the doctor can check if the eardrum has healed and the infection is completely cured. This will also reduce the chances of an infection recurring. Until the ear is checked again it is wise not to swim.

Section 15

***Frequently Asked Questions* on managing my symptoms**

Only antibiotics work for me when my symptoms are bad – without them I will not get better and may get worse

Most common infections and symptoms such as the ones affecting the ear are caused by viruses, but antibiotics are only effective for some infections caused by bacteria. You may have taken antibiotics in the past and felt well soon after that. This is usually due to the natural course of the symptoms – most people visit their doctor when they have had their symptoms for some time and by then the immune system has started to fight back the viruses on its own, so people are about to get better naturally anyway.

Even if there is discharge coming out of the ear, medical experts agree that antibiotics do not work at all as the pressure on the ear drum has been released and the skin heals up on its own.

There is no good scientific evidence that antibiotics can prevent symptoms from getting worse or protect you from future infections.

In the past doctors assumed that antibiotics were helpful for cold and flu related symptoms. Now doctors have new medical evidence that has shown that antibiotics don't work for these symptoms, so they tend not to prescribe them any more.

Section 15

Frequently Asked Questions on managing my symptoms

**I need to get better quickly and
cannot wait for my symptom(s) to take their natural course**

As ear infections are mostly caused by viruses, recovery even if you take antibiotics cannot be speeded up and may take up to 10 days. However, approximately half of people have such pain for only 4 days. Your immune system is trying to fight off the virus and in doing so your body may need to slow down for a while until it recovers. However, this does not mean that you have to endure the symptoms until they completely settle. The advice given above, based on your symptoms, will help to reduce their impact and help you continue with your everyday life.

Section 15

Frequently Asked Questions on managing my symptoms

**I had a nasty infection in the past and
I want to ensure that I won't go through the same thing again**

Having a bad infection in the past does not make you more vulnerable to future infections. If you feel you are going through something similar to what you had before then the advice given earlier on can help limit the impact of those symptoms on your body. There is no scientific evidence suggesting that other treatments such as antibiotics can prevent symptoms from getting worse or protect you from future infections.

Section 15

Frequently Asked Questions on the treatment prescriptions

Some of the medication suggested contains local anaesthetic, isn't this dangerous?

The dose is so small that it poses no danger – it is just enough to relieve some of the pain and soothe the throat.

Section 15

Frequently Asked Questions on the treatment prescriptions

**I don't really like taking medications,
I feel that they are harmful to the body**

We have not given advice on any medications when there is evidence they can be harmful to the body. The treatment advice earlier on gives details when some medications have side effects or when the evidence is not yet clear. You don't have to take any medications and we have suggested alternative ways of easing your symptoms.

Section 15

Frequently Asked Questions on the treatment prescriptions

**I don't want to take medications,
I prefer the body to fight off the infection naturally**

You don't have to take any medications. The medications are just to ease symptoms and will not cure you. We have suggested alternative ways of easing your symptoms without having to take medications.

Section 15

Frequently Asked Questions on the treatment prescriptions

Is it safe to take Paracetamol and Ibuprofen together?

Yes it is safe, and you can take full doses of both. If you have indigestion, past stomach ulcers or asthma then avoid taking Ibuprofen.

Section 16

Do you have any other symptoms you would like advice about?	
Cough	
Sore throat	
Runny or stuffy nose	
Pain or pressure in the face	

Section 17

Who is providing the advice?

All the information you received today has been put together by health researchers and health care professionals experts in their field at the University of Southampton. The information was based on reliable research evidence drawn from many scientific resources, including these papers:

- 1) Arroll B, Kenealy T(2005) Antibiotics for the common cold and acute purulent rhinitis. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD000247
- 2) De Sutter AIM, Lemiere M, Campbell H. Antihistamines for the common cold. Cochrane Database of Systematic Reviews 2003, Issue 3. Art. No.: CD001267.
- 3) Del Mar CB et al (2006) Antibiotics for sore throat. Cochrane Database of Systematic Reviews, Issue 4, Art. No. CD000023
- 4) Douglas RM, Hemila H., Chalker E, Treacy B (2007). Vitamin C for preventing and treating the common cold. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD000980
- 5) Fahey et al (1998) Quantitative systematic review of randomised controlled trials comparing antibiotic with placebo for acute cough in adults. British Medical Journal, 316: 906-10.
- 6) Fahey et al (2004) Antibiotics for acute bronchitis. Cochrane Database of Systematic Reviews, Issue 4. Art. No.:CD000245
- 7) Hueston WJ (1997) Antibiotics: neither cost effective nor 'cough' effective. Journal of Family Practice, 44:261-5.

Appendix 10 Intervention Materials for Ear-ache

- 8) Shah SA, Sander S, White CM, Rinaldi, M, Coleman CI (2007). Evaluation of Echinacea for the prevention and treatment of common cold: a meta-analysis. *The Lancet Infectious Diseases*, Vol. 7(7): 473-480.
- 9) Schroeder K, Fahey T (2004) Over-the-counter medications for acute cough in children and adults in ambulatory settings. *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: CD001831
- 10) Singh M (2006) Heated, humidified air for the common cold. *Cochrane Database of Systematic Reviews*, Issue 3, Art.No. CD001728
- 11) Taverner D, Latte J (2007) Nasal decongestants for the common cold. *Cochrane Database of Systematic Reviews* 2007, Issue 1. Art. No.: CD001953.
- 12) Verkatesum P, Innes JA (1995) Antibiotic resistance in common acute respiratory pathogens. *Thorax*, 50:418-3.
- 13) Verheij T, Hermans J, Kaptein A, Mulder J (1995) Acute bronchitis: course of symptoms and restrictions in patients daily activities. *Scandinavian Journal of Primary Health Care*, 13:8-12.

Appendix 11 Intervention Materials for Runny-Stuffy nose

Section 1

Your personal cold and flu doctor

Do you:

- ✿ Feel under the weather and unwell?
- ✿ Have a cough or a sore throat?
- ✿ Have a stuffy nose or earache?

➤ **Are you not sure if you need to see the doctor?**

- ④ How can you tell if your symptoms are a sign of an illness that may need medical diagnosis and treatment?

➤ **What can you do to feel better?**

- ④ What is the most effective way to treat your own symptoms so they don't interfere with your daily life?

What you are going to see in the following pages:

The following pages are designed to give you expert advice about your symptoms – you can:

- ✿ Get detailed advice on how to cope with your specific problems, including whether you should see your doctor.
- ✿ Find out the answers to all your questions about your symptoms and their treatment.
- ✿ Check if there is anything more you can do to help your body recover.

Our aim is to provide you with all the information you could get from seeing your doctor, but with the advantage that:

- ✿ You don't have to wait for an appointment – you can consult the website doctor any time, as often as you like.
- ✿ You don't have to travel to the surgery and sit there waiting for your appointment with other unwell people!
- ✿ You can check for further information if your symptoms change.

Who is providing the advice?

A group of doctors, health experts and researchers based at the University of Southampton has put together all the advice and information you will see. The information has been based on scientific and reliable evidence. You can see the references to some of the main sources we used at the end so that you can check these for yourself if you want to.

Section 2

**So that we can give you the right advice,
we need you to tell us about your symptoms:**

You are

here:

Main

Symptom

1. Which symptom is bothering you most? (please tick one only)	
Cough	
Sore throat	
Runny or stuffy nose	
Earache	
Pain or pressure in the face	

Section 3

You are here:

Main Symptom
Runny/stuffy
nose

**Diagnostic
questions**

How long have you had your symptoms for? (please tick one only)	
Less than a week	
Between 1-3 weeks	
More than 3 weeks	

Section 3

Over the last few days have your symptoms got better, worse or stayed much the same? (please tick just one)

My symptoms are getting a little better, but too slowly	
My symptoms are not getting better at all	
My symptoms are steadily getting worse	

Please tick each of the symptoms you may have	Yes	No
Have you had a high fever (a temperature of more than 38.5 °C or 101.3 °F) for at least 3 days?		
Do you have a severe headache, stiff neck and you avoid bright lights even if you have no temperature?		
Do you get short of breath when you are inactive <i>or</i> doing very little, <i>or</i> , is your breathing getting worse than before?		

Section 4

You are here:

Main Symptom
Runny/stuffy
nose
Diagnostic
questions

Your personal diagnosis and advice

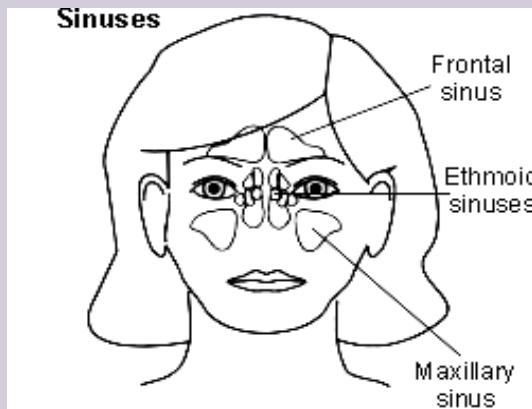
Your personal diagnosis report	
	<p>You should go to see your doctor about these symptoms.</p> <p>This may be because of any of these signs:</p> <ul style="list-style-type: none"> ● You remain very unwell or getting worse for more than a week ● You have had a high temperature (over 38.5 °C or 101.3°F) for more than 3-4 days, ● You have a severe headache, you cannot stand bright lights and have a stiff neck ● You are becoming very short of breath or is getting worse than it used to be <p>These are signs that you need a medical check-up.</p>

Section 4

Your personal diagnosis report

You have symptoms of nasal congestion due to the swelling (or inflammation) of the sinuses and the membrane lining of the nose. As the picture shows, sinuses are the air spaces inside the cheekbones and forehead and the infection can affect any or all three types.

The infection produces increased amounts of mucus or catarrh. The lining of the nose



swells and the airways become narrower and more easily blocked, making it more difficult to breath through the nose. Most people describe it as a feeling of a need to swallow nasal secretions, or 'postnasal drip'.

Did you know?

Catarrh can be a symptom of a range of conditions but is usually associated with the common cold, so you may also have other symptoms such as cough, pain in the face that is worse on one side than the other or a sore throat.

Is it possible my symptoms may be partly due to an allergy?

Sometimes catarrh can be caused or made worse by an allergic reaction to a substance, e.g. grass, weed and tree pollens, house mites or dust. Other common symptoms of an allergic reaction are:

- Sneezing
- Coughing
- Blocked or runny nose
- Itchy throat and eyes

Usually they last longer than a common cold (more than 7 days). They may occur at a certain time of the year (such as in the spring or summer in the case of hay fever) or all year-round. When the body comes into contact with the substance it is allergic to, it triggers the release of chemicals in the body called histamines which cause these symptoms.

Section 5

You are here:

Main Symptom

Runny/stuffy nose

Diagnostic
questions

- Your personal diagnosis and advice
- **When to see the doctor**

Do I need to see the doctor for these symptoms?

Symptoms like these are mostly caused by viruses and can be quite uncomfortable. However, the symptoms you have at present are not a sign of a serious illness that needs to be seen by the doctor.

There are available treatments that provide relief from these symptoms. You do not need a prescription for these so we have provided detailed advice on the following pages. If you have other symptoms as well, such as coughing or itchy throat, you will have the chance at the end of these pages to click for further information and advice.

Are you still unsure when to see your doctor for your symptoms?



