

**Factors influencing physical activity behaviour in adults
at risk of coronary heart disease: A quantitative and
qualitative study of an exercise referral scheme**

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Abbreviations

BEB	Bebington
BIK	Birkenhead
BHF	British Heart Foundation
CHD	Coronary heart disease
CVD	Cardiovascular disease
CHLC	Chance health locus of control
DoH	Department of Health
ELC	Exercise and Lifestyle Centres
GP	General Practitioner
HEA	Health Education Authority
HDA	Health Development Agency
HLC	Health locus of control
IHLC	Internal health locus of control
MHLC	Multidimensional health locus of control
MSLT	Modified social learning theory
NHS	National Health Service
NQAF	National Quality Assurance Framework for Exercise Referral Schemes
ONS	Office for National Statistics
PHLC	Powerful others health locus of control
PCG	Primary Care Group
PCT	Primary Care Trust
TPB	Theory of Planned Behaviour
W	Wallasey
WHO	World Health Organisation

Factors influencing physical activity behaviour in adults at risk of coronary heart disease

Abstract

Background

The thesis consists of a series of studies relating to physical activity in adults resident in Wirral, North West England. The first study is a survey of the health and lifestyles of the general adult population, which sets the context for the other studies. The subsequent studies focus on a specific section of this population. These were adults who were at risk of coronary heart disease who had been referred to a primary care exercise referral scheme (called the Exercise and Lifestyle Centres or ELC). The research adopted health locus of control (HLC) and Wallston's modified social learning theory (MSLT) as a theoretical perspective in order to explore physical activity behaviour (Wallston, 1992). A self-regulatory model of health behaviour was also found to be a useful framework for explaining concepts that emerged from the studies (Leventhal, Diefenbach & Leventhal, 1992).

Aims

The aim of the thesis was to investigate factors that are associated with, and have an impact on physical activity behaviour. In particular, it sought to explore and understand factors that influence the initiation and maintenance of activity in individuals referred into the ELC scheme. It also set out to investigate the usefulness of HLC and Wallston's MSLT in helping to understand physical activity in this population group.

Methodology

Quantitative methods included a large scale survey of a sample of the Wirral population, an evaluation of the ELC scheme and a study of Wallston's MSLT. Findings were analysed using chi square analysis, logistic regression and structural equation modelling. Qualitative methods included semi-structured interviews with thirty two individuals who were referred to the ELC. An adaptation of grounded theory methodology was used as advocated by Smith (2001), Charmaz (2001) and described by Bennett and Vidal-Hall (2000).

Findings

Factors found to influence physical activity behaviour included age; gender; perceptions of health status; illness representations; beliefs about capability to

participate in physical activity; beliefs about the pros and cons of engaging in activity (such as health benefits, enjoyment and social interaction versus risk of injury, lack of time and competing demands of work and family); beliefs about whether own actions would have an influence on valued outcomes; receptivity to the health message from General Practitioners (GPs); time perspective with respect to illness representations and the value placed on the longer-term benefits of physical activity.

Discussion

There was a complex relationship between the factors that were found to influence the initiation and maintenance of activity. Age was particularly influential and appeared to have a mediating influence on health status, illness representations, self-efficacy, health value, HLC beliefs and barriers towards activity (such as fear of injury and perceptions of enjoyment). Gender was also a key influence on the initiation of activity. Having a combination of internal HLC and powerful other HLC beliefs was particularly important in initiating activity on the ELC. Other factors that contributed to adherence to the ELC included enjoyment, obtaining valued outcomes and positive perceptions of self-efficacy. However, maintenance of activity beyond the ELC was positively influenced by a time perspective that viewed health as a long-term valued outcome, that could be achieved via continued physical activity behaviour, which was found to be within capabilities to carry out and enjoyable.

Recommendations

Adopting a one size fits all strategy will not be very effective in increasing levels of physical activity. Support needs to be focused towards the age and gender profile of participants, their health conditions, particular barriers and concerns, as well as their psychological preferences and perspectives (e.g. their HLC beliefs, perceptions of capability and readiness to change).

Conclusion

Physical activity behaviour is both complex and multi-determined. Constructs from different models need to be integrated in order to understand physical activity. Qualitative methods are particularly helpful in understanding the differences between those who participate in a primary care exercise referral scheme and those who do not.

Declaration

No portion of this work has been submitted in support of any other application for degree or qualification in this or any other University or institute of learning.

Part One

Introduction to the thesis

Chapter 1

Overview of the thesis

1.1 Introduction

This thesis presents the findings from a series of related studies carried out with adults resident in the county of Wirral, North West England. The overall focus is on physical activity behaviour and coronary heart disease (CHD). The researcher aims to investigate factors that are associated with and have an impact on physical activity, and in particular, to explore and understand physical activity behaviour in Wirral adults with risk factors pre-disposing them to CHD, and to differentiate between those who are successful in changing their physical activity behaviour and those who are not.

Both quantitative and qualitative methodologies have been used in this research. There were three quantitative studies. The first was a postal survey that identifies the health and lifestyle habits of Wirral adults. The second was an evaluation of a primary care exercise referral scheme (an intervention designed to increase physical activity in individuals at risk of CHD), called the Exercise and Lifestyle Centres (ELC). The third quantitative study explored the usefulness of Wallston's modified social learning theory in understanding physical activity behaviour. Quantitative methodology was used to explore the relationships between physical activity behaviour and various other factors (chi square and logistic regression analysis were undertaken). In addition, structural equation modelling was carried out in order to develop a framework that would help to understand physical activity behaviour. A qualitative study was also carried out with a sample of Wirral adults who were referred to the ELC. Semi-structured interviews were undertaken with thirty two individuals (half of them had completed the ELC programme and half had not). Grounded theory methodology was used to collect and analyse the data from the interviews.

Over the last forty years a number of models have been developed in order to study and understand health behaviour (e.g. Health Belief Model; Theory of Planned Behaviour; Protection Motivation Theory; Social Cognition Theory; Health Locus of Control, Transtheoretical Model). These models contain a variety of constructs and therefore provide useful frameworks for examining physical activity intentions and

behaviour. However, whilst a large number of variables have been found to be consistently related to physical activity, many of these variables have not been associated with a specific theory or model. This has led Bauman, Sallis, Dziewaltowski and Owen (2002) to suggest that “it seems unrealistic to create a theory with dozens of variables, even if they all have empirical support. Even if such a complicated theory could be created, it would be virtually impossible to simultaneously measure all of its testable components. A different perspective is that physical activity is too complex a behaviour to be encompassed by a single theory” (p.10). A review of physical activity interventions concluded that current theoretical formulations to predict physical activity are quite limited (Baranowski, Anderson & Carmack, 1998). It has been suggested, therefore, that constructs from different models need to be integrated in order to understand physical activity (Baranowski *et al.*, 1998; Conner & Norman, 1998) and that qualitative approaches will help to refine our understanding of the influences on physical activity behaviour (Baranowski *et al.*, 1998).

The researcher acknowledges that the use of one model or theory in this thesis would constrain the number of variables that could be explored and would, therefore, limit the understanding of physical activity behaviour. However, in order to provide a theoretical framework for the thesis, health locus of control (Wallston, Wallston, Kaplan & Maides, 1976) and Wallston’s modified social learning theory (Wallston, 1992) have been adopted. Wallston and Wallston (1981; 1982) have suggested that a combination of health locus of control (HLC) beliefs may be particularly useful in supporting behaviour change in individuals advised to change by a health professional (as in the case of a primary care exercise referral scheme). Wallston’s modified social learning theory (MSLT) includes the concept of perceived control, which is both control over outcomes (HLC) and control over behaviour (self-efficacy), along with a measure of health value. This theory has not been tested in a primary care exercise referral scheme context. Wallston’s MSLT states that “people must value health as an outcome, believe that their health actions influence their health status, and concurrently believe that they are capable of carrying out the necessary behaviours in order to have a high likelihood of engaging in health directed action” (Wallston, 1992, p.195). The researcher acknowledges that the use of Wallston’s theory means that other potentially important variables are neglected.

In order to address this, the qualitative study incorporates Wallston's theory and, in addition, sets out to explore other variables that emerged from the interviews.

1.2 Structure of the thesis

The thesis is organised in to four parts. Part One presents the overview and background to the study. Part Two presents the quantitative findings. Part Three presents the qualitative findings. The fourth part presents a final discussion and recommendations for the future of exercise referral programmes. These are outlined briefly below.

Part One

Chapter 1

This chapter provides an introduction to and an overview of the thesis. It includes details on how the thesis is structured and the aims of each chapter.

Chapter 2

This is a comprehensive literature review and is divided up in to a number of sections. Each section relates to literature that is relevant to the study of physical activity and coronary heart disease. Due to the nature of this research, a very wide literature review was undertaken, including literature on coronary heart disease, physical activity, sedentary behaviour and obesity, interventions to promote physical activity, the role of the GP in promoting physical activity and factors that influence change in health behaviour. These factors included illness representations; health locus of control; age and gender; barriers to physical activity; stages of change; outcome expectations; self-efficacy; self-motivation and health perceptions.

Part Two

The aim of this part of the thesis is to study the health and lifestyles of the general adult population in Wirral and then to investigate a specific group of adults. This group has health problems that pre-dispose them to CHD and were referred into a primary care exercise referral intervention (the Exercise and Lifestyle Centres). All three chapters in this part include a short introduction section (with literature relevant to the study) followed by method and result sections. Each chapter then concludes with a discussion section and a summary of the chapter.

Chapter 3

This chapter presents the findings from a health and lifestyle survey carried out in 2001 with a representative sample of Wirral adults. The findings from the survey have been analysed using uni-variate chi square analysis, logistic regression and structural equation modelling. The aim of the study presented in this chapter was to:

- Investigate factors relating to the current health and physical activity behaviour of Wirral adults.
- Identify the significant associations between demographic and health related variables (for example between age and self-rated assessment of health in general).
- Identify the significant associations between physical activity, demographic and health related variables.
- Produce a model that shows which combination of variables provides the best prediction of physical activity behaviour.
- Show how the variables interact with one another in order to impact on physical activity.

Chapter 4

This chapter presents the findings from the evaluation of a Wirral based coronary heart disease intervention programme, the Exercise and Lifestyle Centres (ELC). The ELC is a twelve-week, primary care exercise referral programme. It is aimed at adults, aged sixteen and over, who have health problems that put them at risk of coronary heart disease. In addition to covering the key literature relevant to the evaluation of the programme, the introduction to this chapter also outlines the characteristics of the ELC programme. The results section covers referrals into, participation in and adherence to the intervention. In addition, it includes the impact of the intervention on physical activity after twelve weeks and on physical activity behaviour beyond the end of the intervention (at three and twelve months). The aims of the study presented in this chapter are:-

- To identify the profile (e.g. gender, age groups and geographical distribution) of the individuals who were referred into the ELC intervention and how this compares with the adult population in Wirral.

- To investigate the characteristics of the individuals who participated in the intervention (for example, gender, age, medical conditions and geographical distribution).
- To explore which factors predict adherence to the intervention.
- To establish how effective the intervention was in changing physical activity behaviour both in the short and longer term.
- To identify which participants were unlikely to complete the intervention.
- To understand the reasons why participants did not complete the intervention (barriers to physical activity).
- To explore why physical activity was not maintained in the longer-term, beyond the end of the programme.

Chapter 5

The chapter presents the findings from a study with a sample of adults who took part in the ELC programme. It is based on Wallston's Modified Social Learning Theory, which consists of three elements, health locus of control, health value and self-efficacy. Health locus of control incorporates three dimensions, internal, powerful others external and chance external. Since individuals were referred in to the ELC programme by a health professional, the powerful others element of the theory was of particular interest. This theory was selected for use in the study since it is a model that attempts to explain and predict behaviour. In addition, it has not yet been tested in this particular population group. The aims of this study were to:-

- Explore whether health locus of control is a factor that contributes to the performance of health behaviour.
- Explore whether Wallston's theory is useful for identifying individuals who will participate in a physical activity intervention.
- Investigate the usefulness of Wallston's theory in helping to understand physical activity behaviour in adults referred to a primary care exercise referral programme.

Part Three

The aim of this part of the thesis is to explore and understand physical activity behaviour in adults who were referred to the ELC. The study presented in this part is based on the findings from semi-structured interviews with thirty-two individuals who were referred to the ELC intervention. Half of them had successfully

completed the ELC intervention (participants) and the other half did not participate or failed to complete the intervention (non-participants). The first chapter (Chapter 6) sets out the qualitative methodology. The subsequent three chapters then follow the same format. Each of them covers a key domain and starts with an introduction section that includes literature relevant to the chapter, followed by a short methods section. The methods section includes definitions and properties of each of the themes. The result sections then present the findings from two distinct groups. The findings from the first group (non-participants) are shown first, followed by the second group (participants). For both non-participants and participants, the findings are shown under groupings of similar themes, with sub themes and features within these themes. The discussion section compares and contrasts the two groups and summarises the key issues from the chapter.

Chapter 6

This chapter sets out the qualitative methodology used in the study. It provides details on how grounded theory and interpretative phenomenological analysis were used. It covers issues relating to ethical approval, data protection and participant confidentiality, recruitment of the sample, sample demographics, data collection and analysis and sets out how the qualitative result chapters are structured.

Chapter 7

Chapter 7 focuses on health locus of control (HLC). Three main themes were of interest in this domain, internal HLC (IHLC), powerful others HLC (PHLC) and chance HLC (CHLC). These are further sub-divided into eight sub- (self-responsibility, internal control, information seeking, initiation of referral, communication with powerful others, relationship with powerful others, external control and genetics).

Chapter 8

This chapter presents the findings that emerged within the beliefs about health and physical activity domain. Two main themes emerged in this domain, beliefs about physical activity and beliefs about health. Within the first theme, five sub themes emerged, these were self-efficacy, importance of physical activity, expected benefits, risk perceptions (physical activity) and enjoyment. In addition, two sub themes emerged from the second theme. These were health perceptions and health concerns.

Chapter 9

This Chapter sets out the findings that emerged from the time domain. There were six main themes, 'looking backwards', 'looking forwards', 'changes in health and self-efficacy over time', 'time line', attributions relating to time (ageing) and 'management and organisation of time'.

Part Four

The final part of the thesis includes two chapters. The aims are to:

- Integrate and discuss all of the findings from each of the studies.
- Make recommendations for the future of exercise referral programmes.

Chapter 10

The Discussion Chapter pulls together the findings from all of the chapters and synthesises the key issues from the research. It sets out the aims and objectives of the thesis, the theoretical perspective and summarises the key issues from each of the empirical chapters. It then synthesises and discusses the key issues, discusses the limitations of the study, future work and draws conclusions.

Chapter 11

This has been an applied piece of research, based on a primary care exercise referral intervention in Wirral. Therefore the Recommendations Chapter makes suggestions regarding the future of similar interventions.

Chapter 2

Literature Review

2.1 Introduction

This chapter reviews the literature relevant to this thesis. The thesis is set in the context of a coronary heart disease (CHD) prevention programme. Therefore, this chapter starts with a section of CHD (2.2). The programme is a general practitioner (GP) exercise referral scheme based in Wirral. Thus, the review continues by presenting information on physical activity and physical activity interventions. This starts with a review of physical activity and its association with CHD (2.3) and moves on to discuss public health recommendations for physical activity (2.4), sedentary behaviour (2.5) and the association between physical activity and obesity (2.6). The next sections focus on literature specific to physical activity interventions and the involvement of the GP (2.7 to 2.9). The aim of the exercise referral scheme was to change behaviour in adults at risk of CHD. Therefore, the remainder of the review presents and discusses literature on factors that influence behaviour change. This includes factors that have consistently been found to be associated with participation in physical activity (age and gender; barriers to physical activity; stages of change; expected benefits/outcome expectations; self-efficacy; self-motivation and health perceptions). In addition, it includes illness representations and health locus of control. Due to the vast body of literature that is relevant to this thesis, this chapter seeks to present the findings in a structured and concise way. Unfortunately, due to limitations on the size of this thesis, it has not been possible to include comprehensive details on all of the literature referred to in this review. However, further discussion of some of the literature is included in the introduction sections of the relevant chapters. It should be noted that the literature review continued alongside the data collection and analysis. This was due to the adoption of a grounded theory approach in the qualitative study and the need to widen the literature review as new constructs were identified.

2.2 Coronary heart disease (CHD)

Diseases of the heart and circulatory system (cardiovascular disease or CVD) are the main cause of premature death in the UK (Department of Health (DoH), 1999). The principal forms of CVD are coronary heart disease (CHD) and stroke. CHD by itself

is the most common cause of death, with one in four men and one in five women dying from the disease (British Heart Foundation (BHF), 2000). Men are more likely to die from CHD than women, although this gender difference reduces with increasing age (Health Development Agency (HDA), 2000). Death rates from CHD have been slowly declining in the UK since the 1970's (BHF, 2000). However, some important CHD risk factors such as obesity and levels of inactivity have been increasing (HDA, 2000). Although death rates from CVD have been falling, there is evidence from a number of surveys that morbidity from CVD is not falling and may in fact be rising in older age groups (DoH, 1999). Hence, the extra life years gained by the elderly may be extra years with disability and poor health. For example, the Health Survey for England reported no significant change in the self-reported rates of morbidity due to CHD between 1991 and 1998 (Erens & Primatesta, 1999). In addition, the General Household Survey (Office for National Statistics (ONS), 1998a) found that over 10% of adults reported longstanding CVD. In its white paper, *Saving lives: Our Healthier Nation* (DoH, 1999) the Government set a target to reduce the death rate from CHD in people under 75 by at least 2/5ths by the year 2010. The National Service Framework for coronary heart disease (DoH, 2000) is the blueprint for tackling heart disease and lists a number of target areas. These areas encompass the provision of lifestyle advice, exercise prescription and supervision, lifestyle interventions (e.g. smoking cessation and healthy eating) and taught exercise sessions.

2.3 Physical activity and coronary heart disease (CHD)

Just over fifty years ago Morris, Heady, Raffle, Roberts and Parks, (1953) undertook the first empirical investigation of what was subsequently called the 'exercise hypothesis'. This hypothesis stated that physical activity reduces the occurrence of CHD. They reported lower rates of CHD in those who were more active in their work. Subsequent research controlled for a range of covariates and showed that physical activity in leisure time was a factor that protected against CHD (Morris *et al.*, 1973; Paffenbarger, Wing & Hyde, 1978). A series of other investigations were prompted by this early work on physical activity and CHD. This culminated in the publication of a number of reviews on the association of physical activity with CHD (Berlin & Colditz 1990; Blair, 1994; Powell, Thompson, Caspersen & Kendrick, 1987). The studies encompassed in the three reviews represent a range of

methodological rigour and have, with few exceptions, shown an inverse association between activity and CHD. That is, the highest rates of coronary heart disease are seen in people who are inactive. In addition to providing direct protection against CHD, physical activity also provides indirect protection through its influence on other risk factors. These factors include high blood pressure, high cholesterol and diabetes. Studies have found that physical activity may modify the harmful effects of these other risk factors. For example, Hagberg, Park and Brown (2000) found an inverse relationship between physical activity and blood pressure, with three quarters of patients with hypertension (high blood pressure) achieving reductions in blood pressure through regular physical activity. Stefanick and Wood (1994) showed that a single activity session can result in improved blood lipid profile (cholesterol levels) with effect for several days. Hu, Sigal, Rich-Edwards and Colditz (1999) examined the relationship between total physical activity and risk of diabetes. Over an eight year follow up, their study showed a reduction in the relative risk of developing diabetes as activity increased. Physical activity has also been shown to maintain cognitive functioning in older adults (Weuve *et al.*, 2004). Their findings showed that higher levels of activity were associated with better cognitive performance and less cognitive decline. There has been some debate on the differences between the protective merit of physical activity, versus that of cardiorespiratory fitness (e.g. Wei *et al.*, 1999). This led to a review by Blair, Cheng and Scott Holder (2001). They showed that a measure of cardiorespiratory fitness provides an objective evaluation of an individual's recent activity. Therefore, they believe that fitness is mainly developed by activity and do not think it is important, or even desirable, to try to determine whether physical activity or cardiorespiratory fitness is more important for health. More recent research by Blair and Church (2004) looked at how physical activity is quantified. After reviewing the evidence, they concluded that cardiorespiratory fitness is a stronger predictor than self-report physical activity for many health outcomes. This is because self-report questionnaires can fail to adequately quantify physical activity.

After reviewing the evidence, Blair (1994) suggested that it was reasonable to conclude that a low level of physical activity is one of the important causes of CHD. He also believed that the evidence confirmed that the increased mortality in less active individuals could not be explained by confounding influences or other

established risk factors. Indeed, most studies exclude individuals who have disease at baseline and this should ensure that selection bias (people self-selecting into a sedentary activity category due to genetic or pre-existing disease) is not part of the explanation for the reduced death rates in more active individuals. For example, at eight year follow up, of men without pre-existing CHD, the British Regional Heart Study showed that those who participated in moderate or moderately vigorous activities had a fifty percent reduction in risk, compared to those who were inactive (Shaper, Wanamethee & Walker, 1991). A further follow up with these men after another four years once again demonstrated that all forms of mortality were highest in the inactive group (Wanamethee, Shaper & Walker, 1998). However, some studies on the mortality benefits of physical activity have been criticised for being unrepresentative. These studies include large observational cohort studies that only involve individuals at lower risk of developing cardiovascular disease (e.g. Blair, Kampert & Kohl 1996; Paffenbarger, Hyde, Wing, & Hsieh, 1986). However, other studies have demonstrated the mortality benefits of physical activity in more representative cohorts. The most notable one is the Framingham heart study (Kannel & Sorlie, 1979). This study found that mortality due to cardiovascular disease (particularly for men), was greater in sedentary individuals. A more recent study by Richardson, Kriska, Lantz and Hayward (2004) examined the benefits of physical activity in individuals who had different levels of risk from cardiovascular disease. It included a nationally representative sample of pre-retirement US adults from a wide range of activity levels, health conditions and socio-economic status groups. It found that the relationship between physical activity and mortality was not moderated by cardiovascular risk. That is, regardless of the risk factors an individual may possess, physical activity will always have a beneficial effect on health and longevity. In addition, this study provided evidence that it is those individuals with high cardiovascular risk that gain the most significant benefit from being active. This highlights that physical activity interventions targeted at those individuals at high risk from CHD are particularly important.

Forty years after publication of his seminal work, Morris suggests that, due to the many benefits of physical activity, it may represent “today’s best buy in public health” (1994, p. 807). A review of physical activity and cardiovascular disease by Kohl (2001) concluded that physical activity is prominent in the causal configuration

of factors predisposing to cardiovascular disease, particularly coronary heart disease. However, despite the wealth of studies that have already been undertaken, a full understanding of the pathways that underlie the protective effect of physical activity against CHD, has not yet been reached. Therefore, it has been recommended that further studies need to be undertaken in order to clarify the relationship between physical inactivity and coronary heart disease. Research is needed in order to identify the minimum dose (volume, in terms of intensity, duration and frequency), type (aerobic, strength etc.) and mode (walking, swimming etc.) of activity which is associated with reduced CHD risk (Batty & Lee, 2004; Kohl, 2001). However, a number of studies reviewed by Lee and Skerrett (2001) quantified physical activity in a manner that allowed it to be translated into public health recommendations. They suggest that minimal adherence to either the current or previous physical activity guidelines, both of which will generate a volume of energy expenditure in the order of 1000 kcal per week, is likely to decrease all-cause mortality rates.

2.4 Public health recommendations for physical activity

The most recent recommendation for physical activity is thirty minutes or more of moderately intense aerobic activity, such as brisk walking or cycling on five or more days per week (DoH, 1996; Pate, Pratt & Blair, 1995). This contrasts with previous recommendations that advocated vigorous intensity exercise (e.g. running) for a least twenty minutes, continuously three times per week (American College of Sports Medicine, 1985). The original exercise recommendations were based on scientific studies that investigated improvements in performance capacity after exercise training. Although the recommendations were based on documented improvements in fitness, they also provide the disease prevention benefits associated with an increase in physical activity (Pate *et al.*, 1995). The most recent recommendations for physical activity were not intended to supersede the original recommendations, but to complement them. They were made partly to encourage physical activity among sedentary individuals, since the previous, more difficult recommendation, was believed to pose a barrier (US Department of Health and Human Services, 1996). From a public health perspective, advocating small doses of physical activity is also likely to be more palatable to many physically inactive individuals. However, there are two main difference between the two sets of recommendations. Firstly the more recent recommendation puts an emphasis on moderate rather than vigorous

activity. Secondly, the recent recommendation allows the accumulation of short intermittent bouts of activity rather than one long continuous session. The new recommendation therefore extends the exercise-fitness model to a broader physical activity-health paradigm. It is based on mounting evidence that indicates that the health benefits of physical activity are linked principally to the total amount of physical activity that is performed (e.g. Haskell, 1994; Lee, Sesso & Paffenbarger, 2000; Pate *et al.*, 1995). The evidence suggests, therefore, that the amount of activity is more important than the specific manner in which the activity is performed (i.e. the mode, duration or intensity). For example, Lee *et al.* (2000) found that providing the total energy expenditure is similar, the accumulation of shorter sessions of activity is associated with equivalent benefit (in terms of CHD risk) when compared with longer sessions. This finding is from the Harvard Alumni Health Study, which is a series of periodic surveys that have been carried out by Paffenbarger and colleagues since 1962. The results from this longitudinal study showed a progressive reduction in heart attack rates with increasing total energy expenditure rather than with duration of exercise.

Despite these recommendations, the Health Survey for England (DoH, 1998) found that only 37% of men and 25% of women met the current guidelines for physical activity. It also found that over a third of adults were sedentary and took less than one thirty minute occasion of moderate physical activity per week. In addition, physical activity declined rapidly with age, with only 17% of men and 12% of women in the sixty five to seventy four year age group meeting the current guidelines.

2.5 Sedentary behaviour

Findings from a World Health Organisation (WHO) study on health risk factors, suggest that a sedentary lifestyle is one of the ten leading causes of death and disability in the world (WHO, 2002). Despite the risks associated with sedentary behaviour, Marcus *et al.* (2000) found that 30.7% of American women and 26.5% of American men are sedentary. Sedentary behaviour is more prevalent in older adults, the less well educated, people with disabilities and chronic illnesses. It has been estimated that 36% of deaths from CHD in men and 38% of deaths from CHD in women are due to lack of physical activity (BHF, 2000). In addition, 9% of deaths

from CHD in the UK could be avoided if individuals who are sedentary increase their activity levels to moderate (Britton & McPherson, 2000). Individuals who are inactive are almost twice as likely (1.9 times) to develop CHD than active individuals (Powell *et al.*, 1987). A recent review of observational studies reported that the risk of all cause mortality was 20-30% lower among adults who met the recommended levels of physical activity (Lee & Skerrett, 2001). Indeed, it has been found that older people who adhered to a healthy lifestyle, including physical activity, enjoyed longer life (Knoops *et al.*, 2004).

One explanation for the prevalence of sedentary behaviour is that people have more leisure time than ever before and chose to spend this in sedentary activities (Strum, 2004). Economics has been suggested to offer useful insights into decision making about physical activity behaviour (Strum, 2004; Cawley, 2004). This is because it helps to understand how people allocate their scarce resources of time and money in order to maximise their lifetime happiness. Health is just one factor that contributes to happiness and individuals may be willing to sacrifice this in exchange for other things that they value. Cawley (2004) divides time into a number of categories; sleeping, leisure, occupation (paid work), time in transportation and time spent in home production (unpaid work). This decomposition of time is referred to as the SLOTH model. He suggests that the way individuals allocate time to each of these categories reflects both immediate and future costs and benefits. He also believes that individuals typically assign less importance to outcomes in the distant future than those in the present. For this reason, therefore, individuals may assign little importance to future health consequences when deciding how much time to spend in physical activity.