More Info

If so, then just click here to see what symptoms mean you should see the doctor.

Section 6

You are here:

Main Symptom

Runny/stuffy nose

Diagnostic
questions

- Your personal diagnosis and advice

-

You should go to see your doctor about your symptoms if:

- You remain very unwell for more than 5-7 days
- You have a long-lasting high temperature (38.5 °C or 101.3°F for at least 3 days)
- You have a severe headache, you cannot stand bright lights and have a stiff neck (even if you have no temperature)
- You are becoming very short of breath when inactive or doing very little, or your breathing is getting worse than it used to be.

Section 7

You are here:

Main Symptom
Runny/stuffy nose

Diagnostic Qs
Your personal
diagnosis and
advice

When to see the
doctor

**When can I get
better?**

When should my symptoms clear up?

GPs find that the patients they see with such symptoms report that on average:

- They feel particularly unwell for the first 5-7 days, after which the symptoms start to settle down
- Usually it takes 2 weeks for the symptoms to completely clear up but sometimes they can take up to 4 weeks.

Did you know?

Sometimes your symptoms may start to clear, or clear completely, and then come back again after a short while.

This can be because the original infection is taking a bit longer to finally settle, but often it means you have had bad luck and caught a new virus. This may then need a few further weeks to clear.

Section 8

You are here:

Main Symptom
Runny/stuffy
nose

Diagnostic Qs
Your personal
diagnosis and
advice

When to see the
doctor

**When can I get
better?**

**Will seeing the
doctor help me
get better more
quickly?**

Will seeing the doctor help my symptoms get better more quickly?

Medical evidence has shown that usually there is nothing that the doctor can do to speed up your recovery from a virus.

The main things the doctor can do are:

- ◆ Make sure there is nothing else more serious going on
- ◆ Give you advice on how to get relief from your symptoms
- ◆ Help your immune system to fight off the infection

We have provided detailed advice on all these things in the following pages so you do not need to wait for an appointment or a prescription.

Section 9**You are here:**

Main Symptom
Runny/stuffy nose
Diagnostic questions

- Your personal diagnosis and advice
- When to see the doctor
- When can I get better?
- Will seeing the doctor help me get better more quickly?

• Can antibiotics help my symptoms?**Would it help to try antibiotics for my symptoms?****In Brief**

The symptoms you currently experience do not need antibiotics to settle down. Medical evidence has shown that antibiotics do not help most people, as symptoms like these are usually caused by viruses and antibiotics do not work against viruses – our immune system is able to fight off the infection



More Info

If you want to find out more about the risks and uses of antibiotics click here

Section 10**More information about the risks and uses of antibiotics**

In the past doctors have prescribed antibiotics thinking that they help. But we know now from recent medical evidence that antibiotics do not help most people who are prescribed them. This is because symptoms like the ones you have are mostly caused by viruses and antibiotics do not work against viruses. Our immune system can fight off the infection.

These studies also show that even when antibiotics are given, they do not improve symptoms and they are likely to cause side effects (such as diarrhoea, rashes, feeling sick) which in rare cases can be very severe (collapse, spasm of the airways).

Why taking antibiotics when not needed can be dangerous

Recent evidence has shown that overusing antibiotics or taking them when not needed (e.g. when our

immune system can fight off the infection itself) can be dangerous.

Doctors realise now that the more antibiotics one uses for common symptoms the easier it gets for the bugs to adapt and find ways to survive the antibiotics. They become '**antibiotic resistant**', so that the antibiotics are becoming less effective at fighting infections and in the future they will no longer work for you. So we need to keep producing new kinds of antibiotics that are stronger but this can be very difficult, takes a lot of time and it is very costly.

Antibiotic resistance is becoming a big problem now as some killer diseases are already resistant to several antibiotics.

This is not just a problem for the person who takes antibiotics when they are not needed; it can also affect people who live close by (for example in the wider community) even if they do not take antibiotics themselves. This is because bugs can easily transfer around people, for example by air when sneezing.

There is also research evidence that antibiotics can reduce your ability to fight infections – this happens in two ways: First, they stop your body mounting the full antibody response. Secondly, they kill good bacteria that we all have in our throats, and which are important in the body's defence against invading bacteria.

Section 11

You are here:

Main Symptom

Runny/stuffy nose

Diagnostic questions

- Your personal diagnosis and advice
- When to see the doctor

- When can I get better?

- Will seeing the doctor help me get better more quickly?

- Can antibiotics help my symptoms?

Do my symptoms suggest something else?

Do you think your symptoms might be a sign of something more serious?



If yes, click here to find out more

Some people think their symptoms may be a sign of a serious condition and want to know more about these illnesses.

We have listed the most common conditions that may be a cause concern for earache. Just tick on any of these if you want to find out more.

Bronchitis

Emphysema and chronic bronchitis

Section 11

Information on other conditions

Bronchitis

This is just the name for an inflammation and irritation of the bronchial tubes in the lungs (at the top of the chest). It often occurs after a cold or flu virus, but can also be caused or made worse by cigarette smoke or air pollution.

The symptoms can include coughing up phlegm, discomfort or tightness in the chest, fatigue, sore throat or runny nose. Green sputum is common and does not mean that the infection is serious, even if it is blood-specked.

Although it is very unpleasant, acute bronchitis (lasting no more than 4 weeks) is not a dangerous condition. As it is mostly caused by viruses, antibiotics have very little effect. People were given antibiotics in the past, but now medical experts agree that the benefits are very slight (on average they reduce the duration of cough by less than 1 day in an illness of 3-4 weeks).

For advice on how to treat the symptoms caused by bronchitis, tick at the options at the end of the runny-stuffy nose webpages.

Section 11

Information on other conditions

Emphysema and chronic bronchitis

Emphysema occurs when the tissue of the lungs is damaged. **Chronic bronchitis** occurs when the bronchial tubes in the lungs (at the top of the chest) become chronically inflamed and results in a cough with phlegm for several months each winter.

In both emphysema and bronchitis, it is more difficult to breathe out fully. It is therefore difficult to walk far or be physically active without getting short of breath. These symptoms persist for months or years.

The most common cause of emphysema and chronic bronchitis is smoking and heavy smokers are most at risk. If you think your symptoms match these then contact your GP.

Section 12

You are here:

Main Symptom
Runny/stuffy nose
Diagnostic
questions

Advice on
relieving your
symptoms

- Things you can do yourself

Advice on relieving your symptoms

We have put together several advice suggestions based on medical evidence and what has been found useful by people with similar symptoms.

Tick the advice you want to see (you can tick more than one)

Things you can do yourself

Things you can get from your chemist

Things you can do yourself

- Other people with these symptoms report that steam inhalation can ease their symptoms as this opens the airways, softens the catarrh and lets it drain into the back of the throat. There is some evidence to show this might be helpful for some people, although more and larger studies are needed to be sure. You can inhale steam for 5 minutes 3 times a day: fill half of a two pint bowl with boiling water and put a towel over your head and breathe in the hot steam or inhale through a gap in your hands. Oils for inhalation can also be used such as eucalyptus and menthol. Some products come as vapour rubs to be applied to the chest or back. Taking hot showers or having an electric vaporiser in the bedroom may also help.
- If your nose is red and raw from rubbing with tissues, put a bit of petroleum jelly or vaseline on the sore area. There are also special tissues, which contain balm that can soothe the nose and help prevent redness; they are available from pharmacies and supermarkets.

In case your symptoms are due to an allergic reaction, discovering the source and avoiding that substance is the best treatment. Keeping a record of your symptoms when they occur (e.g. if seasonal or if they persist all year-around) is a good way of identifying what may trigger them.

- Drinking plenty of fluids (water, fruit juice, squash, honey and lemon) will help relieve congestion by keeping mucus thin and draining. This is because our immune system is overworking to fight off the infection and needs plenty of fluids to function properly especially if you have fever as well as this increases the risk of dehydration.

- Painkillers such as Paracetamol and Ibuprofen help in controlling your pain and lower your fever. Approximately half of the people with asthma need to avoid taking Ibuprofen and aspirin as they can make breathing more difficult. However, if you have taken them in the past and not experienced any side effects then you can continue taking them.
- Avoid smoking or smoky atmospheres

Section 12

You are here:

Main Symptom
Runny/Stuffy nose
Diagnostic questions

Advice on relieving your symptoms

- Things you can do yourself
- Things you can ask your chemist

Advice on relieving your symptoms

Things you can ask your chemist

- Decongestant nasal sprays or drops containing ingredients such as pseudoephedrine or oxymetazoline, may briefly relieve a blocked nose and help with the breathing by reducing the swelling inside your nose. They are also available as tablets or in liquid form taken by mouth. Recent evidence has shown that repeated use of oral pseudoephedrine over a short period of time (i.e. 3-5 days) can moderately relieve the symptoms. However, you should not use them for more than 7 days continuously as your nose may become more sensitive than before using the product (also known as the 'rebound effect').
- Saline nasal drops or sprays keep nasal tissues moist so they can filter the air and do not make your nose more sensitive. They are available from pharmacies or they can be easily made at home: mix a quarter of teaspoon of salt in 250ml body temperature water (a full glass). Place the solution in a clean bottle with a dropper and use as necessary; make a fresh solution every day. To insert the drops, lie on your back with your head hanging over the side of the bed. This helps the drops get further back.
- Antihistamine drugs can dry up the mucus and relieve allergic reactions (also known as allergic rhinitis) such as runny and stuffy nose, sneezing and nasal irritations. They are taken by mouth and contain ingredients such as loratadine and cetirizine hydrochloride.
- Zinc with vitamin C is commonly used to fight viruses. However, a review of 30 studies, involving a total of 11350 people, showed that taking vitamin C daily can only reduce the duration and severity of colds very slightly (up to 8%). The review has also shown that if you are under great physical or cold stress such as marathon runners and skiers then vitamin C can be more effective (reduction up to 50%).
- We are not sure yet whether start taking vitamin C or increasing the dose at the beginning of a cold might have any useful effect, more research is needed to be sure.

Section 12 (continued)

Natural remedies

- ✿ Echinacea (a herb) can help reduce the duration of cold infections by 1.4 days, as a recent review of 14 studies has shown. This review, involving over 1600 people, also showed that Echinacea reduces the chance of getting a cold by over 55%. However, it was not clear from those studies how much Echinacea people need to take and for how long before they see the benefits, more research is needed to be sure. You can get Echinacea from most chemists, supermarket pharmacies, or health food shops.

Section 13

You are here:

Some people who have similar symptoms experience related problems – here are the most common ones:

Do you have any of these problems? (you may tick more than one)

Main Symptom
Runny/Stuffy nose
Diagnostic questions

Advice on relieving your symptoms

Other related problems

Loss of smell and taste?	Yes	No
Feeling weak and tired?	Yes	No
Being unable to sleep properly?	Yes	No
Headache?	Yes	No
Experiencing slight shortness of breath when you are physically active, e.g. walking, doing housework?	Yes	No

Section 13

You are here:

Main Symptom
Runny/Stuffy nose
Diagnostic questions
Advice on relieving
your symptoms

Other related problems

- **Reduced smell
or taste**

What you can do if you have reduced smell or taste

Reduced or loss of smell and taste usually happens because the inner linings of the nose are swollen. Steam inhalation or using Sudafed can help reducing the nasal swelling and secretion. It can last between 2-3 weeks and there is no evidence for long-term effect or damage to the sense of smell or taste.

Section 13

You are here:

Main Symptom
Runny/Stuffy nose
Diagnostic questions
Advice on relieving
your symptoms

Other related problems

- Reduced smell or taste
- **Feeling weak and tired**

You are here:

Main Symptom
Runny/Stuffy nose

Other related problems

- Reduced smell or taste
- **Feeling weak and tired**
- **Unable to sleep properly**

What you can do if you feel weak and tired

As your body uses a lot of energy to fight off the cold virus you tend to **feel weak and tired**

- You can take paracetamol or ibuprofen to reduce general pains and aches
- See also Advice on helping your immune system later on for further useful suggestions.

What you can do if you can not sleep properly

Sleeping can be affected either due to the blocked airways or the persistent coughing caused by excess mucus at the back of the throat.

There are no good studies which show clearly what can help but some people find the following helpful:

- Steam inhalations can also be soothing
- Paracetamol can help with the pain
- Other people with **congested airways** find that taking linctuses or tablets containing antihistamines or decongestants can help. Antihistamines or decongestants help by easing off the fluids and reducing the mucus. Some antihistamines cause drowsiness, and others that are less likely to make you sleepy. If you are using any of these for the first time they may cause some drowsiness, so it is useful to take them at bedtime if your symptoms keep you awake at night.
- Sleep with your head on high pillow(s) to help with the breathing.

Section 13

You are here:

Main Symptom

Runny/Stuffy nose

Other related problems

- Reduced smell or taste
- Feeling weak and tired
- Unable to sleep properly
- **Headache**

What you can do if you have a headache

A **headache** is a common problem when you have symptoms like catarrh.

Try simple painkillers such as paracetamol or ibuprofen which can help ease the pain. If you are have pains in the forehead and face, see at the end of these webpages how to get further advice on those symptoms.

You are here:

Main Symptom

Runny/Stuffy nose

Other related problems

- Reduced smell or taste
- Feeling weak and tired
- Unable to sleep properly
- Headache
- **Slight shortness of breath**

What you can do if you have slight shortness of breath

Having a **slight shortness of breath** when being little or no physically active could be a sign that your infection is becoming chesty. This can affect any or all of the breathing passages which link together the nose, the throat, the mouth and lungs. Other concurrent symptoms are persistent **chesty cough**, which is the most common one, and/or **coughing up phlegm**. You will have the see other web-pages for further advice on those symptoms later on.

Section 14

You are here:

Main Symptom
Runny/Stuffy nose
Diagnostic questions
Advice on relieving
your symptoms
Other related
problems

What else can I do?

<p style="text-align: center;">What else you can do Advice on helping your immune system fight the infection</p>	
	<p>The advice given earlier can help this natural process but there are also a few other things you could do that can help to reduce the impact of your symptoms on your daily activities.</p>
	<p>Look after yourself physically and mentally by:</p> <ul style="list-style-type: none"> ✓ Eating a healthy, balanced diet containing plenty of fruit and vegetables. The body needs a good supply of nutrients to fight off the infection. ✓ Get extra rest after work; slow down just a little from your usual routine. It is not necessary to stay at home in bed but listen to your body if it needs more rest: maybe this would be a good opportunity to watch TV or a nice film, read a magazine or a book, or just relax. ✓ Keep warm but try not to let the room get stuffy, as a little fresh air may help you to feel better. ✓ Medical evidence shows that stress can significantly reduce the ability of the immune system to fight off infections. Therefore, trying to reduce some of the stress from daily life can have a significant positive impact on your mental and physical health, and help your immune system even further to fight off the infection.

Section 15

You are here:

Main Symptom
Runny/Stuffy
nose
Diagnostic
questions
Advice on
relieving your
symptoms
Other related
problems
What else can I
do?

<p style="text-align: center;">Do you have any concerns about managing your symptoms overall or about your treatment?</p> <p style="text-align: center;">Frequently Asked Questions</p>	
	We have put together information about common questions and concerns. Just tick each one you feel applies to you for more advice on those points.
I'm not sure if I'm doing the right thing	
I tried everything and I'm still unwell, I don't think there is anything else I can do	
Only antibiotics work for me when my symptoms are bad - without them I will not get better and may get worse	

Appendix 11 Intervention Materials for Runny-Stuffy nose

I need to get better quickly and cannot wait for my symptom(s) to take their natural course	
I had a nasty infection in the past and I want to ensure that I won't go through the same thing again	
Some of the medication suggested contains local anaesthetic, isn't this dangerous?	
I don't really like taking medications, I feel that they are harmful to the body	
I don't want to take medications, I prefer the body to fight off the infection naturally	
Is it safe to take Paracetamol and Ibuprofen together?	
Having to take decongestants worries me as I've heard they increase the blood pressure	
Is it better to take all-in-one treatments or individual remedies for each individual symptom?	

Section 15

Frequently Asked Questions on managing my symptoms

I'm not sure if I'm doing the right thing

Although runny or stuffy nose and its other symptoms can make you feel very uncomfortable they seldom lead to more serious complications, so you do not need to worry about these symptoms. If you experience symptoms you have never had before or which are worse than you have had in the past then you may worry that these symptoms are a sign of a serious illness. However, medical experts agree that you do not need to worry even if the symptoms take 4-6 weeks to completely clear off as long as you start to get better after you had these symptoms for a week.

Section 15

***Frequently Asked Questions* on managing my symptoms**

**I tried everything and I'm still unwell,
I don't think there is anything else I can do**

The various things you are already doing may relieve your symptoms but will not shorten their duration. These symptoms can take quite a while to clear away completely and for a small number of people (5-10%) this can take up to 4-6 weeks. This is might be because the linings of the nose are more sensitive and need more time to recover. Sometimes people are just unlucky enough to get another virus before completely recovering from the previous infection.

In either case, the doctor can do nothing really unless there is a change of symptoms i.e. getting much worse.

Prescribed medication such as antibiotics can do very little to speed up recovery. The advice given earlier on, based on your symptoms, will help to reduce the impact of your symptoms and enable you to get on with your everyday life. Try some of the advice suggestions given earlier on if you have not already done so, and come back to this website in 2-3 days time to check the progress of your symptoms.

Section 15

***Frequently Asked Questions* on managing my symptoms**

**Only antibiotics work for me when my symptoms are bad –
without them I will not get better and may get worse**

Most common infections and symptoms such as the ones you experience now are caused by viruses, but antibiotics are only effective for some infections caused by bacteria. You may have taken antibiotics in the past and felt well soon after that. This is usually due to the natural course of the symptoms – most people visit their doctor when they have had their symptoms for some time and by then the immune system has started to fight back the viruses on its own, so people are about to get better naturally anyway.

In the past doctors assumed that antibiotics were helpful for cold and flu related symptoms. Now doctors have new medical evidence that has shown that antibiotics don't work for these symptoms,

so they tend not to prescribe them anymore.

There is no good scientific evidence that antibiotics can prevent symptoms from getting worse or protect you from future infections.

There is also evidence from studies that antibiotics can reduce your ability to fight infections – this happens in two ways. Antibiotics stop your body mounting the full antibody response. They also kill good bacteria that we all have in our throats, and which are important in the body's defence against invading bacteria.

Section 15

Frequently Asked Questions on managing my symptoms

I need to get better quickly and cannot wait for my symptom(s) to take their natural course

As these symptoms are mostly caused by viruses, recovery even with antibiotics cannot be speeded up and may take up to 4-6 weeks although most people only feel unwell for 7-14 days. Your immune system is trying to fight off the virus and in doing so your body may need to slow down for a while until it recovers. However, this does not mean that you have to endure the symptoms until they completely settle. The advice given above, based on your symptoms, will help to reduce their impact and help you continue with your everyday life.

Section 15

Frequently Asked Questions on managing my symptoms

I had a nasty infection in the past and I want to ensure that I won't go through the same thing again

Having a bad infection in the past does not necessarily make you more vulnerable to future infections. If you feel you are coming down with something similar to what you had before then the advice given earlier on can help limit the impact of those symptoms on your body.

There is no strong scientific evidence suggesting that other treatments such as antibiotics can prevent symptoms from getting worse or protect you from future infections.

Section 15

Frequently Asked Questions on the treatment prescriptions

Some of the medication suggested contains local anaesthetic, isn't this dangerous?

The dose is so small that it poses no danger – it is just enough to relieve some of the pain and soothe the throat.

Section 15

Frequently Asked Questions on managing my symptoms

**I don't really like taking medications,
I feel that they are harmful to the body**

We have not given advice on any medications when there is evidence they can be harmful to the body. The treatment advice earlier on gives details when some medications have side effects or when the evidence is not yet clear. You don't have to take any medications and we have suggested alternative ways of easing your symptoms.

Section 15

Frequently Asked Questions on managing my symptoms

**I don't want to take medications,
I prefer the body to fight off the infection naturally**

You don't have to take any medications. The medications are just to ease symptoms and will not cure you. We have suggested alternative ways of easing your symptoms without having to take medications.

Section 15

***Frequently Asked Questions* on managing my symptoms**

Is it safe to take Paracetamol and Ibuprofen together?

Yes it is safe, and you can take full doses of both. If you have indigestion, past stomach ulcers or asthma then avoid taking Ibuprofen.

Section 15

***Frequently Asked Questions* on managing my symptoms**

Having to take decongestants worries me as I've heard they increase the blood pressure

There is no good evidence of any harmful effect. If you take decongestants containing pseudoephedrine there might be a small negative effect on blood pressure in the short term.

Therefore, if you have high blood pressure that you know is not well controlled but want to take something, you could avoid taking mixtures containing pseudoephedrine. However, more studies need to be done to know for sure.

Section 15

***Frequently Asked Questions* on managing my symptoms**

Is it better to take all-in-one treatments or individual remedies for each symptom?

Some people find an all-in-one remedy convenient so that all of the symptoms can be treated together. These products usually contain a painkiller to ease aches and pains and lower body temperature, as well as a decongestant to unblock the nose.

Others prefer to treat each symptom individually so you do not have to take all of the ingredients in the all-in-one remedies. There is no research showing these products to be superior to the individual ones.

If you are thinking of choosing an all-in-one remedy, it is important to identify the symptoms that you wish to relieve, e.g. Do you need a painkiller?/ Is your nose blocked?/ Do you require a product

that will not make you drowsy?

Answering these questions will help you decide whether an all-in-one remedy is more appropriate than the use of individual products.

Section 16

Do you have any other symptoms you would like advice about?

Cough

Sore throat

Runny or stuffy nose

Pain or pressure in the face

Section 17

Who is providing the advice?