There is growing evidence to support an independent link between sedentary activities such as watching television or playing video games and risk of obesity, chronic disease and mortality. For example, Hu, Li, Colditz, Willett and Manson (2003) investigated the relationship between sedentary behaviours in women and the risk of obesity and type 2 diabetes. During six years of follow up, they found that watching television was associated with a 23% increase in the risk of obesity and a 14% increase in risk of type 2 diabetes. In contrast to this, half an hour of brisk walking per day was associated with a 24% reduction in obesity and a 34% reduction

in diabetes. Prentice and Jebb (1995) debated whether the rising rates of obesity should be blamed on gluttony or sloth, or both. Having reviewed the evidence, they conclude that there is a much closer relation between obesity and measures of inactivity than there is between obesity and diet. It should not, therefore, be assumed that obesity in affluent societies is largely a matter of greed. Affluence is associated with a decline in energy expenditure as people adopt increasingly sedentary lifestyles where physically arduous tasks have been displaced and leisure time is dominated by television viewing and other inactive pastimes. In fact, watching television was the most common home-based leisure activity in the UK in 1996/7 (Office for National Statistics (ONS), 1998a).

2.6 Physical activity and obesity

Over the past 20 years, the prevalence of obesity has risen dramatically and in 1998 WHO declared it to be a global epidemic. Britain has the most rapidly increasing obesity rate in Europe (Davies, Giles & Rona, 2000). Categorisation of individuals into healthy and unhealthy weights is undertaken using a calculation of body mass index or BMI (WHO, 2000). BMI is a simple and reliable measure of overall obesity however, it does not discriminate between muscle and fat mass (Liu & Manson, 2001). BMI is the ratio of weight to height and is calculated as weight in kilograms divided by height in metres squared. Individuals with a BMI of 30 or over are said to be obese (WHO, 2000). In England, 63% of men and 55% of women are estimated to be in excess of normal weight, with a BMI of 25 or more (DoH, 1998). It has also been estimated that 17% of men and 21% of women are obese. If this present trend continues it is predicted that by 2010, 25% of the population will be obese (National Audit Office, 2001). The audit office also estimates that if there was an increase in physical activity amongst obese individuals, 30,000 lives and £2.5 billion could be saved each year.

Many studies have attributed the obesity epidemic to declines in the average daily energy expenditure. Findings from a review by Hill and Melanson (1999) suggest that a continued decline in daily energy expenditure is not being matched by an equivalent reduction in energy intake. They believe that the primary cause of obesity is environmental changes that have affected energy expenditure. These include a decline in work and household related physical activity and an increase in sedentary

activities such as watching television. Improvements in technology and the proliferation of energy saving devices have also contributed to the decrease in energy expenditure. Their review concludes that a decline in energy expenditure is the most likely factor contributing to the obesity epidemic. They suggest that “increasing physical activity may be the strategy of choice for public health efforts to prevent obesity” (1999, p. 519). In addition, cardiorespiratory fitness or regular physical activity have been found to attenuate many of the health risks associated with overweight or obesity (e.g. Blair & Brodney, 1999; Wei *et al.*, 1999). Wei *et al.* (1999) found that death rates in fit, obese individuals were about one half of the death rates in normal weight but unfit individuals. A systematic review by Blair and Brodney (1999) concluded that active obese individuals actually have lower morbidity and mortality than normal weight individuals who are sedentary. Wessel *et al.* (2004) found that higher reported physical activity scores were independently associated with fewer CHD risk factors whereas, measures of obesity were not independently associated with these outcomes. The findings suggest that focusing on weight loss alone does not address the more important issue of lack of physical fitness among overweight people and that a reduction in obesity does not directly improve physical fitness. Blair and Brodney (1999) concluded that inactivity and low cardiorespiratory fitness are as important as overweight and obesity as predictors of mortality. However, Blair and Church (2004) point out that the debate over the relative contribution of fitness and obesity to overall health and risk of disease may be trivial. This is because regular physical activity is a treatment, and therefore a common denominator, for both low fitness and excess body weight (p. 1233).

2.7 Physical activity interventions

In recent years, numerous studies have investigated the effectiveness of interventions designed to increase physical activity. A review by van der Bij, Lauerant & Wesing (2002) evaluated the general effectiveness of different types of physical activity interventions among adults, aged forty and over. It concluded that whilst interventions can result in increased physical activity, the changes are small and short-lived. It also showed that age seems to influence participation, with people under sixty having lower participation rates when compared to those aged sixty or over. Gender was not found to be an influence on participation, but in general, more women were found to participate in physical activity interventions than men.

Studies have been undertaken with various populations and have utilised different methods and outcome measures, both over the short and longer term. Some studies have recruited participants registered with GP practices (e.g. Harland *et al.*, 1999; Hillsdon, Thorogood, White and Foster, 2002; Taylor, Doust & Webborn, 1998). Harland *et al.* (1999) investigated the effectiveness of a number of different interventions. They found that on-going motivational interviewing, combined with a financial incentive to attend a physical activity venue, was the most effective way of promoting physical activity. However, whilst the interventions were effective in promoting initiation of physical activity, none of them were effective in promoting adherence in the longer-term (twelve months after the ten week intervention). Taylor *et al.* (1998) investigated the effects of exercise on modifiable CHD risk factors. They found that those who achieved a 75% adherence to the intervention (15 out of 20 sessions) received the most benefit and were likely to maintain weight loss and reduction of blood pressure nine months after completion of the ten week programme. Adherence was not related to age, gender, employment status or marital status. The intervention carried out by Hillsdon *et al.* (2002) focused on the provision of information, advice and counselling. They found that those participants who received motivational interviewing increased their activity by 24% more than those who received no intervention. Interactive counselling was also found to be more useful than merely providing information and advice. The participants in these studies did not have any contact with their GP. However, other interventions have just involved the GP (e.g. Eden, Orleans, Mulrow, Pender & Teutsch, 2002; Little *et al.*, 2001a), or have involved the GP as the point of referral into a physical activity intervention (see Riddoch, Puig-Ribera & Cooper, 1998 for a review).

2.8 The general practitioner's role in increasing physical activity

There is a growing body of literature on GP counselling and the effectiveness of the GP consultation on patient outcome (e.g. Barry, Bradley, Britten, Stevenson & Barber, 2000; Little *et al.*, 2001b; Moore *et al.*, 2004; Steptoe *et al.*, 1999; Straub, 2001; Taylor, S., 1999). It has also been suggested that health professionals should ensure patients understand the seriousness of their condition and the consequences of not adhering to a treatment (Ley, 1997). However, lay people typically believe they face less risk than others and view health warnings as less applicable to them

(Fischhoff, 1997). Indeed, this misunderstanding of risk can reduce compliance with treatment. Fischhoff (1997) suggests that one way in which compliance can be improved is by health professionals using communication that detects patients' misconceptions. Patients' perceptions of communication, partnership and a positive doctor approach have been found to be main independent predictors of satisfaction (Little *et al.*, 2001b). This combination has been referred to as a 'patient centred approach' and has been found to influence compliance with treatment or advice (e.g. Weinman, 1997). A randomised control trial of UK patients at risk of CHD found that individuals were significantly more likely to increase regular physical activity in both the short term (four months) and longer term (twelve months) if they received brief behavioural counselling (Steptoe *et al.*, 1999). However, the changes in behaviour were not translated into measurable biological risk factors, such as a drop in blood pressure. The authors concluded that whilst brief counselling does result in change in health behaviour, more extended counselling and support may be needed to translate sustained changes into improvements in biological risk profile. Although a model of doctor consultation that includes communication and partnership has been widely advocated, its use in practice has been found to be rather limited (Barry *et al.*, 2000). This literature is discussed in Chapter 7.

A number of studies have found that the provision of lifestyle advice by GPs has resulted in short-term changes in physical activity (e.g. Ashenden, Silagy & Weller, 1997; Calfas *et al.*, 1996; Imperial Cancer Research Fund OXCHECK study group, 1994; Lawlor & Hanratty, 2001). However, a systematic review of the effect of physical activity advice in primary care concluded that, since the majority of trials have been conducted in the US, these findings may not be applicable to the UK (Lawlor & Hanratty, 2001). A survey of UK GPs found that they had a good knowledge of the health benefits of physical activity and believed they had sufficient knowledge to give advice about it. However, almost all of the GPs cited lack of consultation time as the largest barrier to promoting physical activity and only 8% said they would opportunistically give advice on physical activity to all patients (Lawlor, Keen & Neal, 1999). In fact, this survey found that GPs were significantly less likely to provide advice if they did not believe physical activity was relevant to the consultation or if they believed that patients would not follow their advice. However, one study found that changes in physical activity were sustained for at

least a year (Elley, Kerse, Arroll & Robinson, 2003). This was when the patient had prompted the GP for advice and this had been followed up by ongoing telephone support. Indeed, a report by the United States Preventive Services Task Force (2003) showed that studies examining GP based physical activity interventions have produced mixed results. The findings in this report were summarised by Eden *et al.* (2002). They undertook a systematic review of controlled trials published since 1992, to investigate whether adults counselled by primary care professionals improved or maintained physical activity behaviour. The review also investigated what types of intervention were the most effective for improving or maintaining behaviour. They found mixed and inconclusive evidence to support the case that counselling for physical activity in primary care is effective in the short term. The United States Preventive Services Task Force (2002; 2003) therefore reported that there was insufficient evidence to determine whether physical activity counselling of adults in primary care settings leads to sustained increases in physical activity. It also suggested that the most promising interventions for facilitating and reinforcing healthy levels of physical activity are those which combine provider advice with behavioural interventions (e.g. exercise on prescriptions and specialist assistance by qualified staff).

Whilst GPs are uniquely placed to promote physical activity to patients, this advice may reach some groups of the population more than others. Many studies, for example, report that women consult their GP more frequently than men (e.g. McCormick, Fleming & Charlton, 1995). A national study on morbidity statistics in British general practice found that men in the 16-44 age group, had about half the contact rate with GPs when compared to women and in the 44-64 age group, they had about three quarters that of women (McCormick *et al.*, 1995). Evidence to support women's greater propensity to consult comes from analyses of GP based morbidity surveys. These find that gender differences in rates of consulting are greatest for conditions labelled as 'minor' or 'intermediate', whilst rates are similar for those labelled 'serious' (McCormick *et al.*, 1995; Sayer & Britt, 1996). However, gender differences in morbidity are difficult to measure. This is because categories of morbidity have not been consistently applied across studies and morbidity data collected through community health surveys may be formulated with a gender bias. In addition, service utilisation data is under the control of physicians

and diagnoses are influenced by the way in which symptoms are perceived, evaluated and acted upon (Sayer & Britt, 1996). Sayer and Britt (1996) also point out that by utilising a service, an individual may discover other illnesses that were previously unknown to them. Therefore, the prevalence of morbidity in women may be inflated if they attend for gender specific care and other illnesses are then identified.

A number of potential explanations have been put forward to account for gender differences in consulting a GP. Some studies have argued that once illness is recognised, women are more likely to consult than men, possibly due to being socialised to be dependent and accept help, or to role responsibility for home and family (Hibbard & Pope, 1986). However, others have disagreed with this view and have found no significant gender differences in reporting of the same conditions or illness (e.g. Hunt, Ford Harkins & Wyke, 1999; Kandrack, Grant & Segall, 1991; Macintyre, Ford & Hunt, 1999). Women have been found to be just as reliable as men at reporting symptoms (Bird & Rieker, 1999). It has been suggested that men and women experience health conditions in different ways and this influences their likelihood of consultation (Hunt *et al.*, 1999). Indeed, it has been found that when men and women consult for symptoms of minor illness, they each experience the same symptoms in a different way (Wyke, Hunt & Ford, 1998). In addition, Hunt *et al.* (1999) found that a consultation was not predicted by gender, but by the reported experience of condition. In particular, those reporting pain from musculoskeletal problems were over three times as likely to consult their GP than those without pain. Since women were found to be more likely to report musculoskeletal problems and men were more likely to report cardiovascular problems, this may explain the gender differences in consultation rates. Having said this, paradoxical findings for the relationship between gender, health status and health behaviour were found in a review (Kandrack *et al.*, 1991). This study investigated how the role commitments of men and women may be linked to health. It examined how role attributes (particularly marital status, and social status characteristics such as employment) influence health related beliefs and actions. No significant gender differences were found in terms of responses to minor illness. Men and women were equally likely to ignore illness, take care of themselves, or see a doctor immediately. In addition, there were no significant gender differences in preventive health beliefs or in sense

of control over health matters or ability to prevent illness. However, this study may not have found differences in preventive beliefs since it did not assess the connection between preventive health beliefs and action. Whilst no significant gender differences were found on measures of perceived health status, significant differences were found in illness behaviours. Women tended to engage in more health protective behaviours, including making greater use of medical services and decreasing normal activity or remaining in bed when they felt ill. Regression analysis indicated that gender alone had little explanatory power in accounting for differences in the selected measures of health, illness and sick role behaviour. This review did not, therefore, reach a definitive conclusion regarding whether gender or other social status characteristics, such as education, employment and marital status can account for variation in health related behaviours.

2.9 Exercise referral or 'exercise on prescription' schemes

It is important to distinguish between population strategies designed to increase physical activity and exercise referral or 'prescription' schemes. The principle of exercise referral schemes involves primary care professionals referring (or prescribing) individuals to a programme of exercise. This is typically delivered through an arrangement with local leisure centres. Exercise referral schemes fit well into the new agenda for health improvement and provide an excellent opportunity to address inequalities in health care, disease prevention and enhancement of quality of life (DoH, 2001). In 1998, the Health Education Authority (HEA) commissioned a review to assess the effectiveness of exercise on prescription schemes in the UK (Riddoch *et al.*, 1998). This consisted of three elements. Firstly, a systematic review of the peer-reviewed literature relating to the effectiveness of exercise on prescription schemes. Secondly, it considered internal evaluations of schemes and grey literature. Thirdly, it encompassed three case studies designed to gain a deeper insight in to the wider impact of exercise on prescription schemes, how they are organised, evaluated and perceived. The systematic review found that the majority of studies reported some small but positive improvement in either physical activity or related measures. Data from the grey literature suggested a much greater level of effect. The case studies also suggested wider ranging and more significant effects than the experimental studies. In particular, effects on participants were perceived to be principally in the social and psychological domains.

The need to assess the effectiveness of exercise referral schemes is shown by current NHS focus on evidence based practice. Riddoch *et al.* (1998) found that 91% of schemes were undertaking some form of evaluation. However, many schemes isolated physical activity level as the primary outcome measure, which may not change in the short term. Physical activity is also a complex behaviour and is therefore difficult to measure. Riddoch *et al.* (1998) therefore proposed a pluralistic approach to evaluation with outcome measures that include psycho-social variables and the assessment of mediators of physical activity (e.g self-efficacy). They suggest that these may provide a more accurate estimation of the true impact of schemes. In addition, they stress the importance of longer-term follow up (beyond the duration of a scheme) in order to assess meaningful health gains. The review also recommends that a basic principle in the assessment of effectiveness is to include in the analysis, all participants to whom the intervention was offered. The Riddoch *et al.* review (1998) also highlights how studies which assess biological or physiological outcomes, are of limited use in assessing the effectiveness of health promotion schemes. This is because changes in these parameters tell us little about behaviour change or other potentially healthy outcomes. In addition, a range of confounding factors (e.g. diet and smoking which affect weight, blood pressure and cholesterol levels) can cause difficulty with experimental control. Another argument for not using physiological outcomes as a measure of the effectiveness of an exercise referral scheme is that the selection of appropriate and meaningful physiological measures is difficult (Riddoch *et al.*, 1998). This is because the physiological mechanisms via which physical activity improves health are largely unknown. Taylor (2003) has suggested that there should be a greater use of qualitative methods in the evaluation of exercise referral schemes. This would enable the psycho-social mechanisms by which people change to be fully understood.

A number of studies investigating the promotion of physical activity have employed randomised control designs (e.g. Harland *et al.*, 1999; Taylor *et al.*, 1998). In terms of changes in physical activity, controlled studies tend to provide less positive support for the effectiveness of exercise referral schemes, than feedback from those operating the schemes does (Riddoch *et al.*, 1998). It has been suggested that the randomised control trial may not be a feasible method for evaluation of exercise

referral schemes for several reasons (DoH, 2001). For example, the least active individuals are less likely to enter a study or complete follow up assessments. A randomised control trial may also require modification of the normal referral process and therefore raises a question regarding what is being evaluated (e.g. at what point in the referral process should random assignment of patients take place?). In addition, there are major resource implications involved in conducting rigorous randomised control trials, in terms of equipment/instrument reliability and validity checks, tracking patients for follow up and researcher training. Some studies that have used a randomised control design have been criticised for their use of this methodology. For example, undertaking a baseline assessment of the control group could be interpreted as representing an intervention in itself and may, therefore, dilute the apparent results of the intervention. In addition, the sampling procedure and completion of the study could be affected by self-selection bias. In this situation, those randomised to the exercise groups self-select whether to participate in activity and to what extent they do so. An additional problem with a randomised evaluation design is that of ethics and the issues surrounding the denial of a service to the control group (McQuay & Moore, 1994). It is rare, therefore, that a randomised control trial is successful in health service research. It is suggested that they are not the right way to show that a service/package of interventions is an improvement (McQuay & Moore, 1994).

In 2001, the Department of Health published a national quality assurance framework (NQAF) for exercise referral systems (DoH, 2001). This provides guidelines for exercise referral systems and aims to improve standards in existing schemes as well as helping the development of new ones. The framework focuses on the most common model of exercise referral system, where the GP or practice nurse refers patients to facilities such as leisure centres for supervised exercise programmes. The guidance covers patient selection, evaluation and long term follow up. It suggests that the effectiveness of exercise referral schemes is likely to be greater if staff are trained in behaviour change strategies and are sympathetic to the needs of the sedentary individual who may have additional medical needs. In their review of exercise referral schemes Riddoch *et al.* (1998) suggest that appropriate training of both primary care and referral staff in relevant theory led techniques (such as counselling and motivational interviewing) is needed in order to maximise patient

motivation. In addition, appropriate training for exercise referral specialists is vital to the success and safety of schemes (Riddoch *et al.*, 1998).

2.10 Influences on physical activity behaviour

In their review of the adoption and maintenance of physical activity, Marcus *et al.* (2000) found that early exercise adherence studies carried out with participants at high risk of cardiovascular disease suggest a 50% drop out rate is common.

However, in their meta-analysis examining physical activity interventions, Dishman and Buckworth (1996) found that this 50% success rate improved to 67% after some types of intervention. In particular, this occurred when interventions used behaviour modification strategies, emphasised low intensity activity and used a mediated delivery approach. Buckley, Holmes and Mapp (1999) suggested that the title used for a physical activity intervention might have an impact on drop out rates. The term 'exercise on prescription', which is widely used to describe GP exercise referral schemes in Britain, potentially carries negative connotations of being a temporary fix associated with illness, similar to a prescription of medicine. In addition, the idea of being on an exercise programme may imply that at some point in the future it will cease and failure is often the natural endpoint (Buckley *et al.*, 1999). Marcus *et al.* (2000) have suggested that the high drop out rate reported by many studies may reflect the design of the trials, the type of participant and the frequency of measures rather than other variables such as health complications or declining motivation. Drop out rates may also reflect the fact that many of these early studies focused on structured exercise programmes rather than a lifestyle approach to PA. In addition, the use of a dichotomous measure for adherence will limit the interpretation of the data since drop out from a supervised programme does not always correspond to cessation of exercise. Recent studies are more likely to report percentages of adherence to specified criteria and to specify if adherence includes home based exercise (Dunn *et al.*, 1999). Ley (1997) found that patient reports are more likely to provide a much higher compliance rate than those of more objective methods (78% compliance compared to 46% for more objective methods), therefore rates of adherence to physical activity may be unrealistic if a self-report, patient measure is relied on. He also notes that compliance, or following the advice given by health professionals, involves a complex series of behaviours, each one being subject to non-compliance.

A number of models have been used to study health behaviour. These include the health belief model (Rosenstock, 1974) and protection motivation theory (Rogers, 1975; 1983). Both of these models include constructs of perceived susceptibility (to illness) and perceived severity (consequences of illness). Protection motivation theory is discussed under illness representations (section 2.18). One other model that is also discussed in more detail in section 2.18 is the self-regulatory model (Leventhal *et al.*, 1992). This model says that illness representations play a central role in health behaviour. Health locus of control is one construct that has been used to explore health behaviour (see section 2.19) and social cognitive theory (Bandura, 1986) is a model that has been used in the study of physical activity behaviour. Social cognitive theory suggests that behaviour is governed by expectancies in terms of outcomes (e.g. that a behaviour will reduce harm) and self-efficacy (expectations that a person is capable of carrying out a desired behaviour). In addition to expectancies, behaviour is suggested to be governed by incentives (e.g. consequences) and social cognitions (how individuals process information and their representations of the social world). Mutrie and Woods noted that there is no one single theory that is able to thoroughly explain physical activity and exercise behaviour and “there is still a need to develop a comprehensive theory of exercise behaviour change that informs the development of interventions” (2003, p.137). They found that theories of behaviour change from social-cognitive, behavioural and health psychology have been adopted for the study of exercise psychology. In their view, two theories have received substantial support from research investigations. One of these is the transtheoretical model (Prochaska & DiClemente, 1984). This model has a number of dimensions, including stages of change (see section 2.13), decisional balance (see section 2.14) and self-efficacy (see section 2.15). The second theory is Ajzen’s (1988) theory of planned behaviour (TPB). This theory helps to understand the formation of an intention to exercise. It proposes that whether someone will initiate activity can be predicted by their intentions towards physical activity (attitude and the influence of social norm) and perceived behavioural control. Attitude includes beliefs about the likely consequences of the behaviour and an evaluation of those consequences (e.g. beliefs about the costs and benefits associated with a behaviour and whether it will be enjoyable/unpleasant). Social norm (or subjective social norm) is the perception of what significant others

expect an individual to do. Perceived behavioural control is the perception of how easy or difficult the behaviour will be (it is a function of anticipated barriers to physical activity behaviour and also previous experience of physical activity). The attitude component of TPB has been used to study exercise motivation (Lowe, Eves & Carroll, 2002, see section 2.14). In their review of social cognition models of health psychology Conner and Norman (1998) noted that TPB does attempt to address social and environmental factors (in the form of normative beliefs) and includes an element of irrationality (in the form of evaluations). However, it lacks a consideration of time, the beliefs are not in any order, nor is there any direction of causality stated for the beliefs. In addition, to these criticisms, they found that measures used to assess perceived control have been diverse and also noted that perceived behavioural control is difficult to measure since control may be beyond the influence of the individual. They suggested that the model would be improved by adding other variables such as self-identity and the perceived need to change.

Bauman *et al.* (2002) carried out a review of studies that looked at the correlates of physical activity. They found that there have been hundreds of behavioural studies on physical activity, varying greatly in research design, measurement approaches, populations studied, theories used, variables tested and physical activity outcomes. It is this diversity which makes it difficult to integrate the findings and summarise the literature in this field. The Bauman *et al.* (2002) review also identified that whilst a large number of variables have been found to be consistently related to physical activity, many of them have not been associated with a specific theory (e.g. age, gender, socio-economic status, perceived health, self-motivation and enjoyment of physical activity). In his review of what helps and hinders people becoming more physically active, Biddle (1994) notes that enjoyment is a rather elusive concept. However, enjoyment has been consistently cited as a reason for participation in physical activity (e.g. HEA, 1992). In addition, Clarke and Eves (1997) found that lack of enjoyment of exercise is a prominent barrier to participation for sedentary members of the population. The literature on the influence of enjoyment on physical activity is discussed in Chapter 8. Trost, Owen, Bauman, Sallis and Brown (2002) also carried out a review of the correlates of adult's participation in physical activity. This built on an earlier review of the adult physical activity determinants literature undertaken by Sallis and Owen (1999) that summarised over three hundred studies.

They concluded that a diverse range of personal, social and environmental factors influence adults participation in physical activity. However, none of the reviews found an association between health locus of control (HLC) and physical activity in adults. This finding may reflect the fact that studies have not focused on what makes people start activity. Indeed, in his review of physical activity adoption studies Dunn (1999) says that most studies have focused on self-selected, physically active volunteers, in specific exercise programmes. Thus, whilst data exists on what prevents people from starting a programme and what makes them stop, more needs to be known about what makes them start. In his review of the factors that significantly influence, or may influence exercise behaviour Dishman (1982) found evidence to suggest that attitudes towards physical activity and health locus of control may be important determinants of initial involvement in exercise. However, they did not appear to be related to the adherence process. However, he did find that differences in adherence have been found in individuals representing distribution extremes on both exercise attitude and locus of control. "When these characteristics are dichotomised, individuals who have positive feeling towards exercise (particularly in the health related sense) and who also feel responsible for the consequences of their behaviour, tend to exercise longer and more frequently than their counterparts who hold a less positive view of exercise behaviour and who feel that behavioural outcomes are beyond their control" (Dishman, 1982, p. 241). The inconsistent and small associations between health locus of control and health behaviour have also been suggested to be due to small sample sizes and the over use of correlation as a measure of association (Steptoe & Wardle, 2001). Therefore, when appropriate statistical tests are used, the associations between HLC and health behaviour are suggested to be of a similar magnitude to other psychological factors (Steptoe & Wardle, 2001). Using form B of the multidimensional health locus of control scale (MHLC) with 7000 international students, Steptoe and Wardle (2001) found a significant positive correlation between internal health locus of control (IHLC) and exercise, and a significant negative correlation between exercise and both chance health locus of control (CHLC) and powerful others health locus of control (PHLC). However, the correlations were small and accounted for little of the variance in behaviour. In contrast, the results of Steptoe and Wardle's multivariate logistic modelling showed that individuals in the highest IHLC quartile were 77% more likely to exercise than an individual in the lower quartile. In addition, high

scores on CHLC reduced the odds of healthy behaviour by between 20 – 35% and individuals in the highest powerful others quartile were 40% less likely to have exercised at least once in the past two weeks. A study by Armitage (2003) also concluded that the type of analysis used in studies of multidimensional HLC (MHLC) could account for its poor predictive validity. He found that within person analysis presented a fairer test of MHLC's validity when compared to between persons analysis. Literature relating to HLC is discussed in Sections 2.19 to 2.21.

Trost *et al.*'s (2002) review identified that perceived self-efficacy consistently demonstrated the strongest association with physical activity behaviour. Barriers to activity emerged as a strong influence on participation (e.g. lack of time, too tiring, fear of falling and lack of exercise partners). The most recently published studies identified several new environmental correlates of physical activity, including access to, and satisfaction with, facilities. For example, McDougall, Cooke, Owen, Wilson and Bauman (1997) found that dissatisfaction with facilities was significantly associated with greater levels of inactivity. Overweight or obesity has also emerged as a consistent negative influence on physical activity. Body composition (weight and percentage of body fat) has been found to consistently discriminate between those who adhere and those who drop out of exercise (Dishman, Ickes & Morgan, 1980). Dishman (1982) suggests this may be because the weight bearing nature of most exercise may make it harder for the heavy, fat individual. Alternatively, leaner individuals may have higher adherence rates simply because they lead more active lifestyles prior to the exercise programme and therefore active behaviour is easier for them to reproduce. King *et al.* (1997) also found that healthy, sedentary adults with a high BMI (>27) were at the greatest risk of dropping out of physical activity. Trost *et al.* (2002) identified a number of factors that have been found to be positively associated with physical activity. These include perceived health or fitness, self-motivation, enjoyment of exercise, expected benefits/outcome expectations, social support, physician influence, stages of change and intention to exercise. However, Sutton (1998) suggests that intentions may not be good predictors of behaviour since they may change if unforeseen circumstances arise between the time intentions are measured and the commencement of behaviour. In addition, intentions may only be provisional and people may not engage in real decision making when they complete a questionnaire thus, intentions are only

hypothetical or provisional. Bozionelos and Bennett (1999) also found that attitudes towards physical activity did not consistently predict behaviour in their student sample. This was probably because participants had changed their plans in the time period between measurement of the intention to engage in activity and the time the behaviour was due to start. Trost *et al.*'s (2002) review also found that age and gender were the most consistent demographic correlates of physical activity behaviour in adults, with activity being consistently higher in men than in women and inversely associated with age.