All the information you received today has been put together by health researchers and health care professionals experts in their field at the University of Southampton. The information was based on reliable research evidence drawn from many scientific resources, including these papers:

- 1) Arroll B, Kenealy T(2005) Antibiotics for the common cold and acute purulent rhinitis. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD000247
- 2) De Sutter AIM, Lemiengre M, Campbell H. Antihistamines for the common cold. Cochrane Database of Systematic Reviews 2003, Issue 3. Art. No.: CD001267.
- 3) Del Mar CB et al (2006) Antibiotics for sore throat. Cochrane Database of Systematic Reviews, Issue 4, Art. No. CD000023
- 4) Douglas RM, Hemila H., Chalker E, Treacy B (2007). Vitamin C for preventing and treating the common cold. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD000980

Appendix 11 Intervention Materials for Runny-Stuffy nose

- 5) Fahey et al (1998) Quantitative systematic review of randomised controlled trials comparing antibiotic with placebo for acute cough in adults. *British Medical Journal*, 316: 906-10.
- 6) Fahey et al (2004) Antibiotics for acute bronchitis. *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.:CD000245
- 7) Hueston WJ (1997) Antibiotics: neither cost effective nor 'cough' effective. *Journal of Family Practice*, 44:261-5.
- 8) Shah SA, Sander S, White CM, Rinaldi, M, Coleman CI (2007). Evaluation of Echinacea for the prevention and treatment of common cold: a meta-analysis. *The Lancet Infectious Diseases*, Vol. 7(7): 473-480.
- 9) Schroeder K, Fahey T (2004) Over-the-counter medications for acute cough in children and adults in ambulatory settings. *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: CD001831
- 10) Singh M (2006) Heated, humidified air for the common cold. *Cochrane Database of Systematic Reviews*, Issue 3, Art.No. CD001728
- 11) Taverner D, Latte J (2007) Nasal decongestants for the common cold. *Cochrane Database of Systematic Reviews* 2007, Issue 1. Art. No.: CD001953.
- 12) Verkatesum P, Innes JA (1995) Antibiotic resistance in common acute respiratory pathogens. *Thorax*, 50:418-3.
- 13) Verheij T, Hermans J, Kaptein A, Mulder J (1995) Acute bronchitis: course of symptoms and restrictions in patients daily activities. *Scandinavian Journal of Primary Health Care*, 13:8-12.

Appendix 12 Intervention Materials for Sinusitis

Section 1

<p style="text-align: center;">Your personal cold and flu doctor</p>	
<p>Do you:</p> <ul style="list-style-type: none">● Feel under the weather and unwell?● Have a cough or a sore throat?● Have a stuffy nose or earache? <p>➤ Are you not sure if you need to see the doctor?</p> <ul style="list-style-type: none">● How can you tell if your symptoms are a sign of an illness that may need medical diagnosis and treatment? <p>➤ What can you do to feel better?</p> <p>What is the most effective way to treat your own symptoms so they don't interfere with your daily life?</p>	
<p style="text-align: center;">What you are going to see in the following pages:</p> <p>The following pages are designed to give you expert advice about your symptoms – you can:</p>	
<ul style="list-style-type: none">● Get detailed advice on how to cope with your specific problems, including whether you should see your doctor.● Find out the answers to all your questions about your symptoms and their treatment.● Check if there is anything more you can do to help your body recover.	
<p>Our aim is to provide you with all the information you could get from seeing your doctor, but with the advantage that:</p>	
<ul style="list-style-type: none">● You don't have to wait for an appointment – you can consult the website doctor any time, as often as you like● You don't have to travel to the surgery and sit there waiting for your appointment with other unwell people!● You can check for further information if your symptoms change	
<p>Who is providing the advice?</p> <p>A group of doctors, health experts and researchers based at the University of Southampton has put together all the advice and information you will see. The information has been based on scientific and reliable evidence. You can see the references to some of the main sources we used at the end so that you can check these for yourself if you want to.</p>	

Section 2

**So that we can give you the right advice,
we need you to tell us about your symptoms:**

You are**here:****Main****Symptom****Which symptom is bothering you most?**

(please tick one only)

Cough

Sore throat

Runny or stuffy nose

Earache

Pain or pressure in the face

Section 3**You are****here:**

Main

Symptom

Pain or

pressure in
the face**Diagnostic
questions****Do you have pain that is worse on one side of the face than the
other? (please tick one only)**

Yes

No

How long have you had this pain for? (please tick one only)

Less than a week

Between 1-3 weeks

More than 3 weeks

Over the last week has this pain been: (please tick one only)

Getting a little better, but too slowly

Not getting better at all

Getting steadily getting worse

You are here:

Main Symptom
Pain or
pressure in the
face

**Diagnostic
questions**

Do you have thick or discoloured discharge from the nose that is worse on one side rather than the other? (please tick one only)

Yes

No

Have you recently had a cold that improved initially but now is it getting much worse again? (please tick one only)

Yes

No

Please tick each of the symptoms you may have

Yes

No

Do you get short of breath when you are inactive *or* doing very little,
or is your breathing getting worse than before?

Have you had a high fever (a temperature of more than 38.5 °C or
101.3 °F) for at least 3 days?

Do you have a severe headache, stiff neck and you avoid bright lights
even if you have no temperature?

Section 4

You are here:

Main Symptom

Pain or
pressure in the
face

Diagnostic
questions

**Your personal
diagnosis and
advice**

Your personal diagnosis report

You should go to see your doctor about this pain

This may be because of any of these signs:

- Your symptoms are not starting to improve even after 1 week or have continued for more than 3-4 weeks**
- You have a severe headache, you cannot stand bright lights and have a stiff neck (even if you have no temperature)**
- You are becoming very short of breath or your breathing is getting worse than it used to be**
- You have had a high temperature (over 38.5°C or 101.3 °F) for more than 3 days**
- You have noted unusual swelling or tenderness around the eyes or eyebrows**
- You feel very unwell**

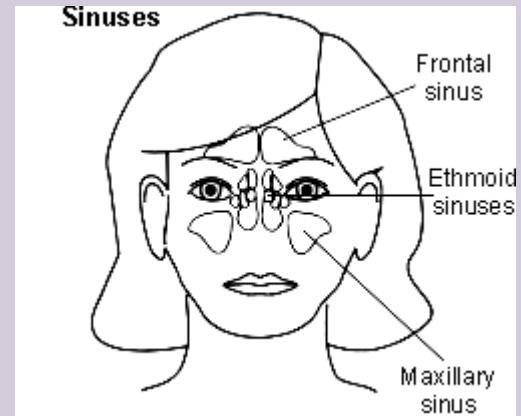
These are signs that you need a medical check-up.

Section 4

Your personal diagnosis report

These are symptoms of an infection of the sinuses. As the picture shows, sinuses are the air spaces inside the cheekbones and forehead and the infection can affect any or all three types. This infection is also known as sinusitis and it follows on from a cold or other infection which affects the nose.

Because the lining of the nose is connected to the lining of the sinuses, your sinuses become inflamed and swollen every time you have a cold. This swelling then causes pain in your face usually below or sometimes above your eyes and next to the nose.



Did you know?

The symptoms often start just as you think you are getting better from an infection.

The congested sinus can be more painful and feel tenderer when you move your head or bend forwards, or you may get pain in your jaw when you eat. These are signs that your body is fighting the infection. You may also have a sore throat, a cough, headache or fever as well as feeling generally unwell, tired and low. If you have any of these symptoms as well, you can click to get advice on how to treat them at the end of these webpages on sinusitis.

Is it possible my symptoms may be partly due to an allergy?

Sometimes sinusitis can be caused or made worse by an allergic reaction to a substance, e.g. grass, weed and tree pollens, house mites or dust. Other common symptoms of an allergic reaction are:

- Sneezing
- Coughing
- Blocked or runny nose
- Itchy throat and eyes

Usually they last longer than a common cold (more than 7 days). They may occur at a certain time of the year (such as in the spring or summer in the case of hay fever) or all year-round. When the body comes into contact with the substance it is allergic to, it triggers the release of chemicals in the body called histamines which cause these symptoms.

Section 5**You are here:**

Main Symptom

Pain or
pressure in the
faceDiagnostic
questions

- Your personal diagnosis and advice

- **When to see the doctor**

Do I need to see the doctor for these symptoms?

Symptoms like these are caused by viruses and can be painful and make you feel very uncomfortable for some time. However, the symptoms you have at present are not a sign of a serious illness that needs to be seen by the doctor.

There are available treatments that provide relief from these symptoms. You do not need a prescription for such treatments so we have provided detailed advice on the following pages.

Are you still unsure when to see your doctor for your symptoms?

If so, then just click here to see what symptoms mean you should see the doctor.

Section 6**You are here:**

Main Symptom

Pain or
pressure in the
face

Diagnostic

questions

- Your personal diagnosis and advice

- **When to see the doctor**

You should go to see your doctor about your sinusitis if:

- It lasted more than 1 week without getting any better
- You have pain in the forehead or around the eyes which is getting worse after 5 days
- You have had a high temperature (38.5 °C or 101.3°F) for more than 3 days
- You have a severe headache that is not relieved by pain killers, you cannot stand bright lights and have a stiff neck (even if you have no temperature)

Section 8**You are here:****Main Symptom**

Pain or pressure
in the face

**Diagnostic
questions**

- Your personal diagnosis and advice
- When to see the doctor
- **Will seeing the doctor help me get better more quickly?**

Will seeing the doctor make me feel better more quickly?

Medical evidence shows that there is usually nothing that the doctor can do to speed up your recovery from a virus or an allergic reaction. The symptoms can be painful and make you feel quite unwell as they can take a few days before settling down and a few weeks before they completely clear out.

The main things the doctor can do are:

- ✿ Make sure there is nothing else more serious going on
- ✿ Give you advice on how to get relief from your symptoms
- ✿ Help your immune system to fight off the infection

We have provided detailed advice on all these things in the following pages so you do not need to wait for an appointment or a prescription.

Section 9**You are here:****Main Symptom**

Pain or pressure in the
face

Diagnostic questions

- Your personal diagnosis and advice
- When to see the doctor
- Will seeing the doctor help me get better more quickly?
-

Would it help to try antibiotics for my symptoms?**In brief**

Medical evidence has shown that antibiotics do not help most people, as symptoms like these are usually caused by viruses and antibiotics do not work against viruses - our immune system is able to fight off the infection.

Antibiotics can reduce symptoms by less than 1 day in an illness that can last up to 4 weeks. They can cause side effects, and the more antibiotics one uses, the more 'resistant' the bugs become and they survive longer.

More Info

If you want to find out more about the
risks and uses of antibiotics click here



Section 10**More information about the risks
and uses of antibiotics**

In the past doctors have prescribed antibiotics thinking that they help. But we know now from recent medical evidence that antibiotics do not help the vast majority of people.

There is some evidence that antibiotics on average may help to reduce the number of days you will have sinusitis for by less than 1 day in an illness that can last up to 4 weeks. But studies have also shown that antibiotics can cause side effects (such as diarrhoea, rashes, feeling sick) which in some rare cases they can be very severe (for example: collapse, spasm of the airways).

Most common infections of the nose, throat, ears and chest are caused by viruses, and evidence shows antibiotics don't work against viruses – our immune system is able to fight off the infection.

Why taking antibiotics when not needed can be dangerous

Recent evidence has shown that overusing antibiotics or taking them when not needed (e.g. when our immune system can fight off the infection itself) can be dangerous. Doctors realise now that the more antibiotics one uses for common symptoms the easier it gets for the bugs to adapt and find ways to survive the antibiotics. They become '**antibiotic resistant**', so that the antibiotics are becoming less effective at fighting infections and in the future they will no longer work for you. So we need to keep producing new kinds of antibiotics that are stronger but this can be very difficult, takes a lot of time and it is very costly.

Antibiotic resistance is becoming a big problem now as some killer diseases are already resistant to several antibiotics.

This is not just a problem for the person who takes antibiotics when they are not needed; it can also affect people who live close by (for example in the wider community) even if they do not take antibiotics themselves. This is because bugs can easily transfer around people, for example by air when sneezing.

There is also research evidence that antibiotics can reduce your ability to fight infections – this happens in two ways: First, they stop your body mounting the full antibody response. Secondly, they kill good bacteria that we all have in our throats, and which are important in the bodies defence against invading bacteria.

Section 11**You are here:**

Main Symptom
Pain or pressure in
the face

Diagnostic
questions

- Your personal diagnosis and advice
- When to see the doctor
- Will seeing the doctor help me get better more quickly?
- Can antibiotics help my symptoms?
- Do my symptoms suggest something else?

Do you think your symptoms might be a sign of something more serious?



If Yes, click here to find out more

Some people think their symptoms may be a sign of a serious condition and want to know more about these illnesses.

Meningitis is the most common condition that may be a cause of concern for their symptoms of pain or pressure in the face. Click below if you want to find out more about meningitis.

Meningitis

Section 11**Information on other conditions****Meningitis**

This is an infection of the membranes that cover the brain and the spinal cord. Meningitis can be caused by bacteria or viruses. There are two types: *viral meningitis* is the more common form of the disease but is normally less severe. *Bacterial meningitis* is a less common but more serious form of the disease.

The typical symptoms are:

- Constant generalised headache
- Confusion
- Drowsiness
- Sensitivity to bright lights, daylight or even the television
- High temperature, although hands and feet may be cold
- Neck stiffness - moving the chin to the chest will be painful at the back of the neck
- Vomiting
- Rapid breathing
- A purple rash that does not fade when you press a glass against it

You may also get other symptoms such as stomach pain, diarrhoea, joint and muscle pains.

If you have these symptoms contact your GP right away.

Section 12

You are here:

Main Symptom

Pain or pressure
in the face

Diagnostic
questions

**Advice on
relieving your
symptoms**

- **Things you
can do
yourself**

Advice on relieving your sinusitis

We have put together several advice suggestions based on medical evidence and what has been found useful by people with similar symptoms.

Tick the advice you want to see

(you can tick more than one)

Things you can do yourself

Things you can get from your chemist

Things you can do yourself

- Some people find steam inhalation helpful to ease the symptoms as this opens the airways and thins the mucus. There is some evidence from clinical trials to show this might be helpful, although more and larger studies are needed to be sure. You can inhale steam for 5 minutes 3 times a day: fill half of a sturdy two pint bowl with boiling water and put a towel over your head and breathe in the hot steam or inhale through a gap in your hands. Taking hot showers may also help.
- Drink plenty of fluids (water, fruit juice, squash, honey and lemon) to help keep mucus thin and draining. Fluids can also help our immune system to fight off the infection because it needs plenty of fluids to function properly. Taking more fluids reduces the risk of dehydration, especially if you have fever too.
- Painkillers such as Paracetamol and Ibuprofen help in controlling your pain and lower your fever. Approximately half of the people with asthma need to avoid taking Ibuprofen and aspirin as they can make breathing more difficult. However, if you have taken them in the past and not experienced any side effects then you can continue taking them.
- Avoid smoking or smoky atmospheres

Section 12**You are here:****Main Symptom****Pain or pressure in the face****Diagnostic questions****Advice on relieving your symptoms**

- **Things you can do yourself**
- **Things you can ask your chemist**

Advice on relieving your sinusitis**Things you can ask your chemist**

- ✿ Some people find that tablets or syrups from the pharmacy containing antihistamines may be helpful, especially for runny nose. But there has not been enough good research on how well they work. Antihistamines can dry up the mucus and relieve allergic reactions such as sneezing and nasal irritation but not a blocked nose (see below). They are taken by mouth and contain ingredients such as acrivastine and cetirizine.
- ✿ Decongestant nasal sprays or drops containing pseudoephedrine or oxymetazoline, available from pharmacies, may briefly relieve a blocked nose and help with the breathing by reducing the swelling inside your nose. They are also available as tablets or in liquid form taken by mouth. There is no clear evidence yet if they work or not; some people get side effects (e.g. nausea, headaches) whereas others find them helpful in managing their symptoms. They probably do not shorten the duration of symptoms, and you should not use them for more than 7 days continuously as your nose may become more sensitive than before using the product (also known as the 'rebound effect').
- ✿ Echinacea (a herb) can help reduce the duration of cold infections by 1.4 days, as a recent review of 14 studies has shown. This review, involving over 1600 people, also showed that Echinacea reduces the chance of getting a cold by over 55%. However, it was not clear from those studies how much Echinacea people need to take and for how long before they see the benefits, more research is needed to be sure. You can get Echinacea from most chemists, supermarket pharmacies, or health food shops.
- ✿ Zinc with vitamin C is commonly used to fight viruses. However, a review of 30 studies, involving a total of 11350 people, showed that taking vitamin C **daily** can only reduce the duration and severity of colds very slightly (up to 8%). The review has also shown that if you are under great physical or cold stress such as doing marathon running or being a skier, then vitamin C can be more effective (reduction up to 50%). We are not sure yet whether start taking vitamin C or increasing the dose at the beginning of a cold might have any useful effect, more research is needed to be sure.

Section 13**You are here:**

Main Symptom:
Pain or pressure in the face

Diagnostic questions

Advice on relieving your symptoms

- Things you can do yourself
- Things you can ask your chemist

Some people with sinusitis experience related problems- here are the most common ones:

**Do you have any of these?
(you may tick more than one)**

Reduced smell or taste?	Yes	No
Feeling weak and tired?	Yes	No
Being unable to sleep properly?	Yes	No
Headache?	Yes	No

Section 13**You are here:**

Main Symptom:
Pain or pressure in the face

Diagnostic questions

Advice on relieving your symptoms

What you can do if you have loss of smell or taste

Loss of smell and taste usually happens because the inner linings of the nose are swollen and the subsequent blockage. Steam inhalation or using Sudafed can help reducing the nasal swelling and secretion. It can last between 2-3 weeks and there is no evidence of any long-term effect or damage the smell and taste senses. If it lasts longer than this, then see your doctor.

Section 13**You are here:**

Main Symptom
Pain or pressure in the face
Diagnostic questions
Advice on relieving your symptoms

Other related problems

- Loss of smell or taste
- **Feeling weak and tired**

What you can do when feeling weak and tired

As your body uses a lot of energy to fight off the infection and the discomfort due to the pain, these can make you **feel weak and tired**

- You can take paracetamol or ibuprofen to reduce general pains and aches.
- See also **Advice on helping your immune system** later on for further useful suggestions.

Section 13**You are here:**

Main Symptom
Pain or pressure in the face
Diagnostic questions
Advice on relieving your symptoms

Other related problems

- Loss of smell or taste
- Feeling weak and tired
- **Unable to sleep properly**

What you can do if you can not sleep properly:

Your **sleep may be affected** by the blocked sinuses. There are no good studies which show clearly what can help but some people find the following helpful:

- Paracetamol can help ease the pain
- Steam inhalations before going to bed can also be soothing
- Other people with congested airways find that taking linctuses or tablets containing antihistamines or decongestants (for example pseudoephedrine or phenylpropanolamine) can help by easing off the fluids and reducing the mucus. There are some types of antihistamines that tend to cause drowsiness and others are less likely to make you sleepy. If you are using any of these for the first time they may cause some drowsiness, so it is useful to take them at bedtime.
- Sleep with your head on high pillows to help with the breathing.

Section 13**You are here:**

Main Symptom
Pain or pressure in the face
Diagnostic questions
Advice on relieving your symptoms

Other related problems

- Loss of smell or taste
- Feeling weak and tired
- Unable to sleep properly
- **Headache**

What you can do if you have a headache

A **headache** is a common problem when you have sinusitis and can really wear you down. Try simple painkillers such as paracetamol or ibuprofen which can help ease the pain.

Section 14

**You are
here:**

Main
Symptom
Pain or
pressure in
the face
Diagnostic
questions
Advice on
relieving your
symptoms
Other related
problems
**What else
can I do?**

What else you can do	
Advice on helping your immune system fight the infection	
	<p>The advice given earlier can help this natural process but there are also a few other things you could do that can help to reduce the impact of your symptoms on your daily activities.</p> <p>Look after yourself physically and mentally by:</p> <ul style="list-style-type: none"> ✓ Eating a healthy, balanced diet containing plenty of fruit and vegetables. The body needs a good supply of nutrients to fight off the infection. ✓ Keep warm but try not to let the room get stuffy, as a little fresh air may help you to feel better. ✓ Keeping a window slight open helps to lower the room temperature as well. The reduced temperature increases the humidity in the room and that helps to ease the blocked sinuses. ✓ Central heating can make a blocked nose even worse so taking a short walk can help ease the symptoms. ✓ Get extra rest after work; slow down just a little from your usual routine. It is not necessary to stay at home in bed but listen to your body if it needs more rest: maybe this would be a good opportunity to watch TV or a nice film, read a magazine or a book, or just relax. ✓ Medical evidence shows that stress can significantly reduce the ability of the immune system to fight off infections. Therefore, trying to reduce some of the stress from daily life can have a significant positive impact on your mental and physical health, and help your immune system even further to fight off the infection.

Section 15

You are here:	<p style="text-align: center;">Do you have any concerns about managing your symptoms overall or about your treatment?</p>
Main Symptom Pain or pressure in the face Diagnostic questions Advice on relieving your symptoms Other related problems What else can I do?	<p style="text-align: center;">Frequently Asked Questions</p> <p>We have put together information about common questions and concerns. Just tick each one you feel applies to you for more advice on those points.</p>
	<p>I'm not sure if I'm doing the right thing</p>
	<p>I tried everything and I'm still unwell, I don't think there is anything else I can do</p>
	<p>Only antibiotics work for me when my symptoms are bad - without them I will not get better and may get worse</p>
	<p>I need to get better quickly and cannot wait for my symptom(s) to take their natural course</p>
	<p>I had a nasty infection in the past and I want to ensure that I won't go through the same thing again</p>
	<p>Is it safe to take Paracetamol and Ibuprofen together?</p> <p>Having to take decongestants worries me as I've heard they increase the blood pressure</p> <p>I don't really like taking medications, I feel that they may be harmful to the body</p> <p>I don't want to take medications, I prefer the body to fight off the infection naturally</p> <p>Is it better to take all-in-one treatments or individual remedies for each symptom?</p>

Section 15***Frequently Asked Questions* on managing my symptoms****I'm not sure if I'm doing the right thing**

Although sinusitis and its associated symptoms can make you feel very ill they seldom lead to more serious complications. If you experience symptoms you have never had before or they are worse than what you have had in the past then you may worry they are a sign of a serious illness. However, medical experts agree that you do not need to worry if the symptoms take several days to settle, as long as you are getting better after you had them for 1 week, and do not last for more than 3-4 weeks.

Section 15***Frequently Asked Questions* on managing my symptoms****I tried everything and I'm still unwell,
I don't think there is anything else I can do**

The various things you are already doing may relieve your symptoms but will not shorten their duration. Sinusitis often take quite a while, sometimes up to 3 weeks, to clear away completely and for a small minority (approximately 5-10% of people) can take up to 4-6 weeks. This is might be because the linings of the nose and the sinuses are more sensitive and need more time to recover. Sometimes people are just unlucky enough to get another virus before completely recovering from the previous infection.

In either case, the doctor can do nothing really unless there is a change of symptoms i.e. they are getting much worse.