2.11 Age & Gender

In her review of factors associated with physical activity for older adults King (2001) showed that attitudinal barriers such as misconceptions or erroneous beliefs about exercise, such as it must be strenuous or uncomfortable to achieve benefits, had an influence on physical activity. Wilcox and Storandt (1996) also found age to be negatively related to attitude towards exercise. Another factor that has been found to be important in initiation of activity for elderly adults is physician advice (Burton, Shapiro & German, 1999; King, 2001). Burton *et al.* (1999) interviewed over two thousand elderly adults in order to explore the determinants of initiation and maintenance of physical activity. They found that both initiation and maintenance were predicted by younger age, moderate to excellent health and a belief that physical activity was important to health. King (2001) also found that older adults often cited poor physical condition and health as barriers to physical activity. Barriers to physical activity have been found to vary with age among adults. Booth, Bauman, Owen and Gore (1997), for example, found that in Australian adults aged 60 to 78, injury and poor health were the main barriers, whilst among those aged under 40, the main barriers were child responsibilities, lack of time and lack of motivation. Other common barriers included discomfort, fear of injury and misconceptions about exercise. King (2001) suggested that older people (especially women) might be reluctant to attend community gyms and fitness centres due to psychological costs (e.g. social embarrassment and self-consciousness). She found evidence to suggest that activity containing a social component is particularly appealing to older women and that older adults prefer activity that takes place outside of a formal class or group setting, since this frees them from the demands of having to attend a structured exercise class regularly. Older individuals have been

found to expect fewer benefits from participating in physical activity (e.g. Wilcox & Storandt, 1996; Yael & Shulamith, 2004). In fact, rather than expecting benefits, older women have been found to have major concerns about their health and safety when exercising, to feel vulnerable in the exercise setting and believe that physical activity has the potential to do them harm (O'Brien Cousins, 2000). In older populations, King (2001) notes that self-efficacy and knowledge concerning the type and amount of activity, may be particularly important in the adoption phase of physical activity. However, older people have been found to have lower self-efficacy than younger people (Wilcox & Storandt, 1996; Yael & Shulamith, 2004). Studies have also investigated age and health locus of control (see Section 2.19).

Literature on coping is useful in helping to understand how age influences physical activity behaviour. Aldwin (1991) suggests that younger and older adults face different types of health problems and that this results in them using different coping strategies. She believes that as people age, and are exposed to a greater variety of problems, they may learn which types of coping strategies are most effective and become better at coping with difficulties. Leventhal, Suls and Leventhal (1993) have also suggested that during later years, whilst competencies are declining, individuals may learn, through their increasing range of life experiences, to enhance their coping skills, in order to compensate for biological decline. They found that coping procedures varied by age, with adults over 65 reporting less fear and anxiety about illness and more use of problem-focused coping (such as information seeking) in order to reduce risk and emotional distress. Whereas for middle-aged adults, avoidance and delay were found to be the more common coping strategies. Ingledeew, Hardy, Cooper and Jemal (1996) also found that older individuals tended to use more problem-focused coping. Their study also identified gender differences in coping styles. Whilst the findings from the gender and coping studies have not been consistent it has been suggested that women seem able to select more appropriate coping mechanisms than men, for example, by selecting problem solving for situations that can be controlled and avoidance for uncontrollable situations (Weidner & Collins, 1993). Indeed, when women's physical wellbeing was threatened, they reported more vigilant strategies than men did, suggesting that women may engage in more adaptive coping than men, when faced with physical threats. Gender difference in coping with chronic, but relatively controllable events

are inconsistent. However, men appear to be better at coping with short-term events because they use avoidance, whereas women adjust better to severely stressful events and report paying more attention to threats to their physical wellbeing than men. Weidner and Collins (1993) believe that women's greater use of attention (vigilance) when faced with physical threats is adaptive and by paying attention to their physical well being, this may increase their likelihood of seeking medical care early. Helgeson and Reynolds (2002) suggest that chronic illness presents different challenges for men and women in terms of the traditional gender roles. The traditional male role may have difficulties expressing emotion and vulnerability that may result from chronic illness and coping with the physical limitations of chronic illness. Since self-control and independence are features of the traditional male gender role, psychological reactance may result when orders are received from the medical profession. The traditional masculine male may therefore be most vulnerable to non-compliance with medical advice. However, some characteristics of the male gender role may help coping with chronic illness, for example, if the illness is viewed as a problem that has to be solved. Chronic illness may threaten the care giver role which is central to the traditional female self-esteem. The traditional female gender role may perceive that caring for themselves undermines caring for others, therefore conflict between receiving support for their own illness and providing support to others may be particularly difficult for women and they will neglect their own health in favour of helping others. On the positive side, the female role allows reliance on others for support and will seek help.

Gender differences have been found in factors that influence the adoption of exercise (e.g. Biddle, Goudas & Page, 1994; Sallis, Hovell & Hofstetter, 1992). Biddle *et al.* (1994) found that, for women, exercise participation was predicted by attitudes towards exercise, perceived control over their lives in general, assessments of the benefits of exercise and self-efficacy. However, for men, the only predictor was attitude towards exercise. Sallis *et al.* (1992) concluded that interventions may need to be different for men and women, for example, those emphasising social support may be more successful for women whilst those targeting the physical environment may lead to greater success for men. Men have also been found to be more efficacious than women (Clarke & Eves, 1997; Yael & Shulamith, 2004). Thus, it is not surprising that by tailoring the content of an intervention to the socio-

psychological barriers relevant to women, physical activity has been found to increase during an intervention and also to be maintained after an intervention (Segar, Jayaratne, Hanlon & Richardson, 2002). Backett (1990) found that women were less likely to exercise regularly than their male partners. These differences frequently did not correspond with desired levels of exercise, but reflected women's negotiated role within their family and to them giving a higher priority to other family commitments than to their own participation in regular exercise. Findings from the Allied Dunbar national fitness survey (HEA, 1992) reported gender differences in barriers to physical activity. Whilst both men and women believed time was a barrier, men were more likely to report that lack of time was due to work, whereas women reported it was due to looking after young children. When asked why they had stopped regular activity, women were significantly more likely than men to give reasons associated with childcare and marriage, suggesting that women's larger share of the domestic duties account for their drop out from exercise. In addition, women were far more likely than men to report both emotional and motivational barriers to becoming more active (e.g. too shy or embarrassed; perceiving themselves not to be the sporty type). They were also more likely to report not having the energy to take more exercise and to believe that they would never keep it up. However, the survey did not find any difference in the overall physical barriers reported by men and women. Hardcastle and Taylor (2005) found that older women began to view exercise as central to who they were and their weekly routines when they developed an identity as an exerciser. Characteristics of an exercise identity were prioritising exercise and promoting it to others and habitual scheduling. Several influences were found to contribute to development of an exercise identity. These were feelings of achievement, autonomy and feelings of control, social interaction and a sense of belonging. In building this identity, women were able to resolve conflict with respect to their competing roles and identities and to exercise without feeling guilty. Their research indicates that perceptions of family and domestic commitments can change through participating in exercise and building a new identity. Hardcastle and Taylor (2001) also provided some insight into how older women experienced a GP exercise referral scheme. Their findings highlighted the importance of psychosocial dimensions and informal networks in the referral process (perceptions of control and accountability, sources of beliefs about exercise, social support, ageism and social norms, life-stage support and support networks).

2.12 Barriers to physical activity

Sallis *et al.* (1986) have suggested that, when predicting adoption and maintenance of activity, perceptions about the barriers to maintaining physical activity are more important than perceptions about perceived benefits. In his review of physical activity Dunn (1999) found that over two hundred studies have examined barriers to physical activity adoption, or have studied dropping out of physical activity. The Allied Dunbar national fitness survey (HEA, 1992) gathered data on factors that stop people being more active. It identified numerous barriers and categorised these into five themes as follows: 1 Physical (injury; disability; over weight; poor health; too old). 2 Emotional (not the sporty type, too shy / embarrassed, might get injured). 3 Motivational (need to rest and relax, no energy, never maintain it, do not enjoy it). 4 Time (do not have time due to work / children). 5 Availability (no one to do it with, can not afford it, no suitable facilities nearby, not got the right clothes / equipment). The survey also found that self-perception of activity levels was a barrier. In particular, people were generally not aware of the need to exercise above their current level in order to achieve improved health benefits and functional performance. In addition, they believed their activity and fitness was high, even when their reported levels were very low. Steinhardt and Dishman (1989) proposed that barriers should be classified into four broad categories (effort; time; health limitations and obstacles). In addition, Sallis *et al.* (1989) identified the perception of exercise as not enjoyable as a prominent barrier. In a study of sedentary participants referred by their GP to a 12 week prescription of exercise, Clarke and Eves (1997) identified four main barriers to exercise. These were 'lack of time', 'lack of support', 'dislike of exercise', and 'lack of facilities'. Dislike of exercise was a significant predictor of lack of behaviour change. Lack of facilities was a more significant barrier for those who were preparing to change their behaviour. Clark (1999) explored physical activity in socially disadvantaged and vulnerable adults, aged over fifty five. He found that lower levels of physical activity were associated with lower self-efficacy, greater symptoms and motivational barriers. Motivational barriers were not enough will power, lack of interest and not enough time. However, the most frequently mentioned and most significant barriers were found to be symptom related. These were pain (knee pain, back pain, and hip pain), shortness of breath and fear of chest pain. In addition other symptom barriers were no energy and swelling.

Marshall and Guskiewicz (2003) investigated what they referred to as “the hidden cost of a healthy lifestyle” and suggested that, “more exercise will mean less obesity related disease, but exercise related injuries may negate the gain” (p.100). The risk of injury from physical activity has been identified as an important concern for public health (e.g. Conn, Anest & Gilchrist, 2003; Marshall & Guskiewicz, 2003). Indeed, when the US surgeon general’s report published the recommended guidelines for physical activity, it also identified that risk of injury was a major negative consequence of increasing the levels of physical activity in the population (US Department of Health & Human Services, 1996). Marshall and Guskiewicz (2003) found that 28% of working adults lost at least one day a year from work due to sports injuries. However, physical activity has also been found to reduce the incidence of injury. The panel on falls prevention (American Geriatrics Association, 2001), for example, reported that regular physical activity has the benefit of reducing the risk of fall injury in older adults. Analysis of injury data from the US national electronic injury surveillance system showed that men were far more likely to sustain injury than women, although fractures, sprains and strains were most common in women (Gerson & Stevens, 2004). In this study, exercise was the activity found to be most likely to result in injury (e.g. walking, running, equipment and exercise classes). In his review of studies that have examined risk of injury Shephard (2003) noted that adequate statistics have not yet been developed to rank activities in terms of their risk. He suggests that once this is done, it will enable those activities where the ratio of health benefit to risk is high to be promoted. Similarly, Marshall and Guskiewicz (2003, p. 101) conclude their review of injury by suggesting that “there is an urgent need for specific guidance on which physical activities confer the greatest health benefits in terms of preventing disease, whilst minimising the risk of injury”. In addition, they propose that physical activity guidelines should be produced that minimise the risk of injury whilst maximising the public health gain from prevention of obesity and other inactivity related diseases.

The most common risk associated with physical activity in adults is musculoskeletal injury (Hootman, Macera, & Ainsworth, 2002). The writing group for the activity counselling trial research group (2001) found that in the two years following consultation with a GP 60% of patients reported musculoskeletal events and 3%

required hospitalisation. This was despite the fact that patients were instructed to gradually increase their physical activity. In addition, 29% of patients reported potential cardiovascular events during the study. These findings are in line with others that show that the risk of physical activity resulting in a cardiac event is greatest amongst the least active individuals. This is particularly the case when they undertake unaccustomed vigorous physical activity (Giri, Thompson & Kiernan, 1999). Exercise related injuries have been found to be greater in high intensity exercise than in the low intensity exercise (Perri *et al.*, 2002). However, they suggest the mode of exercise, rather than the intensity, may be responsible for high rates of injury and subsequent poor exercise attendance. Pollock (1998) found that middle aged sedentary individuals, particularly those who are overweight and unfit, may be particularly susceptible to injuries from high intensity exercise, even when this consists of fast paced walking. He suggests that the physiological feedback from high intensity exercise such as fast paced walking (e.g. increased heart rate, shortness of breath) may be perceived negatively by sedentary individuals and may lead them to believe that a goal of regular high intensity exercise would be difficult to achieve. Pollock (1998) concluded that exercise prescription of moderate intensity was associated with greater adherence partly because of the higher injury rates that accompany vigorous intensity activities. This observation regarding greater risk of injury in higher intensity activity is consistent with a more recent review by Dishman and Buckworth (1997), where injury occurrence was suggested to have a strong influence on maintenance of physical activity.

It should be noted that many findings relating to injury are from studies that only involve GP counselling and, therefore, exercise was not done under a supervised programme. Eden *et al.* (2002) reviewed the potential harms associated with counselling patients to increase physical activity. They note that many physical activity studies exclude patients who have a risk of health problems, in order to avoid injury. Or alternatively they only offer moderate exercise. Buchner and Coleman (1994) found that in older adults, with a low risk of injury, injuries were rare during supervised exercise training. Evidence that supervised programmes can reduce the risk of injury, was also found by Timpka, Lindqvist, Ekstrand and Karlsson (2005). Their study investigated the impact of a WHO safe community programme, on sports injuries. They found that in the areas that had the

intervention, there was a significant decrease in injury rate. After reviewing the potential harms associated with physical activity, Eden *et al.* (2002) suggested that people who stop exercising and drop out of supervised programmes do so because they experience some harm. This finding is supported by Verbunt *et al.* (2005). They examined the association between physical activity, onset of pain and fear of movement, injury and re-injury. The findings showed a significant correlation between onset of pain and fear of movement, injury or re-injury. Therefore, pain had a negative impact on physical activity since people were afraid of re-injury. Some studies have found that injury is the most common reason for relapse from exercise (e.g. Sallis *et al.*, 1990). In addition it also appears to be a strong influence on maintenance or drop out from regular physical activity (Hofstetter *et al.*, 1991).

Adherence to physical activity has been found to be influenced by programme related factors. These include the format of the exercise (King, 2001) and the exercise environment/setting (Dishman, 1982; King, 2001; McAuley, Blissmer, Katula & Duncan, 2000; Turner, Rejeski, & Brawley, 1997). However, being given a choice of exercise, rather than an enforced choice, has not been found to influence adherence (Patten, Armstrong, Martin, Sallis & Booth, 2000). For older adults, adherence is improved when the programme is simple and convenient to engage in (King, 2001) and provides for social interaction (King, 2001; Turner *et al.*, 1997). Exercise carried out in a group setting, where there is opportunity for social interaction, has been shown to enhance perceptions of capability (e.g. Katula, McAuley, Mihalko & Bane, 1998; McAuley *et al.*, 2000; Turner *et al.*, 1997). However, Dishman *et al.* (1980) suggest that the exercise setting, the exercise leader or interpersonal relations between participants may only exert a minor influence upon adherence behaviour. Indeed, Dishman (1982) found little evidence to support the exercise setting as a factor that influences adherence, although he suggested that convenience or accessibility of the exercise setting is a major influence. Another programme related factor that has consistently been shown to influence adherence to exercise is its intensity (e.g. McAuley *et al.*, 2000; Perri *et al.*, 2002; Pollock, 1998). Whilst frequency of activity has not been found to influence adherence to exercise, moderate intensity activity has been found to produce better adherence to exercise prescription (Perri *et al.*, 2002). The findings from this study support the results from earlier research (Dishman & Buckworth, 1996; Sallis *et al.*, 1986). Sallis *et al.*

(1986) found that approximately 30% of those adopting moderate activity dropped out within one year compared to 50% of those adopting vigorous activity.

Adherence and maintenance of vigorous or moderate intensity activity have also been found to be influenced by different factors (Sallis *et al.*, 1986). Adoption of vigorous activity was predicted by young age, male gender and self-efficacy, whilst adoption of moderate activity was predicted by health knowledge. On the other hand, maintenance of vigorous activity was predicted by attitude towards physical activity barriers and maintenance of moderate activity was predicted by specific exercise knowledge, female gender and self-efficacy. Men were found to be more likely to adopt vigorous activity, whereas women were more likely to maintain moderate activity.

2.13 Stages of Change

Many of the early models that attempt to understand behaviour change do not acknowledge the passage of time as individuals move through the process of changing their behaviour. However one model that does take a process view is the transtheoretical model (Prochaska & DiClemente 1984). The Health Education Authority in England promote the transtheoretical (or stages of change model) for use in behaviour change training for health professionals, since it can be used as a tool for helping people to overcome barriers to a physically active lifestyle. The model suggests that individuals engaging in a new behaviour move through a series of five stages of change (pre-contemplation or no intention to change, contemplation or seriously considering change, preparation or making small changes to behaviour, action or actively changing behaviour and maintenance or sustaining behaviour change over time). The stages of change model has been applied to exercise adoption and maintenance (e.g. Clark & Eves, 1997; Marcus, Rossi, Selby, Niaura & Abrams, 1992; Marcus *et al.*, 1998). However, a recent review found that the model has been used in physical activity interventions with mixed results (Eden *et al.*, 2002). People have been found to use at least ten change processes (strategies/techniques) during the initiation and maintenance of physical activity, with those in the pre-contemplation stage using the least (Marcus, Rossi *et al.*, 1992). Physical activity has also been found to increase when an intervention is matched to an individual's motivational readiness to change (Marcus *et al.*, 1998). This led Marcus *et al.* (2000) to suggest that 'one size' fits all programmes are rarely as effective as programmes

that tailor treatment to at least some aspect of the individual group, such as their motivational state. Some support has been found for using the stages of change model in the study of exercise on prescription (Clarke & Eves, 1997). However, this study found that it is possible that research into exercise behaviour in the UK, and in particular that involving GP samples, may fail to attract those with no intention to change (pre-contemplators). These may be individuals who are referred but fail to attend. Thus, this finding has implications for using the stages of change model in intervention studies. Clarke and Eves (1997) based their support for using the model on the proposal that two aspects of social cognition are associated with the stages of change, namely decisional balance (decision to exercise) and self-efficacy. They suggest it is important to consider these factors when studying exercise on prescription. Indeed, the transtheoretical model has been criticised for its lack of detail about the cognitive mechanisms within each stage (Schwarzer, 1999). In addition, whilst the model implies that different types of cognitions may be important at different stages in the health behaviour change process, Schwarzer suggests that the stages are actually arbitrary distinctions within a continuous process. In order to address these failings, he put forward the health action process model (Schwarzer, 1992). This proposes that health behaviour has two distinct phases, motivation and volition (or action). Schwarzer (1992) suggests that three major cognitions operate during the motivation phase. These are risk perception, outcome expectancies and perceived self-efficacy. Whilst risk perceptions can lead to contemplation and motivation to change, Schwarzer (1992) believes that they must be accompanied by the other two cognitions in order for contemplation to be translated into intention to change. During the motivation phase, individuals will weigh up the pros and cons of taking action.

2.14 Expected benefits/outcome expectations

Cognitive processes, such as thinking about the pros (advantages) and cons (disadvantages) of behaviour, have been found to influence motivation to initiate behaviour. Social cognitive theory (Bandura, 1986), for example, suggests that an intention to become more active may be influenced by both positive thoughts such as pros, benefits and positive outcome expectancies, and by negative thoughts, such as cons, barriers and excuses about the behaviour. Bandura's (1986) social cognitive theory proposes that people adopt a behaviour such as physical activity if they

believe they have much to gain and little to lose (i.e. they consider both positive and negative outcomes). However, Lowe *et al.* (2002) highlighted the importance of affective evaluations (emotional judgements about the consequences of behaviour). This component of attitude towards behaviour was suggested to be key influence on adoption of regular exercise. Marcus, Rakowski and Rossi (1992) suggest a simple, two-factor structure, for decision making that is based on positive perceptions of the behaviour (pros) and negative consequences (cons). These two factors have been associated with the stages of behaviour change model (Prochaska & DiClemente, 1984). For example, Marcus and Owen (1992) found that people who had no intention to change (pre-contemplation) and those who were considering change (contemplation) perceived the negative consequences of exercising (cons) as greater than the positive perceptions (pros). Whereas in those individuals making small changes to behaviour (preparation stage), the pros and cons were roughly equal. However, for those actively changing (action and maintenance stages), the pros were greater than the cons. Clarke and Eves (1997) identified that a decisional balance measure encompassing pros and cons, was a critical component in the modification of exercise behaviour. When this was applied to the stages of change model (Prochaska & DiClemente, 1984) there was a perception of benefits of exercising rising across the stages and of the costs of exercising decreasing across the stages. For example, pre-contemplators perceived that any benefits would be outweighed by the costs of changing behaviour, whilst those in the action and maintenance stages perceived that any costs were outweighed by the benefits of exercising. If the pros of exercising are increased and the cons are reduced, it is possible that an individual will move through the stages of change. However, Clarke and Eves (1997) found that those patients who intended to start exercising did not perceive significantly higher benefits from exercising than did those who had no intentions of exercising. This may reflect the influential nature of the GP intervention, in that the GP enables people to consider change although they do not perceive any benefits. The idea of using balanced decision making (weighing up pros and cons) to enhance the adoption of physical activity is not a new one. Wankel and Thompson (1977) found the use of a decisional balance sheet relating to considering the pros and cons of attending physical activity had an immediate and positive effect on exercise attendance. They suggest that considering the positive outcomes of physical activity may have a self-persuasion effect.

Laffrey and Isenberg (2003) proposed that an important condition for taking action is that individuals perceive it is worthwhile and have some expectation that the action will produce reinforcement value. In his review of behaviour change and maintenance Rothman (2000) also proposed that the decision to initiate a new behaviour is dependent upon whether favourable expectations about future outcomes are held. However, he suggests that the decision to maintain is dependent upon perceptions of satisfaction with the outcome and whether it is sufficiently desirable enough to warrant continued action. Indeed, Dzewaltowski (1989) found that self-evaluated dissatisfaction with outcomes was a significant predictor of physical activity (individuals who were satisfied with the outcome exercised more than those who were less satisfied). However, according to social cognitive theory, as individuals become satisfied with their performance, some motivation will be lost (i.e. there is a need for an individual to be dissatisfied with their current standing in order for them to be motivated to persist). Maintenance of physical activity has been suggested to be facilitated when individuals aim to preserve a favourable situation and avoid a less favourable one (Rothman, 2000). However, this may be undermined by overly optimistic expectations. Rothman (2000), therefore, suggests that if individuals aim to avoid a health threat, they may find it hard to initiate behaviour however, they will also have more modest expectations and, therefore, be more likely to maintain the behaviour. Boulton's (2000) review suggests that maintenance of a change in behaviour may also be undermined by previously learned behaviour. Thus, since cardiovascular risk behaviours are learned in multiple contexts, it may be necessary to change a large number of contexts in order to enable maintenance of behaviour change.

In a qualitative study of physical activity in older Canadians, O'Brien Cousins (2003) found that inactive respondents generally had more negative thoughts than positive thoughts. She also found that whilst both inactive and active people expressed an array of barriers to participation in physical activity, the active ones seemed to counter every negative thought with a strong positive dialogue and every barrier with a solution. In addition, her findings showed that active older adults had clear goals in mind, held strong values for their activity choices and perceived few concerns or doubts about their involvement. They also made regular commitments

to be active by making time and planning for activity and making physical activity a high priority. According to Bandura (1986; 1997), thoughts that are experienced when deciding to undertake a specific behaviour may influence perceptions of self-efficacy. Gyurcsik and Brawley (2000) found that university participants in a supervised/structured exercise setting, who were mainly positive in their acute thinking when deciding whether to exercise, were significantly more confident in their ability to actually attend exercise (i.e. acute thoughts were predictive of self-efficacy). In addition, they also had a better rate of adherence than those individuals who thought mainly about the negative aspects of exercising (self-efficacy was found to predict exercise intention and behaviour). Dzewaltowski (1989) found that outcome expectations did not predict physical activity behaviour over and above self-efficacy. He suggests this is because all individuals may value and expect some reward from exercise and because outcome expectations may provide the incentive to allow other cognitive mechanisms to mediate physical activity behaviour. Norman (1995) also examined outcome expectancies and behaviour, although he referred to these as behaviour specific efficacy beliefs. He found a significant correlation between these and taking regular exercise and proposed that to perform a behaviour: "individuals would have to value their health, believe that the behaviour would promote their health and believe that they could perform the behaviour" (p. 217).

2.15 Self-efficacy

Self-efficacy (a belief in capability to carry out physical activity behaviour) has been found to be associated with both initiation and maintenance of activity (Bandura, 1986). This literature is discussed in more detail in Chapter 8. Self-efficacy has been found to relate to the stages of behaviour change, with those in the maintenance stage exhibiting the highest self-efficacy (Marcus & Owen, 1992). However, in a population that was prescribed exercise by a GP, no differences between self-efficacy scores and the stage of behaviour change were found (Clarke & Eves, 1997). This may have been because the population in the study evaluated their health as needing intervention by a GP and when referred to exercise, they may have considered themselves to be contemplating change. The distinction between the stages of change in terms of self-efficacy may therefore have been contaminated or eliminated by the GP referral. Sallis *et al.* (1989) reasoned that in a cross sectional

design, self-efficacy is tautologically related to behaviour. They argue that the use of exercise self-efficacy as a predictor of behaviour in a previously non-exercising population may be inappropriate. This is because the absence of recent exercise experience may render participants' estimates of their own ability unreliable. Other studies have also excluded a measure of self-efficacy in sedentary participant groups on the basis that an accurate determination of self-efficacy requires some experience of the behaviour regime in question (e.g. King *et al.* 1997). Self-efficacy may influence behaviour and also be influenced by behaviour (Garcia & King, 1991; Rothman, 2000). Therefore, it may alter as people engage in behaviour change.

2.16 Self-motivation

Another factor that has been suggested to be amenable to change as a function of exercise experience is self-motivation (Dishman, 1982). The assessment of self-motivation is largely based on self-perceptions of perseverance behaviour. Thus, an individual may be low in self-motivation initially but have their exercise behaviour enhanced via other means and therefore come to believe that adherence is self-motivated. Dishman (1982) has suggested that some individuals are motivationally predisposed to persist, regardless of whether a goal is reached or not. In his review of the factors that significantly influence exercise behaviour he says that: "certain individuals simply appear better able to stay with a behavioural prescription. This predisposition might relate to an ability for self-reinforcement or self-motivation of behaviour which is somewhat independent of extrinsic consequences of that behaviour" (p. 241). He found that a self-motivation trait is a significant determinant of exercise adherence. He describes this trait as "a socially learned characteristic which is dependent upon the capacity for self-reinforcement and the ability to delay gratification" (p. 242). Dishman *et al.* (1980) developed a measure of self-motivation (the self-motivation inventory) and assessed its relationship to physical activity adherence in undergraduates. They found that the decision to adhere or drop out of a prescribed exercise programme was affected by the behavioural disposition of self-motivation (perseverance and will power). Self-motivation scores were found to accurately classify participants according to their adherence status in 80% of all cases and to account for nearly 50% of the variance in exercise adherence behaviour. However, Garcia and King (1991) did not find self-motivation to be associated with exercise adherence in a sample of older, sedentary individuals. However, they say

that “there is a growing conviction that, given the complexity of exercise behaviour and the myriad of factors that influence the decision to exercise, it is questionable whether any single characteristic would explain more than a small percentage of the variance” (p.396). Their study concluded that when attempting to predict exercise adherence, an approach that focuses on personality traits, such as self-motivation is not as useful as a social-cognitive approach, in particular one that includes self-efficacy as a predictor. Wilcox and Storandt (1996) used Dishman *et al.*'s (1980) self-motivation inventory in their study to compare women who exercised with those who did not. Self-motivation was found to be higher in the women who exercised. However, no relationship was found between age and self-motivation.

2.17 Health perceptions

Another factor that has been found to be associated with physical activity behaviour is self-assessment of health. Self-assessed health status has been found to be related to physical activity behaviour and to be an indicator for it (Kasmel *et al.*, 2004). In addition, one significant factor that contributes to good perceived health is frequent physical activity (Seitsamo & Klockars, 1997). Self-assessed rating of general health is a measure that has been widely used as an indicator of health status. It is an explicit assessment of overall health and has been used as a measure in the General Household Survey for many years. Individuals are typically asked to rate their general health against five or six categories (excellent to poor). Whilst this measure does not provide information about the level of specific components or dimensions of health, its advantage is that it automatically incorporates the values of the respondent (Bergner & Rothman, 1987). It assesses an unknown array of perceptions and weights them according to equally unknown and varying values and preferences. Self-ratings do, however, provide a simple, direct and global way of capturing perceptions of health. They do this via using criteria that are as broad and inclusive, as the responding individual chooses to make them.