Prescribed medication such as antibiotics can do very little to speed up recovery. The advice given earlier on, based on your symptoms, will help to reduce the impact of your symptoms and enable you to get on with your everyday life. Try some of the advice suggestions if you have not already done so, and come back to this website in 2-3 days time to check the progress of your symptoms.

Section 15***Frequently Asked Questions* on managing my symptoms****Only antibiotics work for me when my symptoms are bad -
without them I will not get better and may get worse**

Most common infections and symptoms such as sinusitis are caused by viruses, but antibiotics are only effective for some infections caused by bacteria. You may have taken antibiotics in the past and felt well soon after that. This is usually due to the natural course of the symptoms – most people visit their doctor when they have had their symptoms for some time and by then the immune system has started to fight back the viruses on its own, so people are about to get better naturally anyway.

In the past doctors assumed that antibiotics were helpful for cold and flu related symptoms. Now doctors have new medical evidence that has shown that antibiotics don't work for these symptoms, so they tend not to prescribe them any more.

There is no good scientific evidence that antibiotics can prevent symptoms from getting worse or protect you from future infections.

There is also evidence from studies that antibiotics can reduce your ability to fight infections – this happens in two ways. Antibiotics stop your body mounting the full antibody response. They also kill good bacteria that we all have in our throats, and which are important in the body's defence against invading bacteria.

Section 15***Frequently Asked Questions* on managing my symptoms****I need to get better quickly and
cannot wait for my symptom(s) to take their natural course**

As sinusitis symptoms are mostly caused by viruses, recovery even with antibiotics can not be speeded up and may take up to 3-4 weeks. Your immune system is trying to fight off the virus and in doing so your body may need to slow down for a while until it recovers. However, this does not mean that you have to endure the symptoms until they completely settle. The advice given above, based on your symptoms, will help to reduce their impact and help you continue with your everyday life.

Section 15

***Frequently Asked Questions* on managing my symptoms**

I'm not sure I can make my symptoms go away

Symptoms from sinusitis take a few days before they start to settle and a few weeks before clearing away completely. Most of the work in fighting the infection is carried out by our immune system. Following the advice we suggested earlier can help ease off the symptoms but they still need to take their course before completely going away. You do not have to follow all the advice suggestions, you can try the ones you feel most comfortable with.

Section 15

***Frequently Asked Questions* on managing my symptoms**

**I had a nasty infection in the past and
I want to ensure that I won't go through the same thing again**

Having a bad infection in the past does not necessarily make you more vulnerable to future infections. If you feel you are coming down with something similar to what you had before then the advice given earlier on can help limit the impact of those symptoms on your body. There is no strong scientific research suggesting that other treatments such as antibiotics can prevent symptoms from getting worse or protect you from future infections.

Section 15

***Frequently Asked Questions* on the treatment prescriptions**

Is it safe to take Paracetamol and Ibuprofen together?

Yes it is safe, and you can take full doses of both. If you have indigestion, past stomach ulcers or asthma then avoid taking Ibuprofen.

Section 15***Frequently Asked Questions* on the treatment prescriptions**

**Having to take decongestants worries me as
I've heard they increase the blood pressure**

There is no good evidence of any harmful effect. If you take decongestants containing pseudoephedrine there might be a small negative effect on blood pressure in the short term. Therefore, if you have high blood pressure that you know is not well controlled but want to take something, you could avoid taking mixtures containing pseudoephedrine. However, more studies need to be done to know for sure.

Section 15***Frequently Asked Questions* on managing my symptoms**

**I don't really like taking medications,
I feel that they may be harmful to the body**

We have not suggested any medications when there is evidence they are harmful to the body. The treatment advice earlier on gives details when some medications have side effects or when evidence is not yet clear. You don't have to take any medications and we have suggested alternative ways of easing your symptoms.

Section 15***Frequently Asked Questions* on managing my symptoms**

**I don't want to take medications,
I prefer the body to fight off the infection naturally**

You don't have to take any medications. The medications are just to ease symptoms and not cure you. We have suggested alternatives ways of easing your symptoms without having to take medications.

Section 15

Frequently Asked Questions on the treatment prescriptions

Is it better to take all-in-one treatments or individual remedies for each symptom?

Some people find an all-in-one remedy convenient so that all of the symptoms can be treated together. These products usually contain a painkiller to ease aches and pains and lower body temperature, as well as a decongestant to unblock the nose.

Others prefer to treat each symptom individually so you do not have to take all of the ingredients in the all-in-one remedies. There is no research showing these products to be superior to the individual ones.

If you are thinking of choosing an all-in-one remedy, it is important to identify the symptoms that you wish to relieve, e.g. Do you need a painkiller?/ Is your nose blocked?/ Do you require a product that will not make you drowsy? Answering these questions will help you decide whether an all-in-one remedy is more appropriate than the use of individual products.

Section 16

Do you have any other symptoms you would like advice about?

Cough

Sore throat

Runny or stuffy nose

Earache

Section 17

Who is providing the advice?

All the information you received today has been put together by health researchers and health care professionals experts in their field at the University of Southampton. The information was based on reliable research evidence drawn from many scientific resources, including these papers:

Appendix 12 Intervention Materials for Sinusitis

- 1) Arroll B, Kenealy T(2005) Antibiotics for the common cold and acute purulent rhinitis. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD000247
- 2) De Sutter AIM, Lemiengre M, Campbell H. Antihistamines for the common cold. Cochrane Database of Systematic Reviews 2003, Issue 3. Art. No.: CD001267.
- 3) Del Mar CB et al (2006) Antibiotics for sore throat. Cochrane Database of Systematic Reviews, Issue 4, Art. No. CD000023
- 4) Douglas RM, Hemila H., Chalker E, Treacy B (2007). Vitamin C for preventing and treating the common cold. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD000980
- 5) Fahey et al (1998) Quantitative systematic review of randomised controlled trials comparing antibiotic with placebo for acute cough in adults. British Medical Journal, 316: 906-10.
- 6) Fahey et al (2004) Antibiotics for acute bronchitis. Cochrane Database of Systematic Reviews, Issue 4. Art. No.:CD000245
- 7) Hueston WJ (1997) Antibiotics: neither cost effective nor 'cough' effective. Journal of Family Practice, 44:261-5.
- 8) Shah SA, Sander S, White CM, Rinaldi, M, Coleman CI (2007). Evaluation of Echinacea for the prevention and treatment of common cold: a meta-analysis. The Lancet Infectious Diseases, Vol. 7(7): 473-480.
- 9) Schroeder K, Fahey T (2004) Over-the-counter medications for acute cough in children and adults in ambulatory settings. Cochrane Database of Systematic Reviews, Issue 4. Art. No.: CD001831
- 10) Singh M (2006) Heated, humidified air for the common cold. Cochrane Database of Systematic Reviews, Issue 3, Art.No. CD001728
- 11) Taverner D, Latte J (2007) Nasal decongestants for the common cold. Cochrane Database of Systematic Reviews 2007, Issue 1. Art. No.: CD001953.
- 12) Verkatesum P, Innes JA (1995) Antibiotic resistance in common acute respiratory pathogens. Thorax, 50:418-3.
- 13) Verheij T, Hermans J, Kaptein A, Mulder J (1995) Acute bronchitis: course of symptoms and restrictions in patients daily activities. Scandinavian Journal of Primary Health Care, 13:8-12.

**Appendix 13. Questionnaire study - Advert
(for the online completion and mail outs)**

Have you had symptoms related to a respiratory infection?

These are infections which include flu-related symptoms, chest infections, cough, sore throat, tonsillitis, runny/stuffy nose, sinusitis, fever, feeling achy and unwell.

If so, we would like your help!

**You may experience some of these symptoms now
or you may have had them in the past.**

My name is Panayiota Andreou and I am carrying out this survey as part of my PhD. I am interested in finding out more about people's experiences of having a respiratory infection: how it affected you, what did you do, how long it took to clear out. This information will give us a better picture of what things we can target in future programs which will aim to help people to deal better with such symptoms.

This involves completing a few questionnaires that take approximately 30 minutes.

At the end you will receive a £5 thank you token.

If you are over 16 then we would like to hear from you. If you are interested or would like to know more about this study please contact me at my office number (023) 80231047 or email pa1@soton.ac.uk . Thank you.

Appendix 14 Questionnaire study – Questionnaires

We are interested in your views related to symptoms due to respiratory infections. These are infections which include flu-related symptoms, chest infections, cough, sore throat, tonsillitis, runny/stuffy nose, sinusitis, fever, feeling achy and unwell.

Please think of a time when you had such symptoms that you considered seeing a doctor (or a nurse). If you cannot remember a time when you considered seeing a doctor for these symptoms then please think of the last time you had bad symptoms of this kind.

We are interested in your opinion on the following statements. There are no right or wrong answers. Please read each statement and indicate the degree to which you agree or disagree by selecting the appropriate number.

	<i>Strongly Agree</i>	<i>Strongly Disagree</i>
I wasn't sure I could continue taking care of my symptoms without seeing a doctor because:		
1. It seemed they were getting worse	0 1 2 3 4 5 6 7 8 9 10	
2. I had a high temperature for over 2 days	0 1 2 3 4 5 6 7 8 9 10	
3. They were taking longer to ease off than I expected	0 1 2 3 4 5 6 7 8 9 10	
4. They were unusual and I have never had them before	0 1 2 3 4 5 6 7 8 9 10	
5. I felt poorly	0 1 2 3 4 5 6 7 8 9 10	
6. I have seen the doctor for a similar situation in the past	0 1 2 3 4 5 6 7 8 9 10	
7. I was given a prescription in the past for similar symptoms	0 1 2 3 4 5 6 7 8 9 10	
8. My immune system is usually weak most of the time	0 1 2 3 4 5 6 7 8 9 10	
9. I couldn't carry on with my everyday things	0 1 2 3 4 5 6 7 8 9 10	
I wasn't sure there was anything else I could do for my symptoms because:		
10. They were going on for too long	0 1 2 3 4 5 6 7 8 9 10	
11. They didn't seem to get better	0 1 2 3 4 5 6 7 8 9 10	
12. My friends and/or family were advising me to see the doctor	0 1 2 3 4 5 6 7 8 9 10	
13. They kept coming back	0 1 2 3 4 5 6 7 8 9 10	

Appendix 14 Questionnaire study – Questionnaires

	Strongly Agree					Strongly Disagree				
I thought if I didn't go to the doctor early on then:										
14. My symptoms would get worse or get more complicated	0	1	2	3	4	5	6	7	8	9
										10
15. It would have taken me longer to recover	0	1	2	3	4	5	6	7	8	9
										10
16. My symptoms might have developed into something more serious	0	1	2	3	4	5	6	7	8	9
										10
I thought if I went to the doctor then:										
17. I would definitely know whether my symptoms were serious or not	0	1	2	3	4	5	6	7	8	9
										10
18. I would get a stronger medication to recover quicker	0	1	2	3	4	5	6	7	8	9
										10
19. I would feel more reassured	0	1	2	3	4	5	6	7	8	9
										10
20. I would get a sick leave to have more time to rest	0	1	2	3	4	5	6	7	8	9
										10
21. I would feel awkward if I wasted their time	0	1	2	3	4	5	6	7	8	9
										10
22. It would not make much difference to whether I got better more quickly	0	1	2	3	4	5	6	7	8	9
										10
23. I would get a prescription and be able to get back to everyday life more quickly	0	1	2	3	4	5	6	7	8	9
										10
I thought if I used antibiotics early on										
24. I would get better more quickly	0	1	2	3	4	5	6	7	8	9
										10
25. My symptoms wouldn't get worse	0	1	2	3	4	5	6	7	8	9
										10
26. My symptoms wouldn't take long to ease off	0	1	2	3	4	5	6	7	8	9
										10
27. Where I live it's difficult to travel from home to see the doctor										
28. I am not sure where to find out relevant health information without seeing the doctor	0	1	2	3	4	5	6	7	8	9
										10
29. In my area it's difficult to get a doctor's appointment when I need it.	0	1	2	3	4	5	6	7	8	9
										10

Think of the time when you had the respiratory symptoms that you answered about in the previous questions. Now please fill in this questionnaire as you would have filled it in when you had those symptoms.