Interest in the study of self-rated health, as a predictor of mortality in population-based longitudinal research, has flourished since the early 1980's (see reviews by Benyamini, Leventhal & Leventhal, 1999; Idler & Benyamini, 1997). The 1999 review identified twenty seven studies where global self-rated health was found to be an independent predictor of mortality in nearly all of them. One of the first studies

showed that elderly Canadians' self-ratings of health were better predictors of seven-year survival than their medical records or self-report of medical conditions (Mossey & Shapiro, 1982). Unfavourable assessment of overall health is therefore associated with increased risk of death, even after controlling for other factors, such as socio-economic status, physical health, functioning and chronic condition. Many studies incorporating self-rating of health have focused on the elderly and differences between genders. Findings from a US longitudinal study of ageing showed that older people's self-assessed general health was predictive of functional decline and mortality (Lee, 1999). Other longitudinal studies have found that self-perception of health improves as people age (Idler, 1993; Seitsamo & Klockars, 1997), indicating that, in comparison to younger people, older people may have lower criteria for good perceived health. Indeed, it has been suggested that younger and older adults may each use different frames of reference when they judge their health (Benyamini, Leventhal & Leventhal, 2003). Whilst elderly peoples' health perceptions have been found to be complex, one common factor that they take into account with assessing their health is the ability to be active, do what they want to do and be energetic (Benyamini *et al.*, 2003). Indeed, earlier research has shown that a functional/vitality core of the subjective perception of health accounts for a large proportion of the variance in self-assessed health and its validity as a predictor of mortality (Benyamini, Leventhal & Leventhal, 2000). It has been suggested that older people who assess their health as fair/poor are ill people who mainly judge their level of illness. Whereas, those with the higher levels of self-assessed health are people who may suffer from some health problems, but are not seriously sick and could be judging their level of health (Benyamini *et al.*, 2003). However, Self-assessed health has been found to be a better predictor of mortality for elderly men than for elderly women (Benyamini *et al.*, 2000). Benyamini *et al.* (2000) suggested that a possible explanation for this difference is that women base their self-assessment on a wider range of health and non-health related factors. Men's self-assessed health judgements reflect mainly serious life threatening disease (e.g. heart disease), whereas women's self-assessed health judgements reflect both life threatening and non-life threatening disease (e.g. joint disease). However, a UK study has shown that there is little difference between men and women in the self-assessed reporting of health, until they reach the age of eighty (Arber & Cooper, 1999). After this age women reported poorer health than men. Whilst this study

found little difference between genders, it did find age differences in health ratings. The proportion of older people rating their health as less than good, rises from approximately a half of men and women in their early 60's to about two thirds aged 75 and over. After adjusting for the differential social position of men and women, this study also showed that older women were more likely to experience functional impairment in mobility than men of the same age. This research therefore highlighted a paradox. That minimal differences in self-assessed health co-exist alongside substantial gender differences in disability.

One factor that has been shown to influence perceptions of health is how an individual views their symptoms (or their illness representations). Indeed, Dishman (1982) suggests that it is important to consider how aspects of symptoms relate to perceived feeling states in exercise programme participants. In particular, if the disease is visible to the participant, i.e. there are some symptoms which could be classed as 'disability', they are more likely to adhere (i.e. it is how they feel that is important). Leventhal *et al.* (1992) suggested that lay models of health threats can help to understand adherence to treatment regimes. In particular, perceptions of vulnerability to disease and of negative consequences from disease may motivate individuals to adhere. They summarised the empirical themes that have emerged from studies of adherence to medical regimes and proposed that it is the attributes of an illness representation that shape how individuals cope with, or control their illness. However they point out that illness episodes are constantly changing, therefore the somatic sensations (or symptoms) produced by a disease may increase or decrease, or cycle over time. They suggest that as symptoms change, individuals will be constantly updating their coping and appraisal processes.

2.18 Illness representations

Leventhal *et al.* (1997) propose that models of health behaviour should differentiate between health threats and contain constructs such as representations of disease. Leventhal *et al.* (1992) developed a self-regulatory model as a framework for interpreting adherence to health behaviours. This model emphasises the central role of illness representations in guiding adherence decisions and suggests that health related behaviours, or coping responses, are influenced by an individual's beliefs or representations of the illness. Leventhal *et al.* (1992) showed that when people think

about illness, they appear to organise their thoughts around five key questions (What is it? How long will it last? What caused it? How will it/has it affected me? Can it be controlled or cured?) These form the representation of their illness. Leventhal and Benyamini (1997) propose that behaviour is motivated by the representation of an illness (or common sense beliefs about it). The five attributes of the representation, which relate to the five key questions, are identity (the symptoms and label of the illness), time line (time for the illness to develop and its duration), causes of the illness, consequences of the illness, and controllability of the illness. Leventhal *et al.* (1993) proposed that it is the way in which individuals appraise and make attributions about their health that influence how they cope with it. The self-regulatory model suggests that health-related decisions are dynamic, rather than static, as social cognition models would suggest. It proposes a fluid framework in which beliefs and behaviour interact in a dynamic way. Indeed, others have argued that health behaviour does not result from static decisions made at one point in time, but that decisions are made in stages (e.g. Schwarzer, 1992). The self-regulatory model suggests that selection of a coping procedure (e.g. to take part in physical activity or not) is determined by beliefs about the nature of the illness threat. In addition, it proposes that individuals will also evaluate the efficacy of their coping strategy (e.g. whether adherence to physical activity was beneficial). Thus, the model provides a very useful framework for understanding intentional non-adherence. However, Leventhal *et al.* (1993) believe that a key feature of coping is its situational specificity. Thus developing a comprehensive model of coping may be a difficult task.

Carver and Scheier (2002) explored how the processes of coping can influence the management of chronic illness (such as CHD) and what self-regulation models can tell us about this. They suggest that self-regulation (e.g. efforts and giving up) provides an insight into the nature of coping. Efforts to move forwards will be made, for example, if expectations are favourable, however, if doubts are strong there will be disengagement and quitting. Another element of self-regulation is scaling back of goals, which equates to limited disengagement. Rather than quitting, people trade a threatened goal with a less demanding one. Selecting a goal that is manageable ensures it is still possible to move forwards and despite adversity, an individual experiences more positive feelings than they would have if they had

disengaged from the behaviour. Carver and Scheier (2002) believe that the principle of scaling back, or partial disengagement without completely abandoning the goal, is a very important in supporting adaptation to chronic illness. They also suggest that before acting, people weigh options and consider the consequences of these options. Therefore, a decision about how to cope will partly depend upon the level of confidence or doubt about whether a particular way of responding will help them with their goal. When people doubt they will succeed, they tend to give up prematurely and withdraw efforts to move forwards. They may still remain committed to their goal, but not to moving towards it and hence experience distress. Likewise, an individual will also suffer distress if they struggle for too long towards unattainable goals, are unable to let go yet cannot move forwards. The commitment to the old goal may prevent individuals from responding to new opportunities. Carver and Scheier (2002) insist that giving up can be an adaptive response to self-regulation if it leads to taking up other goals and therefore continuation with moving ahead.

Since coping with illness involves different procedures Leventhal *et al.* (1997) prefer to use the term procedures rather than coping. They suggest that every procedure (e.g. taking part in physical activity) has an associated outcome expectation and a time frame. Individuals are likely to question the efficacy of behaviour if the time frame associated with it exceeds expectations. If a response to a health problem is ineffective, works too slowly, for too brief a time period or does not work at all, an individual may doubt the efficacy of the behaviour and look for alternative representations of the problem. Walker (2001) suggested that time is an important element in the development of emotions. In particular, that initial confidence can give way to anxiety when it becomes apparent that the desired outcome is not being achieved. However, if over time desired outcomes are achieved, this may reinforce perceptions of control and cultivate a sense of self-efficacy or personal mastery. The results of a study of heart attack patients by Lowe, Norman and Bennett (2000) indicate that the way in which people cope at any time, may have different short and long term roles. They seem to use avoidant, social/emotion and acceptance-focused coping to address immediate issues, whereas problem-focused coping was used to address longer-term changes. Carver and Scheier (1993) examined the effects of coping with problems and which ways of coping are most effective in the short-term

and in the longer-term. They start from the assumption that behaviour is directed towards a goal. They then suggest that when people pursue a goal, their efforts at self-regulation form a feedback loop. In particular, that they monitor their actions, periodically assess whether the actions are producing the intended results, and make adjustments to their actions to remedy any discrepancy between the two values. Disruptions to the behaviour could be external impediments and internal doubts or conflicts. In addition, difficulty in moving towards a goal may also be experienced if the perception that the effort to move toward one goal is creating an undesired discrepancy with respect to another important goal. They note that the idea of confidence versus doubt has an important role to play in determining behaviour. Confidence is likely to result in continued effort whilst doubt is likely to end in disengagement (or giving up). However, Carver and Scheier (1993) believe that both continued effort and giving up are both adaptive aspects of behaviour when they occur in the right circumstances. Whilst continued effort is adaptive in any situation where it will produce the desired outcome, disengagement is the better option in situations where continued effort is futile. There may be circumstances where a person wants to give up but cannot. This may be because the goal is deeply connected to his/her implicit definition of self or if he/she has been diagnosed with a life-threatening illness. This implies that continuing life on its present course may not be possible and therefore giving up would mean giving up on themselves, would have very adverse consequences and therefore, be extremely difficult to do.

A number of researchers have put forwards a definition of coping (e.g. Carver & Scheier, 2002; Lazarus & Folkman, 1984; Leventhal, Suls & Leventhal, 1993; Taylor, S., 1999). Considering all of these definitions together, coping could be described as a multidimensional set of processes or procedures carried out to create/maintain a desired condition. It is action taken to manage adversity or stressors or problems and is action that is evaluated. Lazarus (1966) was one of the first researchers to study how people cope with stress and to differentiate between two main types of coping. Lazarus and Folkman (1984) called these two types of coping problem-focused (efforts designed to alter the relationship to the stressor) and emotion-focused coping (efforts designed to alter reactions to the stressor). However, the literature regarding the number and nature of coping strategies is not consistent. In their critical review of coping Parker and Endler (1992) suggested that

there are three basic dimensions to coping (emotion-focused, problem-focused and avoidance). This three-factor solution to coping was also confirmed in a study by Ingledeew *et al.* (1996). However, Carver, Scheier and Weintraub (1989) found a four factor solution that included problem-focused, social/emotion focused, avoidant-focused and acceptance-focused coping. Weidner and Collins (1993) suggest that avoidant strategies all focus on diverting attention away from either the source of stress or from reactions to stress (psychological and somatic). Such strategies include denial, distraction and repression. They suggest that avoidance is a more adaptive behaviour when the situation is uncontrollable. Suls and Fletcher (1985) have also suggested that these strategies can be adaptive when individuals are facing non-physical threats that are short lived and of no long-term consequence. Avoidance may also be used when threat appraisal (i.e. perceived vulnerability to disease and belief that the disease would have severe consequences) is high, but coping appraisal (self-efficacy, perceived costs of protective response and rewards of not acting) is low. Threat appraisal and coping appraisal are part of protection motivation theory (Maddox & Rogers, 1993; Rogers, 1975; 1983). This theory is a model of health behaviour that focuses on motivation to take self-protective action. It proposes that an individual will adopt protective behaviour if they believe it will be effective in reducing threat, is low in cost and is something they feel capable of doing (Rogers, 1983). O'Brien Cousins (2003) found that motivation to initiate physical activity was apparently triggered by a health threat. However, she found that whilst a health threat can act as a wake up call to become more active, inactive participants were not convinced they needed to become active and some active participants only became convinced when a major health problem arose. In contrast to avoidance coping Taylor, S. (1999) notes that use of problem focused (confrontation/vigilant) coping involves gathering information and taking action. However, whilst people who use this style may engage in the cognitive and emotional effort required to deal with long-term threats, they could also suffer short-term anxiety as a consequence. The literature on illness representations and coping is discussed in more detail in the beliefs about health and physical activity domain (Chapter 8). Literature on coping has been included in the current chapter because it helps to understand why some individuals maintain physical activity and others do not. Coping processes can also influence how CHD risk factors are managed and physical activity can be used as a coping response to a perceived health threat.

2.19 Health Locus of Control (HLC)

One construct that has been widely used in order to investigate the determinants of health behaviour is health locus of control (Wallston *et al.*, 1976). In their review of HLC Norman and Bennett (1996) found that the main way in which HLC has been used in health psychology is as a predictor of preventive health behaviour. However, it has also been used to explain experiences of helplessness and acceptance of help (e.g. Lefcourt, 1981; Wallston, 1997). This literature is discussed in Chapter 7. The HLC construct originated from Rotter's (1954) social learning theory, which states that the likelihood of a behaviour occurring is a function of an individual's expectancy that the behaviour will lead to a particular outcome in that situation and the extent to which the reinforcement (or outcome) is valued. The original locus of control concept was measured on a uni-dimensional scale and suggested that people differ along an internal – external dimension (Rotter, 1966). At the high end of the internal scale, people believe that they are responsible for their own destiny and can control it by their behaviour. At the other end of the scale, people believe their lives are controlled by external events beyond their control, such as the behaviour of others or fate. Wallston sees health locus of control (HLC) beliefs as a disposition to act in a certain way in health related situations, rather than a personality trait (Wallston, 1992). He also believes HLC beliefs can be modified by health experiences (Wallston, 1997). However, in contrast, Lau (1982) believes HLC beliefs are relatively stable and suggests that they are not affected by recent personal experience of illness. Despite this view, he does acknowledge that “the attributions people make after getting sick are crucial in determining what effects that illness episode will have on related health beliefs and health behaviours” (p. 333).

Since its conception in 1976 the original uni-dimensional HLC scale has been expanded and developed into a multidimensional scale. The external locus of control scale has been divided into two concepts namely, powerful others locus of control (PHLC) and chance locus of control (CHLC) (Levenson, 1974). Distinct dimensions of internal HLC (IHLC) have also been identified, such as self-mastery, illness prevention, illness management and self-blame (Marshall, 1991). Whilst the division of the internal HLC dimension has not been adopted in subsequent studies, the division of the external scale has been incorporated into the multidimensional HLC scale (Wallston, Wallston & DeVellis, 1978). Three versions of the

multidimensional HLC (MHLC) scale have been developed, called forms A, B and C. Forms A and B were devised to deal with general health status and consist of eighteen questions (six items for each of the three dimensions). Wallston *et al.* (1978) suggest forms A and B are equivalent and both result in equal reliability and validity, although this has recently been questioned (Hubley & Wagner, 2004). Form C was developed for disease specific conditions (Wallston, Stein & Smith, 1994) and consists of twenty-four questions (eight for each of the three dimensions). It was intended for use with individuals with chronic illness or medical conditions and was validated for people with pain, rheumatoid arthritis, diabetes and cancer. In 1999, a fourth dimension, relating to the belief that God controls health status was added to form C of the MHLC scale (Wallston *et al.*, 1999). This dimension was found to be useful when attempting to explain health behaviour in people with acute or chronic conditions, such as rheumatoid arthritis (Wallston *et al.*, 1999). The God dimension has also been found to be a factor believed to control health in Canadian women (Chaplin *et al.*, 2001). However, it is important to remember that generalities about MHLC should be viewed with caution, particularly of the scale developed in one population and used in another with different values, experiences and resources (e.g. Bell, Quandt, Arcury, McDonald & Vitolins, 2002). Indeed, in their review of HLC Norman and Bennett (1996) noted that specific HLC scales have been developed for both behaviours (e.g. smoking, weight, AIDS) and conditions (e.g. diabetes, arthritis, cancer, hypertension). Burk and Kimiecik (1994) tested the predictive utility of the MHLC scale (form A) compared with an exercise specific locus of control scale, called the FITLOC. The FITLOC measures beliefs about the causes of reinforcements of exercise behaviour (Whitehead & Corbin, 1988). Regression analysis was carried out on data from the sample of existing members of a University fitness programme (Burk & Kimiecik 1994). This showed that a significant amount of the variance in exercise behaviour was only accounted for by the powerful others dimension of the FITLOC, indicating that internal locus of control is not the only important dimension influencing participation in health behaviour. The authors suggest that their results provide only modest support that the powerful others dimension of the FITLOC scale may be a better predictor of physical activity behaviour than the general MHLC powerful others HLC dimension. These findings also suggest the importance of powerful others in influencing exercise behaviour. Lefcourt (1991) has suggested that overall, studies that have

used behaviour specific HLC scales, have tended to be more predictive of health behaviour than more general measures such as the MHLC.

The HLC construct has been used to explore behaviour in different population groups. However, a review of HLC and gender found that few studies have explored the relationship between gender and measures of locus of control, although women have generally been found to be more externally orientated than men (Sherman, 1997). Researchers have been more interested in using the HLC construct to investigate age and health behaviour (e.g. Bell *et al.*, 2002; Frazier, 2002; Marshall, 1991; Schieman & Campbell, 2001; Wallston & Smith, 1994). In their review of control and health in a life span context, Wallston and Smith (1994) found that in the middle-aged years control beliefs play an important role in helping to explain and predict behaviour, although they do not do so on their own. Strong beliefs in control over health did not necessarily lead to positive outcomes. This was particularly the case in those with chronic illness, where the level of severity of disease affected the extent to which beliefs were confronted. Indeed, healthy older adults have been found to report higher internal control beliefs than older adults with chronic illness (Frazier, 2002). Older adults have also been found to report lower health control, self-efficacy and self-esteem, with age being negatively associated with self-efficacy amongst the chronically ill (Schieman & Campbell, 2001). Marshall (1991) found that advancing age was associated with lower levels of self-mastery and that older adults perceived themselves to be less capable of overcoming obstacles to physical health, even though in principle they knew that their desired health outcomes were dependent upon their own actions. He suggested that lack of a relationship between age and internal HLC may be due to a decline in perceived control that accompanies physical infirmity being offset by a greater knowledge of personal resources and capabilities. However, self-mastery has been found to be associated with an improvement from a sedentary to an active lifestyle in the elderly (Burton *et al.*, 1999). Bell *et al.* (2002) noted that there is only a small body of knowledge relating to locus of control among older adults. Their study of older adults found that PHLC and CHLC scores were higher for individuals with more than two chronic conditions. CHLC scores were also higher for individuals with fair/poor self-rated health and were positively associated with age and number of chronic conditions. Lachman (1986) reviewed the research on personal control in adulthood and old age.

She found that the elderly acknowledge the importance of external sources of control, yet at the same time, preserve their sense of internal control. Studies that have considered whether locus of control changes as people grow older have produced mixed evidence. This is possibly due to differences in the composition of samples, study designs and measurement instruments. However, Lachman (1986) found that it appears that the external dimensions of perceived control are more consistently age related than the internal dimensions. Nurmi, Pulliainen and Salmela-Aro (1992) also explored control beliefs and age differences. They noted that findings concerning age-related changes in locus of control have been remarkably inconsistent. However, their study found that subject's interest in their own health increased with age. In addition, thinking about health became more external with age. They suggest that these age differences in control beliefs may reflect life-span related changes in people's opportunities to influence certain domains of life such as health, (i.e. as people age, health-related physiological changes become more evident and less controllable). They also suggest that older adults make more realistic appraisals than younger ones, therefore it is possible that as knowledge and experience increase with age, internality decreases. Bell *et al.* (2002) suggest that those providing health care to older adults should be aware of the barriers that individuals with external health orientation face in initiating self-care behaviour. In particular their need for a structured regimen in order for these behaviours to occur. Conversely, an understanding of those with internal beliefs will enable the health care provider to offer a number of options to individuals in order that they are able to initiate behaviour.

2.20 HLC and Health value

A review of the early research on HLC found that people with high internal HLC, who also valued their health highly, were more likely to engage in health promoting behaviour (Wallston & Wallston, 1982). This supports social learning theory, which suggests that behaviour is a function of expectancy beliefs and the value attached to certain goals (Rotter, 1966). A strong theoretical case for examining HLC beliefs along with health value has been made (Wallston, 1991). However, Wallston (1991) suggests that studies may have neglected health value since they failed to fully appreciate social learning theory or because they assumed that all people value their health. In their review of HLC, Norman and Bennett suggested that the omission of

health value might account for the mixed results produced by much of the early research on the relationship between health locus of control and health behaviour (Norman & Bennett, 1996). The most popular measure of health value is a scale developed by Lau, Hartman & Ware (1986). This consists of 4 questions measured on a 6 point Likert scale. Its benefits are that it is short and reports satisfactory levels of internal consistency (.63 to .72) across different populations (Lau *et al.*, 1986). However, the scale has been criticised for focusing on long term 'global health' (Bennett, Moore, Smith, Murphy & Smith, 1994). In doing this, it is suggested that it might fail to capture the relationship between locus of control, the value placed on short-term health gains, and behaviour. In addition, the scale does not measure health value in relation to other factors.

Studies that have examined HLC and health value have generally found that health value has a moderating effect on the HLC dimensions (e.g. Norman, Bennett, Smith & Murphy, 1998; Steptoe & Wardle, 2001; Weiss & Larsen, 1990). Internal HLC has been found to be a significant predictor of health behaviour in students who place a high value on their health, but not for students who place a low value on their health (Weiss & Larsen, 1990). Valuation of health has also been found to amplify the impact of IHLC beliefs, but not change the nature of associations with health behaviour (Steptoe & Wardle, 2001). Adults under 65, with higher internal HLC beliefs and health value scores, have also been found to consume greater amounts of healthier foods, whilst those with low value for health and high chance HLC scores consumed higher amounts of less healthy foods (Bennett *et al.*, 1994). In a study with the same adult population, evidence suggested that health value moderated the relationship between HLC and an index of four health behaviours (Norman *et al.*, 1998). This study found that health value moderated the effects of powerful others and chance HLC beliefs, although it did not moderate the effects of internal HLC beliefs. In addition, the three HLC dimensions, along with health value, only explained a very small percentage of the variance in health behaviours (3%). Another study also found that HLC predicted less than 1% of the variance in exercise behaviour (Norman, Bennett, Smith & Murphy, 1997). This found a weak but significant positive correlation between the internal HLC dimension and exercise frequency and a significant negative correlation between the powerful others and the chance HLC dimensions. However, the study found no evidence to suggest that

health value moderated the relationship between the HLC dimensions and exercise behaviour. Interestingly, the addition of age and gender in to the regression resulted in a significant increase in the amount of variance that was explained, which Norman *et al.* (1997) suggested is indicative of the fact that the HLC variable dimensions were unable to fully mediate the influence of these variables. Indeed, MHLC has been found to be a weak predictor of health behaviour, even when considered in conjunction with health value (Norman & Bennett, 1996; Wallston, 1992).

A number of studies that have examined HLC, health value and health behaviour have used data from the Heartbeat Wales survey (e.g. Bennett *et al.*, 1994; Norman *et al.*, 1997; 1998). Heartbeat Wales was a five year coronary heart disease reduction programme launched in Wales in 1985 (see Nutbeam, Smith, Murphy & Catford, 1993). Data on the project was gathered via three population surveys (1985; 1988 & 1990). These were undertaken with a large representative sample of Welsh adults aged under 65. The surveys collected data on a number of health behaviours and included a measure of health locus of control and health value. In the 1985 survey, participants completed form A of Wallston's multidimensional health locus of control (MHLC) scale (Wallston *et al.*, 1978) and Lau's measure of health value (Lau *et al.*, 1986). The 1990 survey used a shortened version of the MHLC questionnaire, with nine questions (three items from each of the three subscales). These items had internal reliability coefficients that compared favourably with the findings from previous analyses of the full MHLC scale (Wallston, 1989). Norman *et al.* (1998) used the data from the shortened version of Wallston's MHLC scale, along with Lau's health value scale, to examine the relationship between HLC and a number of health behaviours, including exercise. They constructed a health behaviour index from four health behaviours (not smoking, drinking alcohol within the recommended limits, meeting physical activity recommendations of twenty minutes strenuous exercise three times per week and eating fruit and vegetables six or seven days per week). The findings showed that scores on this index were positively associated with internal HLC scores and negatively associated with scores on the powerful others and chance dimensions. Individuals believing health to be under their own control were more likely to perform a greater number of health behaviours, whilst those believing health to be due to chance or powerful others were less likely to perform them. Responses to the shortened version of the MHLC were

classified according to Wallston's eight HLC types, based on the median splits on the three HLC dimensions (Wallston & Wallston, 1981). Literature on this is discussed in Chapter 5. Norman *et al.* (1998) found that individuals with a pure internal locus of control performed the most health behaviours, whilst those with strong chance HLC beliefs were less likely to perform health behaviours. In addition, those types including low chance beliefs engaged in more health promoting behaviours than those with high chance beliefs. They concluded that there is potential for using Wallston's typology in order to analyse HLC data (Norman *et al.*, 1998).

2.21 Wallston's Modified Social Learning Theory (MSLT)

In 1992, Wallston published a critical review of the construct of health locus of control (HLC) entitled *Hocus-pocus, the focus isn't strictly on locus: Rotter's social learning theory modified for health*. He emphasised that health locus of control "constitutes a relatively small proportion of the larger and more important construct, perceived control over health" (Wallston, 1992, p. 186). He believed that when predicting health directed behaviour, the construct is not as significant as health value or perceived control (Wallston, 1992). In an earlier review on perceived control and health, he noted that perception of control is a factor that has been associated with whether individuals engage in health behaviour (Wallston, Wallston, Smith & Dobbins, 1987). In this paper, Wallston and colleagues explored the dimensions, antecedents and consequences of perceived control. They noted that a variety of labels and definitions have been used to discuss issues of control and that "perceived control may be used in a generic sense or go under the construct labels of locus of control or self-efficacy" (p. 5). However, in their 1987 review, Wallston and colleagues utilised a broader definition of perceived control as being "the belief that one can determine one's own internal states and behaviour, influence one's own environment, and/or bring about desired outcomes" (Wallston *et al.*, 1987, p. 5). Wallston *et al.*'s review distinguished between two major dimensions of perceived control. The first is control over time (i.e. is the focus on control over past, present or future events) this literature is discussed in Chapter 9. The second is control over what (i.e. behaviour, outcome or process). They point out that locus of control and self-efficacy are separate constructs that address different aspects of perceived control. Whereas locus of control refers to control over outcomes, self-efficacy is

concerned with control of behaviour. Therefore, individuals with an IHLC orientation do not necessarily believe they can undertake the behaviour required to achieve valued outcomes. However, locus of control and self-efficacy have been found to work together to determine health consequences (Wallston, 1997). In chronically ill adults for example, only self-efficacy scores of those with an internal orientation were found to predict outcome behaviour, whereas for those with an external orientation, there was no relationship between efficacy beliefs and outcomes. The literature on control over outcomes is discussed in Chapter 7.

Since Wallston's work on perceived control, a number of recent studies have explored perceived control and exercise behaviour (e.g. Armitage, 2003; Norman, Conner & Bell, 2000). This literature is discussed in Chapter 5. Low perceived control has also been identified as one of the behaviours that make people prone to coronary disease (see review by Powell, 1992). Powell suggests that there are differences between the beliefs underlying low perceived control and those of locus of control. Whereas low perceived control is associated with external attributions for negative events, combined with active coping, locus of control would propose that beliefs about the cause of events are linked to coping styles (for example, active coping is linked to internal attributions, whilst passive coping is linked to external attributions). Findings from the review suggest that low perceived control is driven by the basic beliefs and attitudes that people hold about themselves and the world. One key belief that drives low perceived control is that the environment shapes, orchestrates and controls behaviour (i.e. environmental determinism). The other key belief is that the environment is always malleable and can be changed through personal effort. Low perceived control therefore emerges from persistent attempts to control the uncontrollable. In contrast to this, high perceived control results from knowing when and how to switch from trying to bring the environment in line with what an individual wants and bringing themselves in line with the environment. High perceived control is characterised by the beliefs that the environment might be malleable through personal effort and that behaviour is a function of both individual (behaviour, cognition, emotions and physiology) and environmental influences acting together (i.e. reciprocal determinism).

Wallston concluded his 1992 critical review of HLC by emphasising that an internal HLC orientation is a necessary, but not significant condition for engaging in healthy behaviour. He then put forward a modified social learning theory (MSLT) that substituted locus of control with perceived control. Perceived control includes control over outcomes (e.g. HLC) and control over behaviour (self-efficacy). Wallston's MSLT provided a bridge between the social learning theory of Rotter, (1954) and that of Bandura, (1977a). Rotter (1954) introduced the idea of learning from generalised expectancies of reinforcement (outcome) and internal-external locus of control. Bandura (1977a) introduced the concepts of reciprocal determinism (belief that behaviour results from the reciprocal interaction between the environment, personal factors and behaviour) and self-efficacy. Wallston's (1992) conceptualisation of perceived control was however, more of a general and global one than the concept of self-efficacy originally envisaged by Bandura, (1977b). Wallston (1992) said that this more general version of self-efficacy might be referred to as 'mastery' or 'competence' which is the belief in capability to do whatever the situation requires in order to obtain the valued reinforcements or outcomes. In Wallston's modified version of Rotter's theory, locus of control is viewed as a moderator of health behaviour. However, in their review of perceived control and health (Wallston *et al.*, 1987) say that an individual is unlikely to engage in a health behaviour if they do not believe their health status is controlled by their own behaviour. This would be the case, even if they are motivated by health and are capable of engaging in the health behaviour. Wallston's MSLT therefore states that "people must value health as an outcome, believe that their health actions influence their health status, and concurrently believe that they are capable of carrying out the necessary behaviours in order to have a high likelihood of engaging in health directed action" (Wallston, 1992, p. 195). In his 1992 paper Wallston also made two observations. Firstly that, in line with social learning theory, an individual's expectancies are the product of past experiences. He suggested that these past experiences would include an appraisal of health status and therefore it is possible that IHLC beliefs are partly determined by health status rather than health status being the determinant of IHLC beliefs. His second observation was that the value of outcomes other than health will have an effect on behaviour. Therefore, behaviour depends on the expected outcomes of multiple potential behaviours (Wallston, 1992).

Wallston (1992) suggested that the theoretical framework of MSLT is applicable to both health promoting and illness/sick role behaviours. He suggested that when studying ill populations, the mediating relationship between self-efficacy and health-related behaviours may only hold true for individuals with IHLC beliefs, and for those who have external HLC beliefs, there will be no mediating relationship. Therefore, he believed that this pattern of findings would support the idea that HLC beliefs have a moderating role on health-related behaviours, such as physical activity. If an individual's health status is compromised by their medical condition, Wallston suggested that they would value being healthy. Therefore, it would be mainly perceptions of control that would predict adherence. These perceptions of control could be both internal and external and compliance in people with chronic conditions may be achieved via a partnership between the individual and their health care provider. Wallston also believed that health value or control expectancies are useful predictors of how quickly individuals seek medical attention. He suggested that the more an individual values health, the more likely they are to do something when it is threatened. Likewise, the more an individual expects their health behaviour to lead to favourable outcomes, the less reason to delay seeking information. However, a person with an internal orientation may blame themselves for the health problem and this may lead them to avoid and, or to delay confronting the problem. Indeed, Marshall (1991) has shown that self-blame is one of the factors that contributes to an internal orientation. Wallston (1992) also suggested it is possible that an over inflated sense of self-mastery could lead to delay in seeking medical attention, for example, if an internally orientated individual believes they can handle the problem without help. He believed that his modified social learning theory may also be useful in understanding how individuals adjust to chronic illness. In particular, that those who perceive they have control over their disease, its symptoms or treatment will have a more positive emotional response. Whereas, in contrast, those who believe they have low control over their health may lower their health value in order to reduce dissonance and feelings of distress. When there is little they can do about their health, they conclude that it is not important to be in good health.

2.22 Summary

This Chapter aimed to review the literature relevant to the study of physical activity and coronary heart disease (CHD). The review started with a discussion of CHD and how physical activity can reduce the risk of CHD. It did this in order to set the context for the results chapters. The public health recommendations for physical activity (see 2.4) are relevant to both Chapter 3 (in terms of the activity levels of the general adult population in Wirral) and Chapter 4 (in terms of the level of activity taken by those who participated in the ELC programme). Being physically active for less than thirty minutes each week, defined as sedentary behaviour, is one factor that contributes towards CHD. It is influenced by how individuals chose to spend their time and the importance that they attribute to both immediate and future costs and benefits associated with activity. This has particular relevance to the qualitative chapter on time (Chapter 9). Sedentary behaviour has contributed to the rising levels of obesity in Britain. One of the benefits of physical activity is that it has been found to attenuate many of the health risks associated with overweight or obesity. The levels of obesity in the ELC participants and the relationship between obesity and other factors, including physical activity, are explored in Chapter 4.

Different approaches have been designed to increase levels of physical activity. One of these is a primary care exercise referral scheme. The results sections in Chapters 4 to 9 each focus on findings that relate to individuals who had been referred to an exercise referral scheme (called the ELC). The GP has a key role in referring individuals into an exercise referral scheme (as discussed in section 2.8). The interaction between individuals who are referred to the ELC and their GP is explored in Chapter 7. A number of factors have been consistently found to influence physical activity behaviour (age and gender; barriers to physical activity; stages of change; expected benefits/outcome expectations; self-efficacy; self-motivation and health perceptions). In addition, illness representations and coping are particularly important constructs in helping to understand physical activity behaviour in the context of this thesis. These factors are explored in the qualitative study (presented in Part 3). Health locus of control and Wallston's modified social learning theory are a key part of this thesis. Chapters 5 and 7 focus on exploring the usefulness of these theories in helping to understand physical activity behaviour in the context of a primary care exercise referral scheme.

Part Two

Quantitative Studies

Chapter 3

Wirral Health and Lifestyle Survey

3.1 Introduction

Findings from the Wirral coronary heart disease (CHD) equity audit (Nzuobontane, 2001), showed that death rates from CHD in Wirral have fallen by almost fifty percent over the last ten years and are similar to those of England as a whole. However, this improvement has not been uniform across the peninsular and considerable geographical variation in CHD mortality exists in Wirral. Wirral consists of three primary care groups (or two primary care trusts after 2003) and twenty eight wards. The CHD standardised mortality ratio (SMR) for Wirral is 100 (the same as for England). However, this differs across Wirral's three primary care areas. The SMR is 83 for Bebington and West Wirral, 105 for Wallasey and 115 for Birkenhead. This means that there are 15% more deaths from CHD in the Birkenhead area than the England average. This disparity is more pronounced when viewed at Ward level across Wirral. For example, the SMR for Tranmere is 125, that is, there are 25% more deaths from CHD in Tranmere than the England average. In comparison to this, the SMR for Heswall is 75, which means that there are 25% fewer deaths from CHD in Heswall than the England average.

Physical activity is an important factor in the primary and secondary prevention of disease (BHF, 2000). It has also been recognised as a significant influence on reducing obesity (National Audit Office, 2001). In addition, it is well recognised that lifestyle habits, such as inactivity can increase the risk of coronary heart disease (e.g. Blair, 1994). In 1992, 52% of the adults in Wirral were reported to be sedentary (Dawson, 1992), that is they were never active or were active less than once a week (DoH, 1998). It has been estimated that if individuals who are sedentary or inactive, increase their activity levels to moderate, their risk of coronary heart disease will be reduced by 9% (Britton & McPherson, 2000). Frequent physical activity has also been found to be one of the significant contributing factors to perceived good health (Seitsamo & Klockars, 1997). The most recent recommendation for physical activity is thirty minutes or more of moderately intense aerobic activity, such as brisk walking or cycling on five or more days per week (DoH, 1996; Pate *et al.*, 1995). This recommendation is based on mounting evidence

that indicates that the health benefits of physical activity are linked principally to the total amount of physical activity that is performed (e.g. Haskell, 1994; Lee *et al.*, 2000; Pate *et al.*, 1995). In their review of the correlates of adult participation in physical activity, Trost *et al.* (2002) found that age and gender were the most consistent demographic correlates. Men are consistently more active than women and activity decreases with increasing age. In addition, high socio-economic and occupational status were consistent determinants of physical activity behaviour, whilst being overweight or obese emerged as a negative influence on physical activity. Perceived good health or self-assessed rating of health was also found to be positively associated with physical activity (Trost *et al.*, 2002). In addition, this has been found to provide an important indicator of the general health of the population (Idler & Benyamini, 1997). Therefore this measure is useful for generating information on the projected use of health services and hence, for planning and developing health policies.

The Government white paper, *Saving Lives: Our Healthier Nation* (DoH, 1999) set a target to reduce the death rate from CHD and emphasised the importance of assessing what needed to be done locally in order to reduce health inequalities. In response to this need, a Health and Lifestyle survey was carried out in Wirral during 2001. The survey formed the starting point for this research. The aim was to provide a baseline position for the health and lifestyle habits of the adult population of Wirral and to inform what needed to be done locally in order to reduce health inequalities. The survey included questions on a number of lifestyle habits and therefore covered more ground than is within the scope of this research study. The findings were used to inform a number of public health interventions in Wirral. One of these was the Exercise and Lifestyle Centres programme, which was a primary care exercise referral programme for adults at risk of CHD. This programme ran from January 2001 until July 2003 and forms part of the current research (see Chapter 4).

The focus of the current study is physical activity. Therefore, this chapter looks at the findings that are specifically relevant to meeting the recommended levels of physical activity. The chapter concentrates on the current health and physical activity behaviour of Wirral adults. It aims to identify which variables are significantly associated with one another and which are significantly associated with physical

activity behaviour (i.e. meeting or not meeting the recommendations). It then builds a model to show the combination of variables that provide the best prediction of physical activity behaviour and how these variables interact with one another in order to impact on physical activity behaviour.

3.2 Method

3.2.1 Survey design

A steering group was set up at the outset of the survey to decide on its scope and content. This consisted of representatives from Metropolitan Borough of Wirral Council, Wirral Primary Care Groups and Wirral NHS trust. The group was chaired and co-ordinated by the researcher (Helen Beers) who was responsible for managing and delivering the survey. The group decided to collect data using a postal survey. This would enable a relatively large sample to be achieved within tight time and financial constraints. However, it was acknowledged that this approach would result in certain groups in the population being slightly under or over represented.

The main aim of the survey was to gain a picture of the current health and lifestyles of Wirral adults aged sixteen or over. One of the objectives was to provide information to make a comparison with the 1992 survey. Another objective was to obtain data that could be collated with that from other Merseyside surveys in order to gain a wider picture of health and lifestyles in the region. The majority of the questions used in the 2001 survey were, therefore, identical to those used in the 1992 Cheshire and Wirral survey (Dawson, 1992). Additional validated questions from the Health Survey for England (Erens & Primatesta, 1999) were also included in the questionnaire, along with some new questions, of particular interest to Wirral Health Authority, such as prevalence of osteoporosis and data on carers. The final questionnaire (Appendix 1) consisted of forty three questions divided into eight sections. These sections were on health in general, mental health, diet and nutrition, exercise, alcohol, smoking, demographic details, and carers.

For the purpose of this research study, three of the eight sections were explored (see data analysis 3.2.4). These were health in general, exercise and demographic details. Twelve questions were included, seven concerned health in general, two concerned exercise and three were demographic. The questions in the health in general section were:

- How is your health in general?
- Do you have any long-term illness, health problems or disability which limits your daily activities or the work you can do?
- In the last 12 months have you ever suffered from arthritis?
- Has a doctor ever told you that you have had a heart attack?
- Has a doctor ever told you that you have had a stroke?
- How tall are you?
- What is your usual weight?

These were designed to determine the prognosis for long term health in Wirral, and to provide an estimate of the prevalence of CHD. There were two questions in the exercise section, designed to enable an estimate of the prevalence of inactivity to be made, namely:-

- How often do you take moderate exercise – e.g. going for a walk, walking the dog, bowling etc?
- How often do you take vigorous exercise – i.e. things that last more than twenty minutes and make you breathless e.g. jogging, football, aerobics, and digging the garden etc?

The demographic section asked about gender, age, and current employment status. In addition, data on the geographical area from which responses were received were recorded.

A small pilot of the full questionnaire was undertaken with 25 people selected randomly from visitors to local leisure centres. Individuals were approached by the researcher and asked to complete the questionnaire and to provide feedback on its length, content and wording. Minor amendments were made to the questionnaire following completion of the pilot phase and a final version was produced. This was then set up in formic software by staff within Wirral NHS trust in order to enable the subsequent electronic scanning of the questionnaires directly into a database.

3.2.2 The sample

In order to select the sample size for the survey, the same formula adopted in the 1992 survey was used. This was $n = \frac{[0.5 \alpha]^2}{\Delta}$ where $\alpha = 1.96$ and $\Delta = 5\%$.

Δ

This formula produced a figure of 384 as the minimum number of respondents required to adequately represent each group in the wider population. Again in line with the 1992 survey, groups were selected based on primary care area and gender (that is three primary care areas and two gender groups, which equated to six groups). A response rate of 60% was assumed which meant that a minimum sample of 3840 was required (i.e. six groups x 384 x 100/60). The steering group decided to sample 4000 adults. A response rate of 45% was obtained (1841 people).

The information systems department at Wirral Health Authority selected the sample using the random number generator within Microsoft Excel software. The health authority register of patients was used as the sampling frame. The sample was stratified by ward, gender and in to three age groups (16-34, 35-64 and 65+). A sample of 4,000 was drawn according to NHS number on the register. This was obtained systematically from a random starting point and provided a representative proportion of individuals in each primary care area and by age group and gender within each.

3.2.3 Survey administration

The NHS number was used to identify names and addresses for mailing purposes and this information was maintained on a separate database. Each individual was given a unique identification number to facilitate mailing and monitoring return of the questionnaires. Once responses were received, the data was coded according to the unique identification number and a separate database was produced with responses that could not be attributed to specific individuals.

Approval for the survey was gained from Wirral Medical Research Ethics committee in May 2001. In order to increase awareness of the survey and to encourage those receiving a questionnaire to complete it, a press release was made in the local paper and posters were displayed in GP surgeries.

The questionnaires were prepared in advance and sent out in one batch, to named individuals, in June 2001. They were accompanied by a covering letter (Appendix 2) and a reply paid envelope. The covering letter explained the reason for the survey, set out how the respondent was selected and gave assurances of confidentiality. A help line number was also provided for people to contact if they

wished to. Two postal reminders followed the initial mail out (one by postcard and one by despatch of a further copy of the questionnaire). Returned questionnaires were stored securely at the Trust premises.

3.2.4 Data analysis

Completed questionnaires were scanned in to a formic database using scanning and computer equipment based at Wirral NHS Trust. The final database was exported into SPSS software for analysis. For the purposes of the survey, Helen Beers analysed the data at descriptive level only and produced a report on behalf of the steering committee (Beers, 2002). For the purpose of this research study, twelve questions from the survey have been analysed in more depth (see survey design 3.2.1). The analysis included three statistical methodologies, a Chi square analysis, a logistic regression analysis and structural equation modelling. Each of these methods are described below.

Chi Squared analysis

A Chi-square test was performed on the data in order to determine whether any differences between variables were statistically significant. This test was selected since it enables frequency data (comparison of observed and expected frequencies) to be explored. It also allows the association or relationship between variables to be tested. The significant and interesting findings are reported in sections 3.3.1 to 3.3.8.

Data was selected for analysis based on the literature relating to physical activity and CHD. The analysis included those variables that were believed to be significantly associated with physical activity behaviour. The aim was to explore the association between health, demographic variables and physical activity behaviour.

Four aspects of health were investigated, namely

- 1) Self-assessed rating of health in general. A categorical variable with six options, excellent, very good, good, fair, bad, very bad (coded 1 for excellent to 6 for very bad).
- 2) Possession of a long-term illness, health problem or disability. A dichotomous variable, yes or no (coded 1 or 2).
- 3) Arthritis, heart attack and stroke. Each one was a dichotomous variable, yes or no (coded 1 or 2).

- 4) Body mass index or BMI (an indicator of a healthy height to weight ratio). A categorical variable with three BMI categories; normal weight, over weight, or obese (coded 1, 2 or 3).

The analysis also included six demographic variables that the literature indicates are important in predicting physical activity behaviour. These were

- 1) Age, a categorical variable with three options, under 35, 35 to 64 and over 65 (coded 1, 2 or 3).
- 2) Gender, a categorical variable with men coded 1 and women coded 2.
- 3) Employment status, a categorical variable with eight options. Working full time (coded 1), working part time (coded 2), unemployed and looking for a job (coded 3), never had a paid job (coded 4), unable to work due to illness or disability (coded 5), retired (coded 6), student (coded 7) and housework, not looking for paid employment (coded 8). There were only a few responses to code 4, so these were combined with responses to code 3 in chi square analysis. However, due to the limitations of the chi square test, employment was treated as a dichotomous variable in some cases (work was coded as 1 and not work was coded as 2).

Physical activity was analysed as a dichotomous variable based on meeting or not meeting the weekly recommended levels of physical activity (coded 1 for meeting recommended levels and 2 for not meeting recommended levels). In addition, response rates to the survey were investigated in order to explore if different groups in the population were more likely to supply information to inform health services (coded 1 for response, 2 for none response). Due to the limitations of the chi square test, age and BMI were both treated as categorical variables for this part of the analysis.

The data was analysed by taking each variable in turn and running the analyse, descriptive statistics, cross tabs and chi square statistic in SPSS against all of the other variables. This test was used to identify which variables were significantly different from the others variables (see Results Section 3.3.2).

Logistic regression analysis

Logistic regression analysis was carried out in order to determine which combinations of variables provided the best prediction of participation in physical

activity. This technique looks at the variables in relation to physical activity and does not explore their relationship to one another. It permits the prediction of a dichotomous dependent variable (in this case met or not met the recommended levels for physical activity) from a number of independent variables, which may be either continuous or categorical and it does not make assumptions about the distribution of the independent variables.

Seven variables were selected for inclusion in the model. These were the ones that were found to have statistically significant difference to physical activity behaviour in the univariate chi square analysis (see 3.3.2). Each variable was initially input individually as a covariate in to the binary logistic regression analysis facility within SPSS, with physical activity as the dependent variable (analyse, regression, binary logistic regression). This provided chi square values for each variable and information on the percentage of variance in physical activity behaviour which each one explained. The variables were then entered in to the logistic regression model in order of their chi square value, with the highest being entered first. As each variable was added in to the model, the percentage of variance predicted was compared to that of the previous model. If the addition of the variable improved the prediction, it was left in the model. If it reduced the prediction, it was removed from the model. This process was repeated for each of the statistically significant variables. The aim was to obtain the maximum percentage of variance in physical activity predicted by the least number of variables. In order to arrive at this, and in order to simplify the model, some variables were then removed from the model. This was based on the hypothesis that these variables were strongly correlated with, and therefore already accounted for, by other variables.

The variables were coded as in the chi square analysis. However, age and BMI were treated as continuous variables in this part of the analysis, since logistic regression analysis is able to deal with them in this format. Health in general and employment were treated as categorical variables (see coding in previous section).

Structural equation modelling

A structural equation modelling technique was used in order to take the logistic regression analysis a stage further. The aim of this was to explain the relationship or association between each of the variables in the logistic regression model and

therefore gain a better understanding of how the variables interact and impact on physical activity. In order to conclude that a model has provided the best explanation of the data, the comparative fit index and the Bentler-Bonnet normed fit index should each return a fit index of over 0.9. In addition, a non-significant chi square also indicates a good fit. (see Tabachnick & Fidell, 2000 for a discussion). Two post-hoc tests were used to identify redundant and missing pathways. The Lagrange multiplier test provides information on which parameters should be added to the model to improve the fit and therefore the explanation of the relationships between the variables. The Wald test provides information on which paths between variables are not significant and should therefore be omitted from the model.

The SPSS survey data file was input into a structural equation modelling software package, EQS (Multivariate Software Inc.). The first stage in constructing the model was to identify the variables of interest. This decision was based on a number of hypotheses about which factors significantly predict physical activity. The hypotheses were generated from the significant findings from the chi square analysis, namely that seven variables are predictors of physical activity. These seven variables were self-rated health in general, long term illness, arthritis, BMI, Age, gender and employment status. These variables were coded as per the chi square analysis, with the exception of employment status, which was coded work (0), not work (1), to allow for analysis in EQS. A decision to omit arthritis from the model was based on the theory that this measure is an objective one, which partly duplicates the long-term illness measure, and thus would not be independent.

3.3 Results

3.3.1 Introduction

The data from the survey has been analysed using three distinct methodologies (see methods section 3.2.4). The results are therefore divided in to three sections, firstly the univariate chi square analysis, secondly the logistic regression analysis and thirdly, results from the structural equation modelling.

Due to the large number of variables involved in the chi square analysis, the full results are shown in Appendix 3. A summary of the variables and the significant associations between them is show in section 3.3.2 (Table 3.1).

The logistic regression results table (3.3.9) starts with the seven variables from the chi square analysis. It shows the amount of variance in physical activity behaviour predicted by each variable on its own and then the prediction with combinations of variables. The final model, shown on the last line of the table, is the combination of the smallest number of variables that predict the largest percentage of variance in physical activity behaviour.

Results from the hypothesised and final structural equation models, (3.3.10) are shown in Table 3.4. The final model is also shown as a path diagram that depicts the significant relationships (Figure 1). The model highlights the direct and indirect relationships between the variables and physical activity behaviour.

3.3.2 Association between variables

The association between variables is shown in Table 3.1.

Table 3.1

Significant associations between variables (χ^2 at $p < 0.001$)

Variables	Physical Activity	Age	Gender	Employment	Work / not work	Long-term illness
Age	13.61				402.30	177.23
Survey responses		46.78	34.18			
Employment	46.01	-	179.07			454.00
Work / not work		402.30				
Meeting recommended levels of activity		13.61	8.67	46.01		26.69
Self-assessed rating of health in general	62.63	165.30			174.11	693.38
Long-term illness, health problem or disability	26.69	177.23		454.00		
Arthritis	17.76	287.79	29.96		124.55	
Heart attack		73.53	8.01		42.55	
Stroke		45.07			23.30	
Body Mass Index (BMI)	20.59	71.11	30.15	76.65		14.13
Gender	8.67			179.07		

p has been shown at ≤ 0.001 in order to take a conservative approach and minimise the chance that significant associations are incorrect (i.e. to avoid making a Type 2 error). The frequencies relating to Table 3.1 are shown in Appendix 3. Meeting the recommended levels of physical activity was found to be significantly associated with seven other variables (see 3.3.2) including age ($\chi^2=13.61$, $df = 2$, $p < 0.001$),

employment status ($\chi^2= 46.01$, $df = 6$, $p < 0.001$), self-assessed rating of health in general ($\chi^2= 62.63$, $df = 5$, $p < 0.001$), long-term illness, health problem or disability ($\chi^2= 26.69$, $df = 1$, $p < 0.001$), arthritis ($\chi^2= 17.76$, $df = 1$, $p < 0.001$), BMI ($\chi^2= 20.59$, $df = 2$, $p < 0.001$) and gender ($\chi^2= 8.67$, $df = 1$, $p < 0.001$). There was a statistically significant difference between age group and nine other variables (see 3.3.4). These were survey responses ($\chi^2= 46.78$, $df = 2$, $p < 0.001$), working or not working ($\chi^2=402.30$, $df=2$, $p < 0.001$), meeting the recommended levels of physical activity ($\chi^2=13.61$, $df=2$, $p < 0.001$), self-assessed rating of health in general ($\chi^2=165.30$, $df=10$, $p < 0.001$), long-term illness, health problem or disability ($\chi^2=177.23$, $df=2$, $p < 0.001$), arthritis ($\chi^2=287.79$, $df=2$, $p < 0.001$), heart attack ($\chi^2=73.53$, $df=2$, $p < 0.001$), stroke ($\chi^2=45.07$, $df=2$, $p < 0.001$) and BMI ($\chi^2=71.11$, $df=4$, $p < 0.001$). Gender was found to be significantly associated with six variables (see 3.3.5), survey responses ($\chi^2=34.18$, $df = 1$, $p < 0.001$), employment status ($\chi^2=179.07$, $df = 7$, $p < 0.001$), meeting the recommended levels of physical activity ($\chi^2=8.67$, $df=1$, $p < 0.001$), arthritis ($\chi^2= 29.96$, $df = 1$, $p < 0.001$), heart attack ($\chi^2=8.01$, $df = 1$, $p < 0.001$) and BMI ($\chi^2=30.15$, $df = 2$, $p < 0.001$). There were significant differences between employment status and four other variables, meeting the recommendations for physical activity ($\chi^2=46.01$, $df = 6$, $p < 0.001$), long-term illness, health problem or disability ($\chi^2=454.00$, $df = 6$, $p < 0.001$), BMI ($\chi^2=76.65$, $df = 12$, $p < 0.001$) and gender ($\chi^2=179.07$, $df = 7$, $p < 0.001$). In addition, working or not working was significantly associated with a further five variables (see 3.3.6). These were age ($\chi^2=402.30$, $df = 2$, $p < 0.001$), self-assessed health in general ($\chi^2=174.11$, $df = 5$, $p < 0.001$), arthritis ($\chi^2=124.55$, $df=1$, $p < 0.001$), heart attack ($\chi^2=42.55$, $df = 1$, $p < 0.001$) and stroke ($\chi^2=23.30$, $df=1$, $p < 0.001$). Having an illness, health problem or disability was found to be significantly associated with five variables (3.3.7). These were age ($\chi^2=177.23$, $df=2$, $p < 0.001$), employment status ($\chi^2=454.00$, $df = 6$, $p < 0.001$), meeting the recommendations for physical activity ($\chi^2=26.69$, $df = 1$, $p < 0.001$), self-assessed rating of health in general ($\chi^2=693.38$, $df = 1$, $p < 0.001$), and BMI ($\chi^2=14.13$, $df = 2$, $p < 0.001$).

3.3.3 Physical activity

There was a significant association between individuals self-rated assessment of health in general and whether they met the weekly recommendations for activity. Those who rated their health as excellent, very good or good were more likely to meet the recommended levels of activity each week, whereas those who did not meet the recommended levels of activity were likely to rate their health as fair, bad or very bad. There was also a significant relationship between illness, health problems or

disability and whether respondents met the weekly recommendations for activity. Those individuals who met the recommended levels of physical activity each week were less likely to report an illness, health problem or disability. Likewise, respondents without arthritis were significantly more likely to meet the recommended levels of physical activity. However, there was no significant association between meeting physical activity recommendations and either having had a heart attack or stroke. BMI category was significantly associated with whether individuals met recommended activity guidelines, with obese individuals being less likely to meet the recommended levels. The overall level of physical activity was found to decline significantly with an increase in age group (Table 3.2).

Table 3.2
Percentage of respondents meeting activity guidelines

	Gender		Age Group		
	Men	Women	16-34	35-64	65+
Activity Level	%	%	%	%	%
Moderate	50	44	52	44	47
Vigorous	17	7	20	10	6

The results also highlight that men are significantly more active than women (Table 3.2). Fifty three percent of men and 65% of women were found to lead a sedentary lifestyle (significant results).

3.3.4 Age group

Responses to the survey increased with age group, and older people were more likely to have responded than younger people. As would be expected, there was a significant difference between the three age groups with respect to whether they were working or not working, with those in the sixty five and over age group being significantly less likely to be in employment. Respondents in this age group were also significantly more likely to be sedentary, with 78% of them failing to meet the recommended levels of activity.

There was a significant difference between age groups and self-assessment of good health. Self-assessment of good health declined with an increase in age group with 44% of the over 65's rating their health as less than good. This is in comparison to the under 35's where only 14% believed their health to be less than good. In addition to age being associated with this measure of subjective health, it was also significantly associated with objective health. Respondents in the older age group

were significantly more likely to report having an illness, health problem or disability and to suffer from arthritis. Likewise, the prevalence of heart attack and stroke increased by age group. 11% of the over 65's had experienced a heart attack and 7% had experienced a stroke. The prevalence of obesity was also significantly associated with age group, with 16% of those in the thirty five to sixty four age group falling in to the obese BMI category.

3.3.5 Gender

Men were statistically less likely to respond to the survey than women. However, men were statistically more likely than women to be employed full time (section 3.3.6) and to meet the recommended levels of physical activity (section 3.3.3). There was a significant difference between the BMI categories of men and women. Men were more likely to be over weight than women (54% compared to 38% of women). However, women were more likely to be obese than men (13% compared to 11% of men). Taking the two categories together, 65% of men are in excess of a normal weight compared to 51% of women. Men were significantly more likely to have had a heart attack than women and women were significantly more likely to report having arthritis than men. Although men were likely to rate their health more highly than women, this study did not find the difference to be significant. In addition, there was no statistically significant difference in the objective measure of health and whether respondents reported having an illness, health problem or disability. Men reported slightly higher prevalence of illness, health problems or disability than women, although this difference was not significant (28% of men reported this compared to 26% of women).