In other words, we want to know how you felt about those symptoms at the time.

Please indicate how much you agree or disagree with the following statements by ticking the appropriate box.

	Views about your symptoms	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
IP1	My symptoms last a short time					
IP2	My symptoms are likely to be permanent rather than temporary					
IP3	My symptoms last for a long time					
IP4	This illness passes quickly					
IP5	I expect to have these symptoms for the rest of my life					
IP6	My illness is a serious condition					
IP7	My symptoms have major consequences on my life					
IP8	My symptoms do not have much effect on my life					
IP9	My symptoms strongly affect the way others see me					
IP10	My symptoms have serious financial consequences					
IP11	My symptoms cause difficulties for those who are close to me					
IP12	There is a lot which I can do to control my symptoms					
IP13	What I do can determine whether my symptoms gets better or worse					
IP14	The negative effects of my symptoms can be prevented (avoided) by my treatment					
IP15	My treatment can control my symptoms					
IP16	There is nothing which can help my condition					
IP17	The symptoms of my condition are puzzling to me					
IP18	My symptoms is a mystery to me					

Appendix 14 Questionnaire study – Questionnaires

Please remember to tick the following statements by having in mind how you felt about those symptoms at the time.

		<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>
IP19	I don't understand my symptoms					
IP20	My symptoms don't make any sense to me					
IP21	I have a clear picture or understanding of my symptoms					
IP22	The symptoms of my illness change a great deal from day to day					
IP23	My symptoms come and go in cycles					
IP24	My symptoms are very unpredictable					
IP25	I go through cycles in which my symptoms get better and worse					
IP26	I get depressed when I think about my symptoms					
IP27	When I think about my symptoms I get upset					
IP28	My symptoms make me feel angry					
IP29	My symptoms do not worry me					
IP30	Having these symptoms make me feel anxious					
IP31	My symptoms make me feel afraid					
IP32	My treatment is effective in curing my symptoms					
IP33	There is very little that can be done to improve my symptoms					
IP34	My symptoms improves in time					
IP35	My actions have no affect on the outcome of my symptoms					
IP36	I have the power to influence my symptoms					
IP37	Nothing I do affects my symptoms					
IP38	The course of my symptoms depends on me					

Beliefs about managing symptoms questionnaire

We are interested in your views related to managing your symptoms due to respiratory infections.

You may experience such symptoms now or you may have had them in the past. We are interested in your opinions. There are no right or wrong answers. Please read each statement and indicate the degree to which you agree or disagree by selecting the appropriate number.

		<i>Strongly disagree</i>	<i>Strongly agree</i>
1	Antibiotics can be harmful to the body	1 2 3 4 5	
2	Antibiotics are not appropriate for my symptoms	1 2 3 4 5	
3	My symptoms start to feel better when I'm taking over-the-counter remedies	1 2 3 4 5	
4	Taking antibiotics worries me as they can make the body depend on them.	1 2 3 4 5	
5	Taking supplements such as vitamins helps the immune system to fight off the infection	1 2 3 4 5	
6	Taking over-the-counter remedies for my symptoms can give me side-effects	1 2 3 4 5	
7	Taking antibiotics for my symptoms does more harm than good as they can make infections harder to treat in the future.	1 2 3 4 5	
8	I need to take antibiotics to get better quickly	1 2 3 4 5	
9	Over-the-counter remedies don't stop my symptoms from coming back	1 2 3 4 5	
10	Without antibiotics my symptoms will get worse	1 2 3 4 5	
11	I take over-the-counter remedies for my symptoms because they make my symptoms not feel as bad	1 2 3 4 5	
12	My symptoms resolve on their own without taking anything	1 2 3 4 5	
13	I prefer taking home remedies because they are cheaper and help my symptoms	1 2 3 4 5	
14	The body can deal with the symptoms on its own without having to take anything	1 2 3 4 5	
15	Taking over-the-counter remedies can smooth my symptoms	1 2 3 4 5	
16	People who take medicines should stop their treatment for a while every now and again	1 2 3 4 5	
17	Natural remedies are safer than medicines	1 2 3 4 5	
18	Medicines do more harm than good	1 2 3 4 5	
19	All medicines are poisons	1 2 3 4 5	
20	Doctors place too much trust on medicines	1 2 3 4 5	
21	Most medicines are addictive	1 2 3 4 5	

Appendix 14 Questionnaire study – Questionnaires

		<i>Strongly disagree</i>	<i>Strongly agree</i>
		1 2 3 4 5	
22	Antibiotics stop the infection from spreading	1 2 3 4 5	
23	Over-the-counter remedies can make symptoms go away quicker	1 2 3 4 5	
24	Doctors use too many medicines	1 2 3 4 5	
25	If doctors had more time with patients they would prescribe fewer medicines	1 2 3 4 5	
26	Antibiotics help recover from my infection quicker	1 2 3 4 5	
27	I can carry on with my everyday things when I take over-the-counter remedies	1 2 3 4 5	
28	Taking supplements such as vitamins frequently can help not to get an infection	1 2 3 4 5	
29	Only time can help my symptoms.	1 2 3 4 5	
30	I prefer doing nothing about my symptoms and letting the body to recover on its own	1 2 3 4 5	

The following questionnaire asks about you, your lifestyle, your health and medical problems, and about how you feel about yourself.

- What is your age?
- What sex are you? (please tick) Male Female
- What are your **highest** formal educational qualifications?

No formal educational qualifications
 CSEs / O'Levels / GCSEs (or similar)
 A'Levels (or similar)
 Diploma / Other vocational qualification
 Degree
 Postgraduate or professional qualification
 Other

- Where do you currently live? (Please tick one)

University Halls
 Living with parents
 Living independently – alone
 Living independently – sharing
 Living independently – with partner/ family
 Other (please state).....

- Which one of these categories best describes your current employment status?

Full-time employee
 Part-time employee
 Self-employed
 Homemaker
 Retired
 Not in paid employment due to disability / long-term sickness
 Unemployed for more than one year

Appendix 14 Questionnaire study – Questionnaires

Unemployed for less than one year
 Student
 Other

▪ What is your smoking status?
 Never smoked Ex-smoker Current smoker

- Do you drink alcohol? Yes No
- If yes, how many units usually a week? units
 (1 unit = ½ pint of beer or 1 glass of wine or 1 tot of spirits)
- How would you describe your ethnic background? (please tick one)

White British
 White non-British
 Black Caribbean
 Black African
 Black other

Indian
 Pakistani
 Bangladeshi
 Chinese
 Other

▪ Has a doctor ever told you that you have had one of the following?
 (Please tick all that applies to you)

Kidney/Liver disease
 Diabetes
 Hypertension/ high blood pressure
 Arthritis
 Back problem
 Asthma
 Chronic bronchitis
 Eczema/chronic skin problem
 Anxiety/depression
 Thyroid problems
 Blindness
 Deafness
 Compulsive Obstructive Pulmonary Disease (COPD)

Stroke/mini stroke
 Angina or heart attack
 Heart failure
 Irritable bowel syndrome
 Ulcerative colitis/Crohn's Disease
 Migraine/tension headache
 Multiple sclerosis
 Cancer
 Gall stones/pancreatitis
 M.E.
 Stomach ulcer
 Parkinson's Disease
 Lung disease

Other (please state).....

▪ How would you rate your health at the moment?

Very good Good Poor Very poor

▪ **When was the last time you were unwell due to a respiratory infection that you considered seeing a doctor (or a nurse)?**

These are infections which include flu-related symptoms, chest infections, cough, sore throat, tonsillitis, runny/stuffy nose, sinusitis, fever, feeling achy and unwell. If you cannot remember a time when you considered seeing a doctor for these symptoms then please think of the last time you had bad symptoms of this kind (Please tick one).

I am unwell now

Appendix 14 Questionnaire study – Questionnaires

A few weeks ago
A few months ago
A few years ago
I can not remember
I don't know

- What were your symptoms?

Please state

- **Did you see a doctor or a nurse at the end for the symptoms you referred earlier on?** Yes / No

- If yes, can you remember who? (please tick one)

GP
Nurse
A&E
Other (please state)

Please tick YES or NO in the appropriate box, in answer to the following questions

Yes No

Do you often worry about the possibility that you have got a serious illness?

--	--

Are you bothered by many pains and aches?

--	--

Do you find that you are often aware of various things happening in your body?

--	--

Do you worry a lot about your health?

--	--

Do you often have the symptoms of very serious illness?

--	--

If a disease is brought to your attention (through the radio, television, newspapers or someone you know), do you worry about getting it yourself?

--	--

If you feel ill and someone tells you that you are looking better, do you become annoyed?

--	--

Do you find that you are bothered by many different symptoms?

--	--

Is it easy for you to forget about yourself, and think about all sorts of other things?

--	--

Is it hard for you to believe the doctor when he tells you there is nothing for you to worry about?

--	--

Do you get the feeling that people are not taking your illness seriously enough?

--	--

Do you think that you worry about your health more than most people?

--	--

Do you think there is something seriously wrong with your body?

--	--

Appendix 14 Questionnaire study – Questionnaires

Are you afraid of illness? [] []

The following questions ask about how you have been in the last 4 weeks (please tick one box for every question)

Physical Condition: During the last 4 weeks.....

What was the **most strenuous** level of physical activity you could do for **at least 2 minutes?**

Very Heavy	e.g. run fast pace, carry heavy bag of groceries upstairs	[] [] [] [] []
Heavy	e.g. jog slow pace, climb stairs moderate pace	
Moderate	e.g. walk fast pace, garden, easy digging, carry heavy bag of groceries	
Light	e.g. walk regular pace, golf, carry light bag of groceries	
Very Light	e.g. walk slow pace, drive car, wash dishes	

Emotional Condition: During the past 4 weeks...

How much have you been bothered by emotional problems such as feeling unhappy, anxious, depressed, irritable?

Not at all	[]
Slightly	[]
Moderately	[]
Quite a bit	[]
Extremely	[]

Social Activities: During the past 4 weeks...

To what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours or groups?

Not at all	[]
Slightly	[]
Moderately	[]
Quite a bit	[]
Extremely	[]

Daily Work: During the past 4 weeks...

How much difficulty did you have doing your daily work, both inside and outside the house, because of your physical health or emotional problems?

No difficulty at all	[]
A little bit of difficulty	[]
Some difficulty	[]
Much difficulty	[]
Could not do	[]

Pain: During the past 4 weeks...

How much bodily pain have you generally had?

No pain	[]
Very mild pain	[]
Mild pain	[]
Moderate pain	[]
Severe pain	[]

Change in Condition: How would you rate your physical health and emotional condition now compared to 4 weeks ago?