3.3.6 Employment

Men were significantly more likely to be working full time than women and women were significantly more likely to be working part time than men. Those respondents who were working were more likely to rate their health as good or better than good. However, those who were not working were more likely to rate their health as fair, bad or very bad. In addition, those who were not working were more likely to report having a long-term illness, health problem or disability. Those individuals who were working were less likely to report having arthritis, heart attack or stroke. Employment status was found to be significantly associated with which weight category respondents were in. Individuals who were working part time, or were students were most likely to be a normal weight. However, those who were working full time, or were retired were most likely to be over weight. Individuals in the obese category were most likely to be unemployed and looking for work, or have an

illness, health problem or disability, or be engaged in housework. It should be noted that when employment status was categorised as working or not working, there was no significant association between this variable and BMI.

Employment status was also found to be significantly associated with whether respondents met the recommended levels of physical activity. However, when employment status was categorised as working or not working, the association was not significant. Respondents were more likely to meet the recommended levels of activity if they were working part time, or were unemployed and looking for work, or were a student, or said their status was that of housework, not looking for work. In contrast to this, they were less likely to meet the recommended levels of activity if they were working full time, or were unable to work due to illness, health problems or disability, or were retired.

3.3.7 Illness, health problems and disability

Respondents who reported having an illness, health problem or disability were significantly less likely to be working than those who did not report this measure of objective health (3.3.6). In addition, they were more likely to be in the oldest age group (3.3.4) and less likely to meet the weekly recommendations for physical activity (3.3.3). Those who reported having an illness, health problem or disability were significantly more likely to rate their health as less than good. The findings showed that obese individuals were significantly more likely to have a long-term illness, health problem or disability. Thirty six percent of those who were obese reported a long-term illness, compared with 25% of overweight and 24% of normal weight individuals.

3.3.8 Geographical area

The initial postal response to the survey varied significantly between the twenty-eight wards in Wirral, and therefore the three PCT areas ($\chi^2 = 59.47$, $df = 21$, $p = 0.001$). For example there was a low response rate from Bidston, Tranmere, Birkenhead and Leasowe wards. The first three of these wards have the highest levels of deprivation in Wirral and fall in to the Birkenhead PCT area . In contrast, there were high response rates from Clatterbridge, Royden and Bebington which are amongst the least deprived wards and fall in to the Bebington and West Wirral PCT

area. All of the other results relating to geographical area were not significant however, there were some notable variations in the findings. For example, the reporting of health problems was highest in Birkenhead when compared to the other two geographical areas. Respondents from Birkenhead were also more likely to have had a heart attack. There was also some variation in levels of over weight and obesity by geographical area. Men in Birkenhead had the highest prevalence of overweight and obesity, with 68% of them reporting a BMI of 25 or more. Obesity was highest in women from Birkenhead (15%) and Wallasey (15%). This was in comparison to Bebington and West Wirral where 10% of women were obese.

It is interesting to note that there was no significant difference in activity levels across the three geographical areas. Respondents living in the most deprived wards were as likely to undertake the recommended level of physical activity as those living in the least deprived areas.

3.3.9 Logistic regression

The univariate logistic regression analysis found seven variables were significant predictors of physical activity behaviour (Table 3.3). A combination of four of these variables predicted 62.1% of the variance in physical activity behaviour.

Table 3.3

Logistic regression model

Model	χ^2	df	<i>p</i>	% of variance predicted
1. Health in general (categorical)	63.57	5	0.001	60.1%
2. Employment status (categorical)	47.83	6	0.001	56.5%
3. Long term illness (dichotomous)	26.61	1	0.001	58.1%
4. Arthritis (dichotomous)	17.69	1	0.001	57.3%
5. BMI (continuous)	14.94	1	0.001	57.4%
6. Age (continuous)	12.49	1	0.001	55.4%
7. Gender (dichotomous)	8.69	1	0.003	55.1%
1 & 2	94.34	11	0.001	60.1%
1 & 2 & 3	94.52	12	0.001	60.3%
1 & 2 & 3 & 4	95.89	13	0.001	60.8%
1 & 2 & 3 & 4 & 5	99.67	14	0.001	61.2%
1 & 2 & 3 & 4 & 5 & 6	99.29	15	0.001	60.9%
1 & 2 & 3 & 4 & 5 & 7	109.68	15	0.001	61.9%
1 & 2 & 3 & 7	111.59	13	0.001	62.1%

The final model therefore included health in general, employment status, long term illness, and gender (variables 1,2,3 &7). Higher levels of activity were associated with individuals who rated their health in general as good or better than good, individuals with an employment status of working part time, unemployed, student or housework, individuals who did not report an illness, health problem or disability and those who were men. Self-rating of health in general was the best predictor of physical activity, with the highest chi squared value and was therefore entered in to the model first. The addition of all other variables, in sequence of their chi square value, with the exception of age, increased the amount of variance that was predicted. The model with six variables (all except age) correctly predicted 61.9% of the variance in physical activity behaviour. However, when arthritis and BMI were omitted from the model, this improved the percentage of variance that was predicted. The final model therefore excluded three variables, age, arthritis, BMI and gender.

3.3.10 Structural model

The hypothesised model (Model 1) was drawn as a structural path diagram in EQS. It showed each of the six variables as direct predictors of physical activity. The results of this model were examined. Model 1 was not found to be a good fit ($\chi^2 = 603.406, p < 0.001$, comparative fit index = 0.048, Bentler-Bonnet normed fit = 0.053). Paths recommended by the Lagrange test were added and paths recommended by the Wald test were removed, in order to improve the fit. Three further iterations of the model were carried out (Models 2, 3 & 4) until no further iterations were recommended by the Lagrange and Wald tests. At this point, theoretical consideration was given to each of the six variables in order to decide if any of them should be omitted from the model in order to improve its fit. BMI was removed on the basis that the logistic regression analysis found that it did not improve the prediction of physical activity. The long-term illness, health problem or disability variable was also removed on the basis that self-prediction of health in general, which was already included in the model, is a more powerful predictor that includes both objective measures (such as long term illness) along with subjective measures including psychological health. The model was then run with age, gender, health in general and work as the independent (or exogenous variables) and physical activity as the dependent (or endogenous) variable. As with each iteration, the results from the model were examined and paths were added and removed in order to improve the fit and obtain the final model (Model 6, $\chi^2 = 5.269, p < 0.26$, comparative fit index = 0.998, Bentler-Bonnet normed fit = 0.992). The hypothesised and final models are shown in Table 3.4.

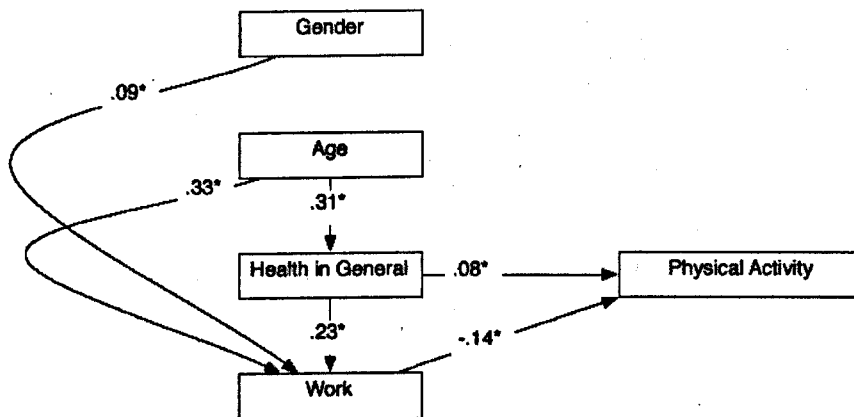
Table 3.4

Results from the structural equation model

	χ^2	df	<i>p</i>	CFI	Bentler-Bonnet
Hypothesised Model	603.406	6	0.001	0.048	0.053
Final Model	5.269	4	0.26	0.998	0.992
Difference	598.137	2	0.001		

The final model showed that four variables were significantly related, either directly or indirectly, to physical activity behaviour. The structural path diagram (Figure 1) shows the four variables and their relationship to one another and to physical activity.

Figure 1. Structural Path Diagram



The lines in the path diagram indicate statistically significant relationships between variables. A line with one arrow represents a hypothesised direct relationship between two variables, with the variable with the arrow pointing to it being the dependent variable. The path diagram therefore shows that both health in general and work, have a direct relationship to physical activity. In addition, gender and age both have an indirect relationship to physical activity. Age mediates the relationship between health in general and physical activity. It also mediates the relationship between health in general and work. Gender, age and health in general mediate the relationship between work and physical activity.

Those participants who have poorer health are significantly less likely to meet the recommended levels for physical activity. However, this relationship is mediated by age, which has an indirect relationship to physical activity. Age predicts health in general, with the older participants being more likely to report poorer subjective

health. Participants who are not working are more likely to meet the recommended levels for physical activity. Work is directly predicted by gender, with women being less likely to work than men. It is also directly predicted by age, with older participants being less likely to work. However, there is also an indirect relationship between age and work, with health in general being the mediating variable. That is, the older participants are more likely to report poorer health and those in poorer health are less likely to work.

3.3.11 Summary

The findings from the structural equation modelling identified self-rated health in general and employment status as having a direct relationship with physical activity behaviour. These two variables were also part of the logistic regression model that produced the best prediction of physical activity behaviour. From the chi square analysis, self-rated health in general was found to be significantly associated with physical activity behaviour. It was also significantly associated with age, employment status, and long-term illness, health problem or disability. Employment status was also found to be significantly associated with physical activity behaviour. In addition, this variable was significantly associated with gender, age, health in general, long-term illness, health problem or disability, BMI, arthritis, heart attack, and stroke.

The structural equation modelling identified that the effect of work on physical activity is mediated by gender, age and self-rated health in general. It also showed that the effect of self-rated health in general on physical activity is mediated by age. The chi square analysis found that the groups most likely to be in work were men, the under 65 age group, those without an illness, health problem or disability and those rating their health in general as good or better than good. In addition, individuals were more likely to rate their health in general as good or better than good if they were aged under 65, or did not have an illness, health problem or disability. The respondents who were most likely to meet the recommendations for physical activity were those in the younger age groups, rating their health in general as good or better than good, without a health problem, illness or disability and not in the obese category.

3.4 Discussion

3.4.1 Introduction

Age and gender have consistently been found to be correlated with physical activity (Trost *et al.*, 2002). The findings from the current study, therefore, support previous research. However, the structural equation model identified that age has an indirect effect on physical activity via its effect on two other variables, work and self-assessment of health in general. Likewise, gender also has an indirect effect on physical activity via its association with work. A number of studies have found self-assessed health status is related to physical activity behaviour (e.g. Kasmel *et al.*, 2004; Seitsamo & Klockars, 1997). Individuals who perceive themselves to be in good health and those who are in higher socio-economic groups or have a high occupational status, have also been found to be more likely to participate in physical activity (Trost *et al.*, 2002). The importance of occupational status and self-assessment of health as determinants of physical activity was also shown by the structural equation model in the current study. Indeed, these two variables were found to have a direct and significant association with physical activity behaviour. On the basis of this finding, this discussion is organised into two main sections, self-assessed health in general (3.4.2) and employment (3.4.3). It aims to explain the relationship or association between all four of the significant variables (age, gender, self-assessed rating of health and work) and physical activity behaviour. Within each of the two sections, both the direct and indirect associations will be discussed. In addition responses to the survey in terms of differences in gender and age will be discussed (3.4.4).

It is worth noting that activity levels were not found to differ significantly across Wirral. This was possibly due to demographic factors such as the age profile, level of education and affluence across the peninsular. For example, the Bebington and West Wirral area has the highest proportion of the older population and is the least deprived area. This means that activity levels are lower due to advancing age and owning transport. In contrast to this, the less affluent areas have a higher proportion of younger residents with low income. These individuals are more likely to engage in physical activity due to lack of transport. This is explored further in the interviews (see Part Three).

3.4.2 Self-assessed rating of health in general

Two explanations for the direct and significant effect of self-assessed rating of health on physical activity are suggested. The first is that those who meet the recommended levels of physical activity achieve health benefits as a result of this. They are therefore less likely to have an illness, health problem or disability and as a consequence are more likely to make a positive assessment of their health. Indeed, previous studies have demonstrated that all forms of mortality are lower in individuals who are active (e.g. Wanamethee *et al.*, 1998). Therefore, if individuals are physically active, they are less likely to suffer from illness, health problems or disability. The key point here is that the ability to be physically active is affected by illness, health problems or disability. Indeed, Lee (1999) found that people who have good health are more likely to make a favourable assessment of their physical activity. The current study also found evidence that those who reported having an illness, health problem or disability were significantly more likely to rate their health as less than good and therefore were less likely to meet the recommended levels for physical activity. The second explanation that is suggested to account for the direct effect of self-assessed rating of health on physical activity is that meeting the recommended levels of physical activity may contribute towards a belief that health is good or better than good. In fact, previous studies have found that when individuals make an assessment of their health, they take into consideration a wide range of factors, one of which is ability to be physically active (Benyamini *et al.*, 2003). In addition, it has been shown that frequent physical activity contributes towards perceptions of good health (Seitsamo & Klockars, 1997). If individuals are able to be physically active, do what they want to do and be energetic, they have also been found to be more likely to perceive themselves as healthy (Benyamini *et al.*, 2003).

One factor that has a significant effect on self-assessed health is age. The structural equation model showed that age had an indirect and significant effect on physical activity and that this association was mediated by self-assessed health. The importance of the relationship between age and self-assessed health is shown by the many studies that have focused on self-assessed health and older people (e.g. Lee, 1999; Mossey & Shapiro, 1982; Benyamini *et al.*, 2003; Benyamini, Idler, Leventhal & Leventhal, 2000). Findings from the current study showed that when respondents

rate their health they take account of their health status in terms of any health problem, illness or disability they have. The older age group was significantly more likely to report poor health status and therefore this explains their lower rating of health in general. Those in the oldest age group may also be significantly less active due to their higher levels of illness, health problems or disability, which may limit the activity they are able to undertake. Having an illness, health problem or disability was found to have a negative impact on self-assessed rating of health in general and this therefore provides an explanation for the indirect relationship between age, health in general and physical activity. In addition, older people who perceive their health as poor may not believe they have the capability to participate in physical activity (self-efficacy is discussed in Part Three). They may also be preoccupied with their current and perhaps more visible and functionally limiting health conditions. As a result, they may neglect to engage in preventive measures such as exercise and this may facilitate the progress of disease and eventually result in earlier death.

Attitudes towards physical activity may change as people age and older people may not take part in physical activity due to the way they think about their illness, or their illness representations (as proposed by Leventhal *et al.*, 1992; 1997). They may experience chronic illness and pain over a long period, which they attribute to conditions associated with their age. They may also believe that physical activity will not be effective in helping their health problem or may even cause them harm. Indeed, medical concerns and fear of injury have been found to be particularly important in shaping physical activity patterns in older adults (King, 2001). In addition, certain life events such as retirement for men may also lead to a reduction in physical activity. Evidence presented later in the current research (see Part Three) confirms that both pain and life events have an impact on levels of physical activity.

It was interesting that there was no significant difference between the three geographical areas in Wirral and how people within them perceived their health. This may be due to the fact that any calculation of self-rated health combines numerous factors from many different domains of life. This may encompass lived experience and knowledge of disease causes and consequences. Therefore the more affluent and well-educated areas may have greater knowledge of health and engage

in less risk behaviours. Self-rated health may also reflect the presence or absence of resources such as income, education, living arrangements or social networks, which can have an impact on decline in health. It may therefore be a reflection of the adequacy of these resources to meet future needs.

3.4.3 Employment

The structural equation model in the current study showed that the association between work, age and self-assessed health effects physical activity. It is suggested that a combination of poor health status and being in the older age group are variables that affect the respondents capability to be in employment. They may for example, not be in employment due to being over retirement age, or having a long-term illness that prevents them from working. The results suggest a complex relationship between whether respondents work or not and their physical activity behaviour. Looking at the larger picture, as depicted in the structural path diagram, those who work are less likely to meet the recommendations for physical activity. However, the chi square analysis (3.3.6) shows that when work is broken down in to full and part time, it is those working full time who are less likely to meet the recommendations, whereas those working part time are more likely to meet them. It is suggested that those working full time are less likely to have a lot of leisure time and will not choose to spend this engaged in physical activity. This finding supports research by Strum (2004) and Cawley (2004) which provided evidence that sedentary activities are increasing.

When the not working category is broken down in to its individual components (unemployed; student; housework; retired; and unable to work due to illness, health problem or disability) this facilitates the understanding of the associations between not working and physical activity. Two categories of 'not working' were found to be less likely than expected to meet physical activity recommendations, those who were retired and those with an illness, health problem or disability. One explanation for this may be that as people age and retire from work, they encounter a change in lifestyle. This is often associated with a decline in physical activity behaviour, particularly in the case of men who have held manual jobs. Retirement may also coincide with illness, health problems, or disability due to ageing (the association between age and health has been discussed earlier). However the other groups who

were not working (unemployed, student and housework) were more likely than expected to meet the recommended levels of physical activity. The unemployed may have been more likely to do this due to their age (in that they are below retirement age). It may also be due to lack of income and transport, which may mean that physical activity is a necessity resulting from lack of labour saving devices or a car. Likewise, age also has a mediating effect on student's physical activity behaviour. Students may be more likely to meet physical activity recommendations due to their youth, lack of income and transport. Indeed, the importance of occupational status as a determinant of physical activity has been confirmed by Trost *et al.* (2002). The final group likely to meet the recommended levels of physical activity is those engaged in housework. This group is most likely to be women, who Kandrack *et al.* (1991) point out tend to engage in more health protective behaviours than men. However, women are more likely to experience conflict between their social roles (e.g. Waldron, Weiss & Hughes, 1998) which has an impact on their time to participate in physical activity. They undertake more domestic activity than men and are responsible for childcare as well as being employed (ONS, 1998b). It is not surprising that the current study found that gender mediated the effect of work on physical activity. The results showed that women were less likely to work than men however, where they did work, this was more likely to be part time (this finding confirms existing research, e.g. Crompton, 1997). Those working part time were more likely to meet the recommendations for physical activity. It is suggested that part time working patterns might enable individuals to have more time to spend in activity, although for women, this may involve housework and caring responsibilities. In addition, working part time may mean that women are low paid (Crompton, 1997) and therefore engage in more activity than would be expected due to lack of transport and labour saving devices. Social inequalities between men and women may therefore explain the anomaly in the findings with respect to gender and levels of physical activity. That is, whilst two occupational groups, who were most likely to be women, were more likely than expected to meet physical activity recommendations, overall, women were less likely to meet the recommended levels of activity. The significantly lower activity level in women was reflected in their significantly greater levels of obesity. This shows a relationship between obesity and lower levels of energy expenditure as suggested by Hill and Melanson (1999) and indicates that inactivity contributes towards obesity.

3.4.4 Responses to the survey

Women may have been more likely than men to respond to the survey due to a number of factors. One explanation may be that there are differences in the way in which men and women view their health. Women have been reported to be more sensitive to illness (Hibbard & Pope, 1986), to engage in more health protective behaviours (Kandrack *et al.*, 1991) and to have greater utilisation of health care services (McCormick *et al.*, 1995). The response rates may therefore provide evidence that women take more interest in their health and are more likely to take part in health promotion initiatives such as a lifestyle survey and the exercise and lifestyle programme (see Chapter 4). Older people may have responded significantly better to the survey because they have more health problems and are therefore interested in providing information to inform health services. They may perceive a greater risk to their health and therefore be prompted to take actions to support health services. Another explanation for the large response from older people could be that they have more time to complete questionnaires and do not perceive time to be a barrier to participation.

3.4.5 Summary

This chapter has looked at physical activity in the general adult population in Wirral. It has shown that a number of variables interact in order to predict whether an individual will engage in sufficient physical activity to meet the levels recommended required to have a positive impact on health. However, as the logistic regression model highlighted, the variables explored in this chapter are only able to predict 62% of the variation in physical activity behaviour. The structural equation model has also shown that there is a complex relationship between age, gender, self-assessed rating of health, work and physical activity behaviour. Therefore in order to obtain a better understanding of physical activity behaviour, additional research has been carried out and this is presented in subsequent chapters.

The findings showed that inactivity is most prevalent in those reporting poor health, older individuals, those with a health problem, illness or disability and individuals with obesity. Thus, they provide information on groups who are at most risk from CHD. The findings in this chapter therefore provide evidence to support the need for an intervention to increase levels of activity in Wirral and this is the subject of the next chapter (Chapter 4).

Chapter 4

Exercise and Lifestyle Centres (ELC)

4.1 Introduction

The health benefits of exercise are well documented and there is a large body of evidence to suggest that regular physical activity can reduce morbidity (disease rates) and mortality (death rates) (e.g. Lee & Skerrett, 2001; Blair, 1994). The Government's white paper, *Saving Lives Our Healthier Nation* (DoH, 1999), set out targets to reduce morbidity and mortality by 2010. As part of the plan to achieve the targets for reduction of morbidity and mortality from coronary heart disease, it endorsed a primary care based exercise referral model (DoH, 1999). However, the effectiveness of a primary care based approach for increasing levels of physical activity has been questioned (Riddoch *et al.*, 1998). Indeed, Harrison McNair and Dugdill (2005) concluded that primary care based exercise referral schemes are unlikely to contribute to population levels of physical activity. In addition, GPs typically report spending little time counselling patients about exercise (e.g. Lawlor *et al.*, 1999). Whilst GPs have been found to be knowledgeable about the health benefits of physical activity (Lawlor *et al.*, 1999) they have also been found to lack confidence in their training and abilities to change exercise habits (Dishman & Buckworth, 1996).

The aim of exercise referral (or prescription) schemes is to promote physical activity to the individual, who is 'prescribed' or referred to a programme of exercise by a primary care professional (usually a GP). The exercise is generally delivered via a local leisure facility. Taylor, A. (1999) has suggested that leisure centre-based exercise programmes are influenced by three important factors (staffing, facilities and process). In terms of staffing, the disadvantages are a narrow focus on fitness, a low skills base, unhealthy clients, mixed safety skills and low credibility with GPs (GPs and health professionals are concerned about the safety of patients at leisure centres). However, the staffing advantages are exercise testing and prescription skills and motivational skills. There are also advantages and disadvantages associated with facilities (existing facilities and various options versus the disadvantages of off-peak availability and a sporty environment). In terms of the process of these programmes, they benefit from community links and inter agency

sharing, whilst suffering from limited liaison with primary health care and funding issues. In recent years, exercise on prescription schemes have been on the increase and over 200 of them were listed in a 1996 survey (Chapman, 1996). A review by Riddoch *et al.* (1998) highlighted that these schemes result in small improvements in physical activity patterns and other related measures. However, it is suggested that primary care based exercise referral programmes, often involving referral by a GP to a leisure facility, are not necessarily effective in increasing long term physical activity. For example, Webborn (1996) reported that only 20% of leisure centre referral patients continued to use the leisure centre on completion of the programme. In order to moderate coronary heart disease (CHD) risk factors, individuals need to adhere to physical activity schemes and continue their activity beyond the end of them (Taylor *et al.*, 1998). A recent study examined the factors associated with adult referrals and attendance on an exercise referral scheme in the UK. It found that women and those in the middle age group were most likely to be referred. However, those in the lowest and highest age groups were least likely to attend. In addition, referral reasons were found to differ by gender, with men being referred for cardiovascular disease risk factors and women for musculoskeletal conditions (Harrison *et al.*, 2005). UK studies have also questioned the ability of exercise referral schemes to have an impact on poor health at population level (e.g. Lawlor *et al.*, 1999; Harrison *et al.*, 2005).

A number of studies have been published on the barriers to participation in physical activity (e.g. Clarke & Eves, 1997; HEA, 1992; Steinhardt & Dishman, 1989; Sallis *et al.*, 1989; Sallis *et al.*, 1986). The most comprehensive categorisation of barriers was presented in the Allied Dunbar National Fitness Survey, (HEA, 1992). It suggested that barriers fall into five main categories or domains. The first is physical (e.g. injury, disability, over weight, poor health, too old). The second is emotional (e.g. not the sporty type, too shy/embarrassed, might get injured). The third is motivational (e.g. need to rest and relax, no energy, never maintain it, do not enjoy it). The fourth is time (do not have time due to work/children) and the final category is availability (e.g. no one to do it with, can not afford it, no suitable facilities nearby, not got the right clothes/equipment). Despite these barriers, there is some evidence that physical activity interventions can successfully increase rates of activity change. For example, a meta analysis examining interventions to improve

adoption of physical activity, found that success rates improved from 50% to 67% after some type of physical activity intervention (Dishman & Buckworth, 1996). However, early exercise adherence studies, carried out with participants at high risk of cardiovascular disease, suggest that a 50% drop out (or attrition) rate is common (Marcus *et al.*, 2000). For example, 50% of people who start an exercise programme drop out within the first 6 months (Dishman, 1982). This level of drop out may reflect the fact that many early studies focused on structured exercise programmes rather than a lifestyle approach to physical activity. Recent studies are more likely to report percentages of adherence to specific criteria and to specify if adherence includes home based exercise (Dunn *et al.*, 1999). However, regardless of the age of the studies, they all conclude that adherence decays over time.

The ELC was a primary care exercise referral scheme. Its aim was to reduce the risk of coronary heart disease (CHD) in Wirral adults. It attempted to achieve this by providing 12 weeks free access to lifestyle advice and leisure facilities throughout Wirral. This was delivered mainly in leisure centres across Wirral. In order to participate in the programme, an individual had to possess some factors which predisposed them to CHD, for example, inactivity, obesity, hypertension (high blood pressure), hyperlipidemia (high cholesterol), diabetes, smoking, age over 35, family history of heart disease and stress/anxiety/depression. The Exercise and Lifestyle Centres scheme complied with the criteria set out in the national quality assurance framework (NQAF) for exercise referral systems (DoH, 2001). For example, it had a formally agreed process for selection, screening and referral of patients, conducted appropriate assessment of patients, provided a range of appropriate and agreed physical activities delivered by professionals and incorporated a mechanism for evaluation.

This chapter focuses on the evaluation of the Exercise and Lifestyle Centres intervention. In line with the recommendations of Riddoch's review of exercise referral schemes, a pluralistic approach to evaluation was adopted and a follow up was carried out beyond the duration of the scheme (Riddoch *et al.*, 1998). In order to obtain an estimation of the true impact of the scheme, outcome measures included completion of the intervention, change in physical activity behaviour and changes in self-assessed health. In addition, as advocated by the DoH (2001), the evaluation did

not adopt a randomised control trial design. This is because the referral process was already in place prior to commencement of the evaluation and the scheme aimed to provide support to as many eligible adults as possible. Therefore it would not have been feasible to have a control group who were denied access to the ELC.

The overall aim of the chapter is to explore and gain an understanding about the health and physical activity behaviour of individuals referred to and who participated in the ELC intervention (see Chapter 1 for full list of aims). Firstly it examines the profile of those who were referred into the intervention and how this compares with the adult population in Wirral. The chapter then investigates the profile of those who decided to take part in the intervention and the medical conditions they were referred for. The factors that were found to significantly predict adherence, that is completion of the intervention, are explored and discussed. In addition, the reasons for individuals failing to complete the intervention are examined. The outcomes obtained by those completing the intervention, in terms of changes in levels of physical activity and meeting the recommended levels of physical activity, are analysed. In order to investigate the impact of the intervention beyond its 12 week duration, data on leisure centre attendance three months after the end of the programme and physical activity behaviour and participant views one year after completion of the intervention are explored.

Throughout the chapter, the word intervention, scheme and programme are used interchangeably to refer to the Exercise and Lifestyle Centres (ELC). The word 'centres' forms part of the title of the intervention. This denotes that it is delivered at a number of venues or 'centres' throughout Wirral (see support available on the programme, section 4.2.2).

4.2 Method

4.2.1 Referrals and participants

At the inception of the ELC programme, all GP practices in Wirral were provided with details of the support being offered, the referral criteria and how to refer patients. The programme only accepted referrals from GPs, or other health professionals (e.g. practice nurse). In order to be referred participants had to be resident in Wirral and be sixteen or over (i.e. adults). They also had to have one or more risk factors for coronary heart disease. They were referred if they had obesity

(BMI \geq 30), hypertension (stable and $<180/110$), Hypercholesterolaemia (>6.2 mmol/L) or diabetes (stable). Alternatively they were eligible if they had any three of the following:- inactivity, aged over thirty five, smoker, family history of coronary heart disease, or stress, anxiety or depression. Individuals who had mobility problems, diabetes or previous history of heart problems were not excluded from participating. The only exclusions were individuals with unstable angina, unstable blood pressure or unstable diabetes and those who had previously had a heart attack or angina and had not already been through cardiac rehabilitation.

Before referring an individual, the referrer should have discussed physical activity with them and provided them with a leaflet on the scheme. If they agreed to join the scheme, they would be asked to telephone the ELC office to make an appointment with an exercise adviser. The referrer completed a referral form and faxed this through to the ELC office. This included the referrals gender, date of birth, address, medical condition/risk factors, and the reason for referral. The scheme administrator ensured that the referral complied with the scheme criteria. If they did not, they were returned to the GP. The administrator entered the names, addresses, date of birth and the referring GP details of the acceptable referrals into an access database. Medical and referral conditions were not entered at this stage because these were often incomplete at the point of referral from the GP. When individuals contacted the exercise and lifestyle office the administrator made an appointment for them to see an exercise adviser. If referrals did not contact the ELC to make an appointment with an adviser, they were sent one reminder letter. If referrals still did not contact the scheme after the reminder letter, their referral was returned to the GP. When referrals attended the initial appointment with an exercise adviser, they were classed as commencing the programme and were labelled as a 'participant'.

4.2.2 Support available on the programme

Before starting any activity, participants had an initial appointment with one of six qualified exercise advisers. This enabled them to discuss their current levels of physical activity and to find out more about the support on offer. It also enabled the adviser to assess participant's readiness to change their activity behaviour and to discuss and ascertain their medical history. At this point in the intervention, additional data was collected on a questionnaire and added to the database, including

the main reasons for referral, participant's current level of physical activity and their employment status (see Appendix 4). Data on participant's initial interview date, activity start date, activities and location was also entered on the database.

Support was offered to participants at a number of levels. Those considered at high risk of CHD, or low in confidence, were offered activity (usually from 9am to 5pm on weekdays) supervised by one of the schemes qualified advisers. Those participants considered by their adviser to be able to exercise alone had the option to attend the supervised sessions and in addition could attend other leisure centre activities at any time. Participants received a free pass to leisure facilities in Wirral for a period of twelve weeks. Those participants requiring constant supervision had a pass limited to adviser supervised activities. However, others did not have any time or activity restrictions on when the pass could be used. Participants were also offered advice from their adviser on exercise and lifestyle issues during the twelve weeks they were on the programme.

Activities were agreed with participants according to their personal preferences, circumstances and health condition. Activities ranged from supervised walks and chair exercise classes to swimming, aqua aerobics and fitness suite activity with or without adviser supervision. Advisers also discussed and recommend home based activity with participants. In addition to choice of activity, participants had a choice of activity location. There were four main leisure centres in Wirral, spread geographically throughout the peninsular. In addition to these there were also a five smaller exercise venues offering a range of activities. Participants were issued with a swipe card that allowed them access to the activities at the leisure centres. Each time they attended using this card, the activity information was recorded on the leisure centre database.

4.2.3 Evaluation of the programme

The evaluation of the programme was designed by Helen Beers (the schemes evaluator) and incorporated both process and outcome measures. The process was evaluated in terms of the number of participants attending the programme and their demographic profile (age, gender, and address). The outcome measures were adherence to the programme and the health benefits resulting from it. Adherence was defined as maintaining an increase in physical activity levels at the end of the twelve

week scheme. This could either be in terms of adherence to leisure centre activity or home based activity (i.e. a lifestyle change). The six exercise advisers collected the outcome data in a final interview with participants. This gathered data on progress, including current physical activity, benefits that had been gained from participation and reasons for stopping activity. The data was collected on a questionnaire (Appendix 5) and entered into the scheme's database. The advisers made an assessment of adherence according to self-reports of activity from participants.

In addition to an evaluation at the end of the programme, two longer-term evaluations were also carried out. The first sought to identify leisure centre attendance after the programme had ended. It examined the leisure centre database in order to obtain details on participant's attendance three months after completing the programme. The aim of the second evaluation was to gather data on maintenance of physical activity twelve months after participants had completed the ELC scheme. This took the form of a postal survey of participants, using a short questionnaire (Appendix 6) designed by the evaluator. This questionnaire incorporated questions on current levels of physical activity, maintenance of health benefits and reasons for not maintaining the increase in physical activity. It also invited respondents to provide any written comments they wished. These included praise and criticism for the scheme and reasons why the lifestyle change had not been maintained.

For the purpose of this research study, additional data was gathered from Exercise and Lifestyle centres participants. The aim of this was to explore other factors which were hypothesised to have an impact on physical activity initiation and adherence in a primary care context (see Chapter 5). A sample of participants from the Exercise and Lifestyle Centres were also interviewed in order to gain an understanding of the difference between those who took part in the intervention and those who did not (see Part Three).

4.2.4 Analysis of evaluation data

For the purpose of reporting on the exercise and lifestyle intervention, the data were analysed at descriptive level only. The analysis focused on the areas that were of interest to the management and future potential sponsors of the intervention. These were, what area of Wirral the referrals came from; what percentage completed the 12

weeks; reasons why people dropped out before 12 weeks; what benefits people reported and what percentage saw a decrease in their BMI, blood pressure and cholesterol (physiological measurements). The analysis of physiological measurements has been excluded from this research study. This is because changes in these tell one little about change in physical activity behaviour and are complicated by a range of confounding factors (Riddoch *et al.*, 1998). This study has also interpreted failure to complete the intervention in a different way to that used in the evaluation of the programme. At the end of the programme, if the advisers were unable to contact a participant, or a participant refused to supply information, the participant was excluded from the programmes outcome statistics (in terms of percentages that completed/adhered or dropped out of the programme). This was because the management of the intervention wanted to show adherence rates that were comparable with those of other local interventions. However, for the purpose of this study, it has been assumed that if an adviser had not seen a participant for the 12 weeks, or had been unable to gain information from them, they had dropped out of the programme.

In order to meet the aims of the chapter (see 4.1), the data analysis is structured into five sections (4.3.1 – 4.3.5). The first section looks at the profile of individuals who were referred into the intervention and how representative this was of the total population in Wirral. It investigates three variables namely, gender, age and geographical area in Wirral and uses a chi square analysis to explore whether the gender, age and area from which referrals originate is significantly different from that of the total Wirral population. The data is coded: gender (male = 1, female = 2); Age group (under 35 = 1, 35 – 64 = 2, over 65 = 3); area (Bebington and West Wirral = 1, Birkenhead = 2, Wallasey = 3). Two data sets were used in this analysis. Firstly the ELC database of all referrals into the intervention (over 4,000 records) and secondly data on the gender, age and area profile of all Wirral adults from the Health Authority register of patients database (as used in the Health and Lifestyle Survey, Chapter 3).

The second section of the data analysis used a chi square analysis to explore which referees were significantly more likely to participate in the intervention, in terms of gender, age and area. The ELC access database of all referrals in to the intervention

was imported in to SPSS and this was used as the data set for this part of the analysis (over 4,000 records). In order to gain a better understanding of participants, chi square analysis was used again to examine participant's medical conditions/referral reasons and whether there were any significant differences by gender, age group and area. Gender, age group and area were coded as in the first section. The outcome from the referrals into the intervention was divided into five groups, made contact and had an appointment (i.e. a participant) = 1, did not make contact = 2, inappropriate referral = 3, made an appointment but failed to attend = 4 and did not want to participate or cancelled an appointment = 5. Medical conditions were coded (yes = 1, no = 2) for ten different conditions. The conditions were body mass index (BMI), high blood pressure, high cholesterol, smoking, stress / anxiety or depression, arthritis, asthma / breathing problems, back pain, diabetes, history of cardiovascular disease (heart attack or stroke). Referrals were examined to determine whether there was any significant difference between the five groups in terms of gender, age and area. This was carried out using the chi square statistic in SPSS. The same process was carried out for participants and medical conditions. The first medical condition was compared with gender, then against age, then against area to determine if there were any significant differences. This process was repeated for each medical condition in turn. The significant findings are shown in section 4.3.2.

The third stage in the data analysis focused on those who participated in the intervention between 1st October 2001 and 31st January 2002. Starting the data collection in October 2001 meant that the evaluator had been able to research models of health behaviour, review relevant literature and design data collection forms. A four month time period was selected due to time pressure in the initial consultation which made it difficult for data to be collected over a longer period. During this time period, an additional questionnaire was used to collect data from 240 participants when they started the programme (Appendix 7). The aim was to track these participants through the intervention and then to use the data from the two questionnaires in order to compare those who adhered to the intervention (completed) with those who did not (drop out). Variables were collected and coded up in SPSS (Table 4.1). In addition to these variables, other data relating to Wallston's MSLT was also collected (see Chapter 5, 5.2.2).

Table 4.1

Variables collected at the start of the ELC programme

Variable	Code
Postcode. (Converted in to the corresponding deprivation index score)	Continuous from 0 to 100, and also categorical in quartiles, from 1 - 4.
Body mass index (BMI).	Continuous.
Obesity	4 categories; normal weight BMI under 25 = 1, overweight BMI 25 to 29 = 2, Obese BMI 30 to 39 = 3, Clinically obese BMI 40 or over = 4
Nine individual medical variables:- blood pressure, cholesterol, smoker, stress, back pain, arthritis, asthma, diabetes, heart problem or stroke	Each variable coded yes = 1, no = 2
Self-rated health in general at the start of the programme	5 categories. Excellent = 1, very good = 2, good = 3, fair = 4, bad = 5.
Seven variables that participants predicted may be potential barriers to completion:- Psychological, too busy, dislike of exercise, cost, lack of support, physical and transport.	Each coded yes = 1, no = 2
Gender	Male = 1, female = 2
Marital status	Four categories:- single = S, married = M, widowed = W, separated or divorced = SD
Employment status	working full time = 1, working part time = 2, unemployed and looking for a job or never had a paid job = 3, unable to work due to illness or disability = 5, retired = 6, student = 7 and housework, not looking for paid employment = 8
Age Age group	Continuous Categorical, under 35 = 1, 35 – 64 = 2, 65 and over = 3
Physical activity behaviour at start of intervention	no = 0, yes = 1
Meeting physical activity recommendations at the beginning of the intervention	yes = 1, no = 2

In an interview at the end of the intervention exercise advisers collected outcome data from participants (see 4.2.3). This data was coded as follows:-

Completed the intervention (no = 0, yes = 1).

Meeting physical activity recommendations at end of intervention (yes = 1, no = 2).

Self-rated health in general at the end of the programme (5 categories, excellent = 1, very good = 2, good = 3, fair = 4, bad = 5).

Reasons for dropping out of the intervention (unable to contact or refused to provide feedback = 1, never started / changed mind = 2, too busy = 3, back pain = 4, family / personal problems = 5, health problems or illness = 6, Lack of motivation = 7).

Using the chi square statistic in SPSS, each of the variables collected at the start of the programme was analysed to see if there was any significant difference between the variable and whether participants completed the intervention or not. For example, age was entered as the start variable and complete or drop out as the outcome variable, the chi square analysis was run and the result noted. Then gender was entered as the start variable, with complete or drop out as the outcome variable etc.

In order to take this analysis a stage further, logistic regression analysis was carried out on the data. The aim was to explore which combinations of the variables explained the greatest percentage of variance in physical activity behaviour. Using the analyse, regression, binary logistic regression facility in SPSS, completing or not completing the intervention was entered as the dependent variable. Each of the variables that were identified in the univariate chi square analysis, as significant predictors of completing the intervention, were entered into the logistic regression model, as independent variables (or covariates), in the order of their chi square value, largest first. As each variable was added in to the model, the percentage of variance predicted was compared to that of the previous model. If the addition of a variable reduced the percentage of variance predicted it was removed from the model. If it did not, it remained in the model. This process was repeated for each of the statistically significant variables.

In order to provide an indication of why participants failed to complete the intervention, their reasons for dropping out were analysed into seven main themes (see coding above). The findings have been shown at descriptive level only, in order to provide an overview of why participants failed to complete. Failure to continue activity is an area that is explored in more details in the final stage of the evaluation. Inactivity and failure to take part in the intervention also forms a key part of the qualitative sections (see Chapters 7 to 9).

The fourth stage in the analysis explored whether the intervention was successful in increasing levels of physical activity in those who completed the 12 weeks (4.3.4). In particular whether the intervention enabled participants to meet the required levels of physical activity to reduce the risk of CHD. In addition, the analysis builds on the findings from the Wirral Health and Lifestyle Survey (Chapter 3) and explores the four factors that were found to predict meeting physical activity recommendations (i.e. gender, age, self-rating of health in general and employment status).

The ELC access database of all referrals in to the intervention (over 4000 records) was sorted in to those who had completed the intervention and those who had not. A new spreadsheet file was created that contained information just on those who had completed the intervention. This data was imported in to SPSS and used in this part of the analysis. Using the chi square statistic in SPSS, participant data was examined to determine which variables were significant predictors of physical activity behaviour. The variables used in the analysis and their coding was as follows:-

Change/increase in physical activity levels at end of intervention (yes = 1, no = 2).

Meeting physical activity recommendations at end of intervention (yes = 1, no = 2)

Gender (coded as in Table 4.1).

Age (categorical as in Table 4.1).

Self-rating of health in general at the end of the intervention (5 categories, excellent = 1, very good = 2, good = 3, fair = 4, bad = 5)

Change in self-rated health in general (much better = 1, somewhat better = 2, the same = 3, worse = 4).

Employment status (coded as in Table 1). However, due to the limitations of the chi square test, employment was treated as a dichotomous variable in some cases (work was coded as 1 and not work was coded as 2).

Two measures of physical activity behaviour were examined in this part of the evaluation. Firstly an increase in the level of physical activity whilst on the programme and secondly whether participants met the recommended levels for physical activity at the end of the programme.

The fifth final stage in the data analysis explored physical activity at two points in time after the intervention. The first investigated leisure centre attendance three

months after completion of the intervention and the second explored general physical activity a year after the intervention. To obtain information on the level of leisure centre attendance after the end of the intervention data on a sample of participants was extracted from the leisure centre database. The sample was those participants used in stage three (i.e. 240 participants who started the intervention between 1st October 2001 and 31st January 2002). The number of times a participant had attended the leisure centre after completing the scheme was added to their SPSS record. Those who had attended at least once a week for the three months following the end of the intervention were classed as still attending (coded, attending = 1, not attending = 2). The other variables in the analysis and their codes were the same as in stage three of the evaluation.

The second part of the longitudinal evaluation was carried out between March 2003 and May 2003. This time period was selected since time pressures only permitted a follow up of some of those who had completed the intervention. In addition, data needed to be gathered, analysed and reported on prior to the scheme finishing in July 2003. A self-completion postal questionnaire (Appendix 6), a covering letter (Appendix 8) and a postage paid enveloped were sent to a sample of participants one year after they had successfully completed the intervention. The sample was those participants who had completed the intervention between 1st February 2002 and 30th April 2002 (500 individuals). The questionnaire was divided in to two sections. Firstly it collected information on current activity levels. Using the chi square statistic in SPSS, participant data was examined to determine which variables were significant predictors of physical activity behaviour one year after the intervention.

The variables used in the analysis and their codes were as follows:-

Meeting physical activity recommendations at end of intervention (yes = 1, no = 2).

Meeting physical activity recommendations one year after intervention (yes = 1, no = 2)
Gender (coded as in Table 4.1).

Age (categorical as in Table 4.1).

Employment status (coded as in Table 4.1).

Marital status, (coded as in Table 4.1).

Self-rating of health in general at the end of the intervention (5 categories, excellent = 1, very good = 2, good = 3, fair = 4, bad = 5)

Area (Bebington and West Wirral = 1, Birkenhead = 2, Wallasey = 3).

The second section of the questionnaire asked participants for their comments on the intervention, including any benefits they had obtained from it and reasons why they had stopped physical activity. The comments were analysed under five main domains that have been identified as barriers to physical activity by the Allied Dunbar National Fitness Survey, (1992). These were physical, emotional, motivational, time and availability. A distinction was not made between those who met physical activity recommendations and those who did not. This was because of the difficulty encountered in obtaining accurate measurements of physical activity behaviour (see Discussion 4.4). The outcomes in terms of benefits that participants reported had resulted from the intervention provided some indication of why participants had maintained activity throughout the 12 weeks. The negative comments about the programme enabled recommendations to be made about the intervention (Chapter 11). They also highlighted some of the barriers to physical activity participation. A greater understanding of the barriers to continuing activity was also obtained from the reasons participants gave for being inactive 12 months after the end of the intervention.

4.3 Results

4.3.1 Referrals to the intervention

The adult population registered with GPs in Wirral is approximately two hundred and sixty three thousand. Based on the findings from the survey (Chapter 3) almost 60% of these individuals lead a sedentary lifestyle. This equates to approximately seventy thousand men and eighty five thousand women. In the first two years since its inception, over 4000 adults in Wirral had been referred to the ELC. This means that 2.8% of the sedentary population were referred in to the ELC programme (2% of men and 3.5% of women).

The profile of adults referred to the ELC differed significantly in three respects from the adult population resident in Wirral, in terms of gender, age and geographical distribution. For every one man who was referred, two women were referred ($\chi^2 = 409.83$, $df = 1$, $p = 0.001$). For every one over 65 year old who was referred two 35-64 year olds were referred ($\chi^2 = 391.95$, $df = 2$, $p = 0.001$). Referrals were not representative of the population resident in each of the areas in Wirral. For every one person referred from Bebington and West Wirral, two people were likely to

come from the Wallasey area ($\chi^2 = 343.63$, $df = 2$, $p = 0.001$). This was despite the fact that Bebington and West Wirral has twice the population of Wallasey.

4.3.2 Participation in the intervention

Participation in the intervention was optional and a total of 71% of those who were referred made an appointment and attended for an initial interview. Some individuals did not contact the intervention (18%) and there were a number of inappropriate referrals (8%). A small percentage of referrals made an appointment and then did not attend (1%) and others made an appointment which they subsequently cancelled (0.5%). In addition, some referrals contacted the intervention to say that they did not want to take part (1.5%). The average participant was likely to be obese and approximately fifty years old (Table 4.2).

Table 4.2

Participants in the ELC

	Mean	Std. deviation	Range
Age	50.37	13.79	16 – 79
BMI	32.74	6.84	18 – 51

Both age group and the PCG area from which referral came from were significant predictors of attending an initial interview with an exercise adviser. Although gender was not a significant predictor of participation or inappropriate referrals, women were more likely to attend an appointment than men, and men were more likely to be inappropriately referred. The under 35s and over 65s were less likely to participate than expected. Whereas the 35 to 64 age group were significantly more likely to attend ($\chi^2 = 200.43$, $df = 8$, $p = 0.001$). Inappropriate referrals were significantly more likely to have come from the over 65 age group. In addition, this age group was the most likely to have contacted the intervention to say that they did not want to participate. The under 35 age group was the most likely not to have made contact and also to have made an appointment and failed to attend. Those referred from the Bebington and West Wirral area were significantly more likely to have made contact and attended an appointment with an exercise adviser ($\chi^2 = 23.32$, $df = 8$, $p = 0.003$). Inappropriate referrals were least likely to have come from the Birkenhead area and most likely to have come from the Wallasey area. There were some variations in the medical conditions for which participants were referred.

These were by gender (Table 4.3), age (Table 4.4) and PCG area (Table 4.5). There were significant gender differences in seven medical conditions (Table 4.3).

Table 4.3

Gender differences in medical conditions of ELC participants

	χ^2	df	<i>p</i> =
BMI	40.18	1	.001
High blood pressure	16.18	1	.001
Stress, anxiety or depression	41.66	1	.001
Arthritis	11.61	1	.001
Asthma or breathing problems	3.97	1	.046
Diabetes	23.05	1	.001
History of cardiovascular disease	63.09	1	.001

Women were significantly more likely than men to be referred for obesity, stress and arthritis. However, men were more likely to be referred for high blood pressure, asthma/breathing problems, diabetes or previous cardiovascular episodes (heart attack or stroke). There were no significant gender differences in levels of cholesterol, back pain or smoking, although women were more likely to smoke than men. There were nine medical conditions that differed significantly by age group. The findings are shown in Table 4.4 and an explanation of the differences between the three age groups is given after the table.

Table 4.4

Age differences in medical conditions of ELC participants

	χ^2	df	<i>p</i> =
BMI	110.81	2	.001
High blood pressure	90.34	2	.001
High cholesterol	34.95	2	.001
Smoking	8.39	2	.015
Stress, anxiety or depression	122.62	2	.001
Arthritis	58.16	2	.001
Asthma or breathing problems	13.05	2	.001
Diabetes	9.16	2	.010
History of cardiovascular disease	118.84	2	.001

The under 35s were significantly more likely than expected to be obese, to be smokers, and to have stress/anxiety/depression. However, they were significantly less likely than expected to have high blood pressure, high cholesterol, arthritis/mobility problems, asthma/breathing problems, diabetes, or to have had heart problems or a stroke. The 35 to 64 age groups were significantly more likely than expected to be obese, to have high blood pressure, high cholesterol, to have stress/anxiety/depression, arthritis/mobility problems and diabetes. They were significantly less likely than expected to have asthma/breathing problems or to have had heart problems or a stroke. The 65 and over age group were significantly more likely than expected to have high blood pressure, arthritis/mobility problems, asthma/breathing problems, diabetes and to have suffered heart problems or a stroke. However, they were significantly less likely than expected to be obese, to be smokers, or to have stress/anxiety/depression. There were seven medical conditions that differed significantly by PCG area (Table 4.5).

Table 4.5

Differences in medical conditions of ELC participants by geographical area.

	χ^2	df	<i>p</i> =
BMI	7.33	2	.026
High blood pressure	15.12	2	.001
High cholesterol	11.01	2	.004
Stress, anxiety or depression	17.06	2	.001
Back pain	9.26	2	.010
Diabetes	10.17	2	.006
History of cardiovascular disease	71.24	2	.001

Individuals from the Bebington and West Wirral area were significantly more likely than expected to have high blood pressure, high cholesterol, back pain, diabetes, or to have had heart problems or a stroke. However, they were significantly less likely than expected to be obese, or to have stress/anxiety or depression. Individuals from the Birkenhead area were significantly more likely than expected to be obese, to have high cholesterol, to have stress/anxiety or depression, or diabetes. They were significantly less likely than expected to have high blood pressure, back pain, or to have had heart problems or a stroke. Individuals from the Wallasey area were significantly more likely than expected to be obese, or to have back pain. However,

they were significantly less likely than expected to have high blood pressure, high cholesterol, diabetes, or to have had heart problems or a stroke.

4.3.3 Adherence to the intervention

At the end of the intervention, 61% of those who attended for an initial appointment (classed as initiation) had continued to exercise. There was a significant difference between ten variables and whether participants had continued to exercise for the duration of the intervention or had dropped out before completing the 12 weeks (Table 4.6)

Table 4.6

Factors associated with completing (adherence to) the ELC

	χ^2	df	<i>p</i> =
1. Employment status	18.26	5	.003
2. Obesity	13.65	3	.003
3. Health in general	11.07	3	.011
4. Deprivation	9.04	3	.029
5. Stress, anxiety or depression	8.00	1	.005
6. Past behaviour	7.32	1	.007
7. High blood pressure	7.07	1	.008
8. Age group	6.87	2	.032
9. Barrier – transport	6.56	1	.010
10. Smoker	5.99	1	.014

Participants who were retired were significantly more likely to complete the intervention. Those with a BMI of forty or more (i.e. morbidly obese) were significantly more likely to drop out of the intervention, whereas those with a normal BMI of under twenty five were more likely to complete it. In addition to BMI, three other health conditions were found to be significant predictors of completing the intervention. Firstly, those without stress, anxiety or depression were more likely to complete. Secondly, those with high blood pressure were more likely to complete and thirdly, non-smokers were more likely to complete the intervention. High cholesterol, back pain, asthma, diabetes, heart problems, arthritis or family history of heart disease were not found to predict adherence to the intervention.

Participants who rated their health in general as very good or good at the beginning of the intervention were significantly more likely to complete the 12 weeks. Those from the wards with the lowest deprivation index in Wirral were also more likely to complete the intervention (this would be predominantly those from the Bebington and West Wirral area). Participants who reported taking part in some form of activity when they started the intervention were more likely to complete the 12 week intervention than those who had not participated in activity in the past. Age group was also a factor that significantly predicted adherence to the intervention. Individuals aged 65 or over were more likely than expected to complete the 12 weeks. Marital status and gender were not found to be significant predictors of adherence to the intervention. However, men were more likely to complete the 12 weeks than women. In addition, there was only one barrier that participants predicted at the beginning of the intervention that significantly predicted drop out before 12 weeks and this was lack of transport. The other barriers (time, enjoyment, cost, lack of support and pain) did not predict drop out from the intervention.

Results of logistic regression analysis found that a combination of seven of the ten variables identified in the univariate chi square analysis predicted 74.2% of the variance in adherence behaviour (Table 4.7). Past physical activity behaviour, high blood pressure and smoking did not improve the level of prediction of the logistic regression model.

Table 4.7

Logistic regression model for adherence to the ELC

	% of variance	χ^2	df	p =
Employment status & obesity	66.2	25.24	6	.001
Employment status, obesity and health in general	66.2	29.01	9	.001
Employment status, obesity, Health in general and deprivation	68.0	30.99	10	.001
Employment status, obesity, health in general, deprivation and stress	72.4	35.22	11	.001
Employment status, obesity, health in general, deprivation, stress and past behaviour	72.0	38.56	12	.001
Employment status, obesity, health in general, deprivation, stress and high blood pressure	71.6	39.78	12	.001
Employment status, obesity, health in general, deprivation, stress and age	72.4	35.23	12	.001
Employment status, obesity, health in general, deprivation, stress, age and transport	74.2	37.80	13	.001
Employment status, obesity, health in general, deprivation, stress, age, transport and smoker	72.0	39.25	14	.001
Employment status, obesity, health in general, deprivation, stress age and transport	74.2	37.80	13	.001

The model that correctly predicted the largest amount of variance in adherence behaviour consisted of employment status, obesity, self-rated health in general, deprivation, stress, age and transport. Therefore, those individuals most likely to complete the intervention were retired, of normal weight, in good health, from areas of low deprivation, had no stress, anxiety or depression, were aged over 65 and had access to transport.

The 39% of participants who did not complete the intervention were labelled 'drop outs'. Participants were classified as dropping out of the programme if they had not increased their physical activity or had stopped exercising on all of the intervention based activities at any time before the end of the 12 weeks. In addition, if the exercise adviser had not seen them during the 12 weeks or had been unable to make

contact with them or they had refused to provide feedback, they were also deemed to have dropped out before the end of the 12 weeks. Participants gave a number of reasons for failure to adhere to the 12 weeks of the programme (Table 4.8).

Table 4.8

Reasons for failing to complete the ELC intervention

	(n=)	As a percentage of total drop outs (%)
Health problems or illness	35	38
Unable to contact / or refused to provide feedback	18	20
Never started / changed mind	15	16
Family / personal problems	10	11
Too busy	9	10
Lack of motivation	5	5

The most frequently given reason for not completing the intervention was health problems or illness (38% of drop outs). This included anxiety/depression, arthritis, operations, injury and back pain. This equates to 13% of those who started on the programme. In addition, it is interesting that having complied with the advice of their GP, 16% of those who had an interview with an adviser decided not to initiate activity.

4.3.4 Impact of the intervention on physical activity (and factors that determine the impact)

Change in levels of physical activity

The intervention was successful in changing the level of physical activity in 91% of those who completed it. Results of chi square analysis showed no significant difference between whether participants were working or not and a change in their levels of physical activity over the 12 weeks of the scheme. In addition, there was no significant difference between gender and change in physical activity. However those participants who reported a positive change in their self-rating of health in general at the end of the 12 weeks were significantly more likely to have changed their levels of physical activity ($\chi^2 = 43.03$, $df = 3$, $p = 0.001$). In addition, those participants who rated their health as fair at the end of the intervention were less likely than expected to have changed their levels of physical activity, whereas those rating their health as very good were more likely to have changed ($\chi^2 = 13.77$, $df =$

4, $p = 0.008$). There was also a significant difference between age group and whether participants had changed their levels of physical activity during the 12 weeks. The under 35's were less likely than expected to have changed their activity levels, whereas the over 65's were more likely to have changed ($\chi^2 = 7.05$, $df = 2$, $p = 0.029$).