Much better	[]
A little better	[]
About the same	[]
A little worse	[]
Much worse	[]

Overall Condition: During the past 4 weeks... How would you rate your overall physical health and emotional condition?

Excellent	[]
Very good	[]
Good	[]
Fair	[]
Poor	[]

Appendix 14 Questionnaire study – Questionnaires

Social Support: During the past 4 weeks...was someone available to help you if you needed and wanted help? For example if you ...

- felt very nervous, lonely or "blue"
- got sick and had to stay in bed
- needed someone to talk to
- needed help with daily chores
- needed help just taking care of yourself

Quality of Life: How has your quality of life been during the last 4 weeks? i.e. How have things been going for you?

- Very well, could hardly be better
- Pretty good
- Good and bad parts about equal
- Pretty bad
- Very bad, could hardly be worse

Yes, as much as I wanted
Yes, quite a bit
Yes some
Yes, a little
No, not at all

Your thoughts about getting advice from the doctor

How strongly do you agree with these statements? (Please tick one box for every question)

	Strongly agree	Agree	Tend to agree	Tend to disagree	Disagree	Strongly disagree
I only consult a doctor if I'm at death's door						
Doctors blame their patients if their treatment doesn't work						
Doctors are important in keeping us healthy						
No two doctors will agree on what is wrong with a person						
Doctors are too ready to solve patient's problems by prescribing tranquillisers						
I don't like medical people						
I often need to return to the doctor more than once to get the right treatment						
I usually try medicines from the chemist before going to see the doctor when I am unwell						

Have you suffered from any of the following symptoms over the past few years with no cause being found for them? Please tick 'Yes' only if your symptoms were sufficiently severe to have a big effect on your everyday life or if they caused you to see your doctor

Yes No

Vomiting (except during pregnancy)

Abdominal (tummy) pain (except during periods)

Nausea (feeling sick) (excluding car sickness)

Feeling bloated or 'gassy'

Diarrhoea (loose motions)

Intolerance of (get sick from) foods

Pain in your arms, legs, hands or feet

Back pain

Joint pain

Pain when you urinate

Have you suffered from any of the following symptoms over the past few years with no cause being found for them? Please tick 'Yes' only if your symptoms were sufficiently severe to have a big effect on your everyday life or if they caused you to see your doctor

	Yes	No
Other pains (except headache)	<input type="checkbox"/>	<input type="checkbox"/>
Shortness of breath when not exerting yourself	<input type="checkbox"/>	<input type="checkbox"/>
Palpitations (heart racing or pounding)	<input type="checkbox"/>	<input type="checkbox"/>
Chest pain	<input type="checkbox"/>	<input type="checkbox"/>
Dizziness	<input type="checkbox"/>	<input type="checkbox"/>
Loss of memory (for several hours or more)	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty swallowing	<input type="checkbox"/>	<input type="checkbox"/>
Loss of voice for more than a few minutes	<input type="checkbox"/>	<input type="checkbox"/>
Loss of hearing (deafness)	<input type="checkbox"/>	<input type="checkbox"/>
Double vision	<input type="checkbox"/>	<input type="checkbox"/>
Blurred vision	<input type="checkbox"/>	<input type="checkbox"/>
Periods of blindness (more than a few seconds)	<input type="checkbox"/>	<input type="checkbox"/>
Fainting spells or loss of consciousness	<input type="checkbox"/>	<input type="checkbox"/>
A seizure or convulsion (fit)	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty walking	<input type="checkbox"/>	<input type="checkbox"/>
Muscle weakness or paralysis	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty passing water	<input type="checkbox"/>	<input type="checkbox"/>
Burning sensation in sexual organs or back passage	<input type="checkbox"/>	<input type="checkbox"/>
Loss of sex drive	<input type="checkbox"/>	<input type="checkbox"/>
Pain during sexual intercourse	<input type="checkbox"/>	<input type="checkbox"/>
Impotence (failure of erection)	<input type="checkbox"/>	<input type="checkbox"/>
For women only: have you had any of the following symptoms more often or more severely than most other women?		
Painful periods	<input type="checkbox"/>	<input type="checkbox"/>
Irregular periods	<input type="checkbox"/>	<input type="checkbox"/>
Excessively heavy bleeding during periods	<input type="checkbox"/>	<input type="checkbox"/>
Vomiting throughout pregnancy	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 15. Questionnaire study –Information and Consent form (online version)

Beliefs about Respiratory Tract Infections

I am Panayiota Andreou, a PhD student at the University of Southampton.

I am requesting your participation in a study regarding my research project looking at beliefs about respiratory tract infections. This will involve answering a few questionnaires about your symptoms, your views how best to treat them and some background demographic and medical information that take approximately 30 minutes to complete. You will be asked to read each question carefully and to be as honest and accurate as possible. There are no right or wrong answers for any part of the study. Personal information will not be released to or viewed by anyone other than researchers involved in this project. Results of this study will not include your name or any other identifying characteristics.

Your continued participation in this research will be taken as evidence of your giving informed consent to participate in this study, for your data to be used for the purposes of research, and that you understand that published results of this research project will maintain your confidentiality.

In completing the study you are also certifying that you are 16 years or older (no one under the age of 16 can take part in this questionnaire). Your participation is voluntary and you may withdraw your participation at any time. *[For students: If you choose not to participate there will be no consequences to your grade or to your treatment as a student in the psychology department].*

At the end you will receive a £5 thank you token. You will be asked to provide your name and postal address in order to send you the thank you token. Your contact details are needed only for this purpose and will not be kept once I send the token.

A summary of this research project will be supplied to you upon request. To request a project summary or if you have any further questions please contact me at pa1@soton.ac.uk.

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: (023) 8059 5578.

Appendix 16 Questionnaire study -Consent Form (print version)

Beliefs about Respiratory Tract Infections Letter of Consent

Hello, I am Panayiota Andreou, a PhD student at the University of Southampton.

I am requesting your participation in a study regarding my research project looking at beliefs about respiratory tract infections. This will involve answering a few questionnaires about your symptoms, your views how best to treat them and some background demographic and medical information that take approximately 30 minutes to complete. You will be asked to read each question carefully and to be as honest and accurate as possible.

There are no right or wrong answers for any part of the study. Personal information will not be released to or viewed by anyone other than researchers involved in this project. Results of this study will not include your name or any other identifying characteristics.

Completion and return of the questionnaire will be taken as evidence of you giving informed consent to participate in this study, for your data to be used for the purposes of research, and that you understand that published results of this research project will maintain your confidentiality. In completing the study you are also certifying that you are 16 years or older (no one under the age of 16 can take part in this questionnaire).

Your participation is voluntary and you may withdraw your participation at any time. *[For students: If you choose not to participate there will be no consequences to your grade or to your treatment as a student in the psychology department].*

At the end you will receive a £5 thank you token for your participation. You will find a reply slip attached to the questionnaire where you can write your name and postal address in order to send you the thank you token. Your contact details are needed only for this purpose and will not be kept once I send the token.

Once you complete the slip please put it in the enclosed freepost envelope with the questionnaire and send it back to me. No stamp is required.

A summary of this research project will be supplied to you upon request. To request a project summary or if you have any further questions please contact me at pa1@soton.ac.uk

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: +44 23 8059 5578.

Appendix 17 Questionnaire study – Information sheet (print version)

Further information about the study: Participant Information Sheet

Study Title: Beliefs about respiratory tract infections

Researcher: Panayiota Andreou

Ethics number: 164

Please read this information carefully before deciding to take part in this research.

What is the research about?

This study is part of my PhD and I am interested in finding out more about what people's beliefs and thoughts are about respiratory tract infections. These are infections which include symptoms such as cough, chest infections, sore throat, feeling achy and unwell. Such information will help us to understand better how people deal with this kind of symptoms and when they decide to see their doctor. This will give us a better picture of what things we can target in future programs which would aim to help people to deal better with such symptoms. The study is funded by the University of Southampton.

Why have I been chosen?

You have been asked to take part based on random selection.

What will happen to me if I take part?

If you decide to take part in the study, you will be asked to complete some questionnaires about your lifestyle, your experience with such symptoms such as your thoughts on what caused your symptoms, your views about the best way to cope with them and some background demographic and medical information. Completing the questionnaires will take approximately 30 minutes.

Are there any benefits in my taking part?

You are unlikely to benefit directly from taking part in the study. However, your participation will help to develop programs that could help people in the future to deal better with such symptoms.

Are there any risks involved?

Some of the questionnaires may ask personal questions about your health and lifestyle in general. The answers are strictly confidential. No one else will see your responses and there will be no name to identify you.

Will my participation be confidential?

All information which is collected about you will be anonymous and will be kept strictly confidential. The responses will be viewed only by the researchers involved in the study. This study complies with the Data Protection Act and University policy and the questionnaires will be kept locked in a filing cabinet accessed only by me. The contact details you provide on the reply slip will only be used in order to send you the voucher and will not be kept or stored after that.

Appendix 17 Questionnaire study – Information sheet *continued*

What will happen to me if I take part?

If you decide to take part in the study, you will be asked to complete some questionnaires about your lifestyle, your experience with such symptoms such as your thoughts on what caused your symptoms, your views about the best way to cope with them and some background demographic and medical information. Completing the questionnaires will take approximately 30 minutes. With the questionnaires there is an enclosed free post envelope which you can use to send the completed questionnaire back to me.

At the end you will receive a £5 thank you token for your participation. You will need to complete the reply slip attached at the back of the questionnaire with your contact details in order to send you the token. Once you complete the slip please put it with the questionnaire in the free post envelope addressed to me. If you do not wish to give your contact details, then please leave the reply slip blank and put only the completed questionnaire in the freepost envelope. You do not need to put any stamp.

Are there any benefits in my taking part?

You are unlikely to benefit directly from taking part in the study. However, your participation will help to develop programs that could help people in the future to deal better with such symptoms.

Are there any risks involved?

Some of the questionnaires may ask personal questions about your health and lifestyle in general. The answers are *strictly* confidential. No one else will see your responses and there will be no name to identify you.

What happens if I change my mind?

You have the right to withdraw at any time without your legal right being affected.

What happens if something goes wrong?

It is highly unlikely that taking part in this study will lead to any harm or discomfort. However, if you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: (023) 8059 5578.

Where can I get more information?

Further information about this study can be obtained from Panayiota Andreou, who will be carrying out the research. Panayiota can be contacted at the email address pa1@soton.ac.uk or at post address: Primary Medical Care, Aldermoor Close, Southampton, SO16 5ST.

Appendix 18 Questionnaire study – Debrief form

Beliefs about respiratory tract infections **Debriefing Statement – *you can keep this for your records***

The aim of this research was to find out more about what people's beliefs and thoughts are about respiratory tract infections. Your data will help our understanding of how people deal with such symptoms and what influences their decision to see their doctor.

It is expected that this information will give us a better picture of what things we can target in future programs which would aim to help people to deal better with such symptoms.

Once again results of this study will not include your name or any other identifying characteristics. The research did not use deception.

You may have a copy of this summary if you wish and a summary of this research project will be supplied to you upon request. To request a project summary questions please contact me at pa1@soton.ac.uk

If you have any further questions please contact me, Panayiota Andreou, at pa1@soton.ac.uk or at the post address: Primary Medical Care, Aldermoor Close, Southampton, SO16 5ST.

Thank you for your participation in this research.

Panayiota Andreou

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ.
Phone: (023) 8059 5578.

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