The participants who were most likely to have increased their levels of physical activity whilst on the programme were aged 65 or over, rated their health as very good at the end of the 12 weeks and believed that their health had improved as a result of attending the programme.

Meeting recommended levels of physical activity

At the end of the intervention, 52% of participants were meeting the recommended levels for physical activity. Those who rated their health in general as good or better than good at the end of the 12 weeks, were significantly more likely to meet the recommended levels of physical activity ($\chi^2 = 16.70$, $df = 4$, $p = 0.002$). Age was also a significant predictor of meeting the recommended levels of physical activity. Those in the under 35 age group and the over 65 age group were less likely than expected to meet the recommendations, whereas those aged between 35 and 64 were more likely than expected to meet the recommended levels of physical activity ($\chi^2 = 7.15$, $df = 2$, $p = 0.028$)

There was no significant difference between men and women and the likelihood of them meeting the recommended levels of physical activity. However, women were less likely than expected to meet the recommended levels of activity and men were more likely than expected to meet recommendations. Employment status was also not a significant predictor of meeting the recommended levels of physical activity at 12 weeks. Findings suggest that the programme was most successful in increasing levels of physical activity in the over 65 age group however, this increase was not sufficient to meet the recommended levels of physical activity. The measure of self-rated health in general at the end of the programme successfully predicted which participants increased their levels of physical activity on the programme and also predicted which participants met the recommended levels of physical activity. Those participants rating their health as good or better than good were more likely to

increase their levels of activity whilst on the programme and to meet the recommended levels of physical activity.

4.3.5 Physical activity after the intervention

Three months after the intervention

Six months after starting the intervention, (that is 3 months after the end of the intervention), 13% of participants had continued to use the leisure centre facilities at least once a week. However, this statistic rises to 21% if it is viewed as a percentage of those participants who successfully completed the intervention. Therefore, of the 61% of participants who successfully completed the 12 week intervention, 21% of them had continued to use the leisure centre facilities at least once a week for the 12 weeks after completing the intervention. There was no significant difference between the majority of the variables and whether participants had continued to use the leisure centre or not. For example, there was no significant difference between attendance at the leisure centre after six months and BMI, self-rated health in general, gender, age group, employment status, meeting recommendations for physical activity at 12 weeks, deprivation score, the activity type or venue or most of the perceived barriers. However, for those who completed the 12 week intervention, there was a significant difference between belief that pain was a barrier to physical activity and whether they had continued to use the leisure centres ($\chi^2 = 3.93$, $df = 1$, $p = 0.047$).

Twelve months after the intervention

One year after they had successfully completed the programme, 34% of participants responded to a follow up ($n = 181$, see methods 4.2.4). Analysis of the data from respondents found that 76% of them had continued to exercise during the 12 months following the intervention. The most common activities were walking (68%), attending a fitness suite (30%) and swimming (12%). However, only 43% (78/181 respondents) were meeting physical activity recommendations when they finished the intervention. In addition, only 23% of those (43/78) who met the recommendations at 12 weeks were still meeting the recommendations after one year. Most interestingly, 34 of those who did not meet recommendations at 12 weeks, reported that they were meeting the recommendations at one year. One year after completing the intervention, the only variable that predicted meeting the

recommended level of physical activity was PCG area ($\chi^2 = 9.02$, $df = 2$, $p = 0.011$). Participants from Birkenhead or Wallasey were significantly more likely, than those from Bebington and West Wirral, to meet the recommended levels of physical activity. This variable did not predict meeting the recommendations at the end of the intervention.

Respondents made both positive and negative comments about the scheme. They also gave reasons why they had not maintained physical activity. These have been analysed into the five broad domains (Table 4.9), that have been identified as barriers to physical activity by the Allied Dunbar National Fitness Survey (HEA, 1992). The comments show the benefits that were gained from participation. These benefits have been analysed under the physical and emotional themes. However, these benefits are also suggested to have contributed towards motivation to maintain participation in physical activity.

Table 4.9
Factors affecting adherence to physical activity

	Comments		Reasons for lack of maintenance (n=)	Total (n=)
	Positive (n=)	Negative (n=)		
Physical	20	1	11	32
Emotional	18	2	1	21
Motivational	8	2	4	14
Time	0	0	8	8
Availability	4	8	6	18

Physical

A number of respondents commented that they had gained physical benefits as a result of participation in the intervention (n=20). Some of these benefits were reported to be in terms of an increase in energy or fitness with participants feeling revitalised or less sluggish (n=8). Other benefits were an improvement in mobility and other physical conditions such as arthritis, balance or pain (n=12). For example, one participant described how:

My mobility improved and the programme helped me to join a gym. Before this I was unsure as to if this would help my legs, I thought my legs were too weak (F/51/450).

This suggests that there was a change in this participant's self-efficacy in terms of capability to take part in activity whilst they were on the 12 week intervention. However, one participant made a negative comment and reported that activity had made their health problem worse. She explained that she was:

referred to help improve suppleness due to fibromyalgia. The exercise made the problem flare up and I have been ill ever since. It did not have quite the impact I had wanted. I would not do it again. (F/37/1010).

Physical reasons were also the most commonly cited reason for failure to maintain activity beyond the 12 week intervention (n=11). A number of participants believed it was too painful for them to exercise (n=4). Some had stopped exercising due to operations or accidents (n=3) and others had experienced a deterioration in their health condition (n=3). However, one participant reported that she:

...finds it hard, since I have so much weight to loose (F/37/1489)

and another explained that:

After the programme I joined a local gym. My programme was altered & I injured my back. I put on weight & was totally dejected (F/43/712).

These findings highlight a number of physical barriers to physical activity such as being overweight and sustaining injury. They are explored in more depth in the qualitative chapters (Part Three).

Emotional

A number of participants commented that they had obtained emotional benefits from participation in physical activity (n=18). The two most frequently cited ones were confidence (n=6) and control of stress (n=5). For example, one participant said:

Overall the programme worked for me it taught me that with patience healthy eating and regular exercise not only do you feel healthier, you feel more confident and alive. But most of all you feel you have control (F/43/712).

The comment from this participant suggests a change in locus of control. This is explored in depth in Chapter 7. However, after finishing the intervention she incurred an injury (see physical section above) and this prompted emotions of 'dejection'. Another participant's comment also indicates elements of internal locus of control when she talked about 'self-help' and said:

My thanks for the opportunity for self-help to health. I have lost 3 stone to date and feel 100% better. Your programme proves that in the long term the

best things in life are free and simply achieved and have a knock on effect on personal living style (F/64/402).

Other participants made reference to confidence and reported that:

The programme really helped me get into fitness. I'm enjoying keeping it up. My stress levels seem better controlled when I've been to the gym (F/40/311).

and that:

Aerobics and aqua aerobics have given me more confidence in myself and helped me with my stress and blood pressure. I can walk better and enjoy aerobics (F/70/682).

Both of these narratives suggest that participants have taken self-responsibility for their health. This is explored in Chapter 7. They also mention enjoyment, which is one of the factors motivating them to maintain activity. This is expanded on in the next section on motivation. In contrast, two respondents reported some negative emotional aspects of participating in physical activity. One said that:

I felt very uncomfortable every time I entered the gym to the extent I felt like a freak (F/38/460).

And the other explained that:

Comments made in the gym about 'oversized' people has put me off going to the gym for life (F/45/675).

These comments highlight how feelings of embarrassment and sensitivity about taking part in physical activity and also the perceptions of others can be barriers to activity.

Motivational

Enjoyment of physical activity was often mentioned in conjunction with the emotional benefits of physical activity. In addition, a number of participants merely commented on their enjoyment of the intervention (n=8). Two of them suggested that the advisers had been a factor that had contributed to this and said:

I found the advisers very helpful and enthusiastic and enjoyed the 12 weeks very much (M/53/237).

Your advisers were most helpful and caring and I enjoyed the course (F/72/700).

These comments also suggest that the adviser provided the 'some one to do it with', which is one theme in the availability domain (see availability section later). The

adviser support may also have been a factor that contributed towards their motivation to participate. However, once this support finished, there is evidence to suggest that participants found it difficult to maintain physical activity. For example, one participant commented that:

Whilst on the programme I lost weight & this improved me mentally and physically. I missed the control and advice and slowly slipped back into bad eating habits. I would welcome advice and assistance, even every 3 months it would give encouragement by any backslides (F/45/132).

This participant had stopped physical activity despite gaining positive benefits from it. Another participant had also stopped because she felt she:

...needed moral support (F/42/419).

Another said that:

I enjoyed my 12 weeks. It directed me and made me make an effort to exercise even though my condition is painful. Pity it was only for 12 weeks (F/51/519).

These comments suggest a lack of self-responsibility and internal motivation or control. Some of the other comments from respondents suggested that the motivation to participate in physical activity ceased when the desired benefits were not obtained. For example, one participant commented that:

I gave up cigarettes for 8 months and went to the gym 2 to 3 times a week for 6 months and my weight went up. With all the hard work I put into this I was discouraged and just called it a day, went back to the cigarettes and I have lost one stone (F/68/393).

Motivation also ceased if it was discovered that the required benefits could not be achieved via physical activity, as the following woman illustrated when she said:

I kept up exercise until my GP said high cholesterol was genetic – now I take tablets to reduce it (F/51/965).

This suggests that the problem is due to chance and that physical activity would not have an impact on it. It also suggests that an easier solution has been found.

Another participant who made reference to their GP said that:

I would exercise if they (the GP) thought it would help my condition (F/83/353).

This comment shows that they accept and believe the advice from powerful others that there is no benefit to be gained from physical activity. This is explored in more detail in Part Three.

Time

Time was a reason that was cited for lack of maintenance of physical activity after the 12 weeks (n=8). In some instances this was lack of time due to family or caring responsibilities (n=3). For example participants said that:

I care for family who are disabled and have difficulty exercising due to this (F/40/496)

and:

My husband has been ill so I have not been able to maintain my exercise (F/69/668)

In other instances inability to maintain was due to lack of time due to work (n=3), as one participant highlighted when she commented that:

Working long hours prevents time for self for exercise. I did feel better but I am unable to find time for myself, I'm back to a poor body image (F/41/476).

All of the participants who commented about lack of time were women, although this was due to both work and caring responsibilities.

Availability

This domain included the suitability of the facilities (including support), the costs associated with physical activity and having some one to do it with. The first theme that emerged from the data was the timing of the activity and availability of the supervised support. This was something that a number of participants mentioned in a negative way (n=8). For example, one participant said:

I work 9 - 4 & did not get any support since the classes were all during the day. The GP did not tell me this when I agreed to join the programme (F/38/460).

This comment indicates the level of information that GPs communicated to patients about the intervention, (this is expanded on in Chapter 7). It also shows how individuals want the support to meet their specific needs. Other participants who commented on the support not meeting their needs and preferences said:

I enjoyed the exercise. I didn't like having to be there for 10am, it was a rush. When you are retired you don't want early morning rushes (F/67/668).

and:

I found little benefit in the programme beyond free access to swimming. No support, no new information, little understanding of my needs. Whilst the idea was good in principle, it was poorly executed (F/33/407).

and:

I still feel frustrated about diet, information you offer on this is very general, versus very specific with exercise (M/27/440).

and:

I use a cycle at home and prefer walking in the open air to a gym (M/61/648).

The last two comments highlight how the intervention was focused on physical activity within leisure centre facilities. They also indicate the expertise and preferences of the exercise advisers (i.e. there was a tendency to only offer support to those who were willing to work in a fitness suite). Evidence for this is the following comment from a woman who said:

I felt the aqua aerobic exercises were not encouraged enough. The gym based exercises are pushed, but I found these were not for me. None of the instructors were present at the aqua sessions (F/39/813).

Temporary closure of leisure facilities was also an issue which contributed to lack of maintenance for some participants (n=2). This led to disruption of their physical activity routine and consequently to cessation of activity due to them being unable to travel to alternative venues.

The second theme in this domain is cost. This was another factor that contributed to participants ceasing to maintain their increase in physical activity (n= 4). For example one said that:

I really enjoyed using the gym but due to expenses could not afford to take up membership. Since stopping at the gym I have gone back to old bad habits (M/52/778).

and another said that:

I find it impossible to pay for gym and diet is costly. This should be on the NHS (M/60/300).

This example illustrates how participants do not believe it is their responsibility to pay for health related activity. That is, they believe it should be the responsibility of others (this is discussed in more detail in Chapter 7).

The cost of activity also explained lack of regular activity by another participant who said:

I enjoyed myself at the gym. I would like to do this programme again since it gave me a lot of confidence and motivation. Being on widow's benefit I can't afford to go on a regular basis. The course certainly was a medicine I needed (F/49/510).

Enjoyment of the intervention and gaining emotional benefits from it were not sufficient to motivate this participant to maintain regular activity. This comment is also interesting because it uses the word 'medicine'. This suggests that physical activity was perceived as a short-term prescription from the GP, i.e. something to be taken until the prescription ran out. It also suggests that enjoyment is only one factor out of a complex interaction of variables that contribute towards participation in physical activity. This suggests that barriers, such as cost, can outweigh any enjoyment or benefit that is obtained from physical activity.

The final theme in this domain was having someone to do the activity with (n=4). Some participants felt the adviser provided this for them (see the earlier motivational section). Others commented on the social benefits they obtained from exercising with others (n=2) and for example said:

I have continued to attend. Although I find it hard at times because of my condition, I also find it very therapeutic meeting with other people (M/74/414).

and:

doing the exercises helped me to talk to other people in the same boat. I was very shy before I joined the club and this has improved (M/68/794).

The social aspects of participating in physical activity were therefore particularly important in enabling some participants to maintain activity. The comments in this section highlight areas where improvements could be made to the ELC.

Recommendations will be discussed in Chapter 11.

4.3.6 Summary

Referrals into the ELC were most likely to be women, the 35 to 64 age group and those living in the Wallasey area. Whilst men and women were equally likely to participate, those from Wallasey were significantly less likely than expected to participate, along with the under 35 and over 65 age groups. Men and women who participated in the intervention had significantly different referral reasons. Women were more likely to be referred for obesity, stress and arthritis, whereas men were more likely to be referred for high blood pressure, asthma/breathing difficulties, diabetes or previous cardiac episodes. There were also some significant differences in referral reasons by age group and geographical area. The under 65s were most likely to be obese and less likely to have had a heart attack or stroke. However, those aged 65 and over, whilst less likely to be obese, were more likely to have a range of health problems, including heart conditions. Individuals living in the Birkenhead and Wallasey areas were the most likely to be referred for obesity, whereas those in the Bebington and West Wirral were referred for a variety of other health problems.

Approximately two thirds of participants (61%) completed the ELC programme. These individuals were most likely to be aged over 65, retired, of normal weight, in good health, from areas of low deprivation, without stress, anxiety or depression and with access to transport. Just over half of them were taking part in sufficient physical activity to meet the recommended levels required to have a positive effect on health and on the risk factors for CHD. These individuals were most likely to be in the 35 to 64 age group and to rate their health in general as good or better than good at the end of the programme. The ELC was most successful in increasing levels of activity in the over 65 age group, although this activity was not sufficient to meet the recommended levels. Self-rated health in general was the best predictor of an increase in activity and also of meeting activity recommendations. Three months after completing the ELC, 13% of participants had continued to use the leisure centres. In addition, one year after completing the intervention, 23% of participants had continued to meet the recommended levels of physical activity. Whilst PCG area did not predict whether participants met the recommended levels for physical activity at the end of the programme, it did predict whether they were meeting them one year after the intervention. However, due to the problems in obtaining an

accurate measurement of physical activity, these findings should be viewed only as an indication of the true picture

Some factors supporting maintenance of physical activity during the programme, were enjoyment, having someone to do it with and obtaining physical and emotional benefits from it. In contrast, those most likely to drop out before the end of the programme were the morbidly obese and those rating their health as less than good. The most frequently given reason for failure to complete the ELC was health problems or illness. In addition, participants were likely to fail to continue activity beyond the end of the ELC due to pain, deterioration in health (including injury from activity), lack of time and cost.

4.4 Discussion

4.4.1 Introduction

The survey (Chapter 3) identified that almost 60% of the adult population in Wirral have a sedentary lifestyle. However, the evaluation showed that less than 3% of them were referred to the ELC. This would confirm findings from other studies that conclude that exercise referral schemes are unlikely to contribute to population levels of physical activity (Harrison *et al.*, 2005). The current study found that the profile of referrals in to the ELC was not representative of the adult population in Wirral. In addition, certain groups were more likely to participate in the ELC than others. Referrals and participants are discussed in the next section (Section 4.4.2). Accurately measuring physical activity is difficult. This has had an impact on whether participants were classified as meeting the recommended levels of physical activity or not and in addition, whether they adhered to the ELC programme. Factors that influence adherence to the ELC and continuation of physical activity beyond the ELC are discussed in section 4.4.3.

4.4.2 Referrals and participants

There are a number of possible explanations why more women than men are being referred into the intervention. Firstly, men and women differed in their referral conditions. Whilst both had risk factors for CHD, men were more likely to have suffered from CHD and women were found to have greater levels of obesity, (as highlighted in the survey, Chapter 3). Obesity was the most common reason for referral and evidence from the qualitative sections (see Part Three) indicates that the

intervention may primarily have been perceived as a weight management scheme. Indeed once the ELC intervention came to the end of its funding in July 2003, the new format had a focus on healthy eating and the physical activity component was dramatically reduced. In addition to having greater levels of obesity than men, women have also been suggested to be more ready to report illness than men (Hibbard & Pope, 1986) and to engage in more health protective behaviours (Kandrack *et al.*, 1991). Women's high rate of referral may therefore be explained by their greater use of medical services, (e.g. Sayer & Britt, 1996, McCormick *et al.*, 1995). Obesity was also more likely to be found in the 35 to 64 age group, (as confirmed in Chapter 3) and this was the group where the referrals were more likely than expected to come from. This is consistent with the targeted age group for the ELC, since the risk of CHD rises after the age of 35. This age group was found to have the highest number of risk factors for CHD and was more likely than expected to participate in the intervention. These findings support the recent work by Harrison *et al.*, (2005) who found that women and those in the middle age group were most likely to be referred to an exercise referral scheme.

Inappropriate referrals were most likely to come from the over 65 age group, which suggests that they had a complex interaction of medical problems or that they had unstable medical conditions which made them unsuitable for the intervention. It also indicates problems with GP communication and the referral process. Communication problems may also have contributed to the 6% of individuals who attended the initial ELC assessment decided not to start activity. The GP may for example, have failed to explain what benefits could be gained from physical activity, or may not have discussed whether the individual felt capable and willing to participate in the intervention (this is discussed in more depth in Chapter 7). The over 65 age group may also have felt that they did not want to participate due to their age and perceptions of physical activity, for example that exercise was not applicable to them. In contrast, the lower than expected participation by under 35's may have been due to their belief that their health was not at risk, unrealistic optimism or due to work & childcare commitments. This is discussed in more depth in Chapter 8. These findings also support work by Harrison *et al.*, (2005) who found that people in the top and bottom age groups were least likely to attend an exercise referral scheme. In the current study, participants in the under 35 age group had fewer risk factors for

CHD, which is suggested to have contributed to their risk perceptions and reluctance to believe they needed to be physically active.

Whilst referrals were most likely to come from the areas with the highest standardised mortality rates (SMR), namely Wallasey and Birkenhead, those who chose to participate were more likely to come from the area with the lowest SMR, that is Bebington and West Wirral. The population resident in Bebington and West Wirral are more affluent, have better health and therefore GP's are likely to refer less people. In comparison, residents in Wallasey have poorer health, which increases their likelihood of referral. In addition, the ELC has a very convenient venue in Wallasey and this area also has a number of GP's who are particularly interested in CHD and are committed to the scheme and referring their patients into it. However, this interest in the scheme may account for why Wallasey GPs were most likely to make the majority of inappropriate referrals. This could indicate their belief that free access to physical activity should be provided for all individuals, regardless of their risk of CHD. That is they advocate prevention for all groups. It is suggested that people from Bebington and West Wirral were more likely to participate since they had access to transport, were retired and hence, it was convenient for them to attend during the ELC supervised time (9am-5pm). The age profile of the population in Bebington and West Wirral is also older than that of the other two areas and this would explain why participants from this area were more likely to have already suffered from CHD or a stroke. However, the area containing the participants with the highest number of risk factors was Birkenhead and this is the area from which the majority of participants would have been expected.

4.4.3 Adherence to physical activity

The 61% adherence rate found in the current study is higher than that suggested in the literature (Marcus *et al.*, 2000). It is indicative of the fact that the outcome measure was adherence to some form of activity, and that this may not necessarily have been part of the intervention. It also shows the difficulty encountered when measurement of the outcome is dependent on a combination of participant self-assessment and the subjective opinion of six different exercise advisers. Self reported measures of physical activity can be unreliable. In addition, the schemes emphasis on targets and preoccupation with obtaining high adherence rates may also

have meant that adherence could have been overstated. The findings one year after the intervention also highlight the difficulty of accurately measuring physical activity behaviour. At the end of the intervention, the exercise adviser discussed activity with the participants. The adviser then recorded this information on an evaluation form. In contrast to this, the assessment of activity at 12 months was carried out by the participant (i.e. a self-assessment) and recorded by them on an evaluation form. The self-reports by participants may have overestimated activity levels, which would explain why some were meeting recommendations at one year were not meeting them at 12 weeks. Alternatively, it is suggested that the advisers were focused on ascertaining if participants were still exercising after 12 weeks (i.e. a focus on adherence to the intervention), and as a consequence of this, a full discussion of all activity was not carried out. Therefore a full assessment of all activity was not captured at 12 weeks.

One important predictor of adherence to the intervention was self-rated health in general. However, whilst this predicted which participants would meet the recommended levels of physical activity at 12 weeks it did not predict those who would maintain them after one year. These findings highlight the limitations of the evaluation sample a year after the intervention. The response rate to the one year evaluation was representative of those individuals who completed the intervention in terms of gender and PCG area. However, the over 65 age group were more likely to respond to the 12 month evaluation, whereas the other two age groups were less likely to respond. In addition, those who were meeting physical activity recommendations at the end of the intervention were also more likely to respond than those who did not meet them. A positive improvement in self-rated health in general was also likely to predict which participants would increase their physical activity at 12 weeks. It is suggested that positive perceptions of an improvement in health act as an incentive to continue with physical activity.

At the beginning of the intervention, participants may have been reluctant to voice any barriers they had to taking part. This may have been because barriers were discussed and documented in conjunction with the exercise advisers. For example, those who were morbidly obese may have been more likely to drop out due to a belief that they were too over weight to exercise (HEA, 1992), yet felt unable to

discuss this with the adviser. Being over weight was also commented on one year after the intervention. It is suggested that these participants felt there was too much to be achieved, exercise was too hard for them (Dishman, 1982) and that their goals were beyond their reach. Indeed being overweight has been repeatedly documented to have a negative association with physical activity (e.g. Bauman *et al.*, 2002). However, it is also suggested that overweight/obese individuals in the current study may also have not been prepared to think long term and to have been looking for a quick fix to their problem (see Chapter 9 for a more detailed discussion on this). Stress, anxiety and depression was found to be a barrier to completion of the intervention. This was more likely to be found in the under 64 age group and is one factor that would explain why they were less likely to adhere to the intervention than the 65 and over age group. Lack of transport was the only barrier that significantly predicted drop out from the intervention. However, there was no significant difference between any of the demographic variables (deprivation score, gender, employment status or age group) and access to transport. One year after completing the intervention, women were more likely to mention lack of time as a barrier to activity, caused by conflicts in their role responsibilities (Kandrack *et al.*, 1991). They may have made time for the duration of the intervention but been unable to maintain this commitment. This is explored in the interviews (see Part Three). However, if time was a barrier for men, they may not have taken the time to respond to the questionnaire and therefore, this data may not be an accurate representation of the true picture.

For some participants, failure to continue activity beyond the intervention may have been due to fear of injury. Indeed, studies have found that injury is a real concern for individuals (e.g. Conn *et al.*, 2003; Marshall & Guskiewicz, 2003; King, 2001) and that injury is the most common reason for relapse from exercise (e.g. Eden *et al.*, 2002; Sallis *et al.*, 1990; Verbunt *et al.*, 2005). Once the support of the expert exercise adviser was no longer available, participants may not have felt confident to exercise safely on their own. This is one explanation for the low numbers of participants who continued to use the leisure centres after the intervention. There is evidence to support fear of injury in their comments after 12 months and this is also a theme that is explored in the qualitative interviews (see Part Three). Specialist supervision would therefore appear to be a very important factor in giving sedentary

individuals the confidence to undertake activity without causing themselves injury, pain or deterioration. Indeed, studies have found that injury is rare when physical activity is supervised (e.g. Buchner & Coleman, 1994; Timpka, 2005). However, until guidelines are developed that set out which activities presents the greatest health benefit, whilst at the same time minimising the risk of injury, this issue will remain a concern for many people (Marshall & Guskiewicz, 2003).

Enjoyment was one key theme that emerged from the evaluation one year after the intervention. This has been consistently identified as a reason for participation in physical activity (e.g. HEA, 1992), whereas lack of enjoyment has been identified as a barrier to participation (e.g. Clarke & Eves, 1997). Whilst this was a factor that contributed towards completion of the intervention it did not appear to be sufficient incentive to continue activity beyond the intervention. It is suggested that this indicates a focus on the duration of the intervention and that participants were not prepared to take responsibility for their own physical activity beyond this time frame, nor were they sufficiently motivated to continue activity, despite believing they had gained health benefits from it. However, the effect of enjoyment on physical activity one year after completion of the programme may have been confounded by the age profile of the participants who responded to the one year follow up. In particular, Garcia and King (1991) did not find that enjoyment contributed to exercise adherence in older, sedentary adults, whereas others have found that it is important in maintaining exercise participation in younger age groups (Dishman, Sallis & Orenstein, 1985).

Some participants discontinued physical activity when they did not obtain the outcome they wanted within their timescale, or when they found out that physical activity would not help them achieve their desired outcome. The evaluation suggested that physical activity had to be something that participants believed would provide them with their desired outcomes, within their perceived time frames, without causing them harm, in a format that was both enjoyable and convenient to them. In addition, there is evidence that they did not want to feel coerced into something they felt uncomfortable with. A useful framework for helping to explain this behaviour is reactance theory (Brehm, 1966). In particular, participants may see their referral to the ELC as a threat to their freedom, react against the referral and fail

to participate. However, if the pressure from their GP to comply is greater than their level of reactance, they may participate in the ELC, complete the twelve weeks and then re-establish their freedom to be sedentary by failing to maintain their activity. In addition, they may also suffer reactance due to coercion from the exercise advisor, which directs them to a type of activity they do not feel comfortable with. Another possible explanation for participant's failure to continue physical activity beyond the end of the ELC is that they may have viewed the programme as a 'prescription' from their GP, to be taken only for 12 weeks. This is discussed in depth in the qualitative chapters (Part Three).

The comments from participants one year after completing the intervention show how easy it is to revert back to old habits once an intervention is over. They also confirm evidence from the literature that shows primary care based interventions are only successful in changing behaviour in the short term (Riddoch *et al.*, 1998). In addition, formal programmes can foster dependence on 'treatment' cues (such as attending structured sessions) and support (Orleans, 2000). Community based interventions such as the Exercise and Lifestyle Centres create an environment that reinforces desired behaviour. However, when people are left on their own, they are then at the mercy of a social system that encourages, rewards and profits from at risk behaviours, for example by selling high fat foods and promoting sedentary leisure activities (Strum, 2004). This is also a system in which normal forms of physical activity has been engineered out hence, it is not surprising that most successful individuals revert to their old behaviour within 6 to 12 months. The comments also show that some participants believe it is the responsibility of the NHS to provide resources for physical activity. They also highlight how individuals prioritise resources and choose not to spend their time and money on physical activity (Cawley, 2004).

4.5 Summary

The findings from the evaluation confirmed that attempting to change physical activity habits, via a restricted individual-centred intervention (such as the ELC), produces limited outcomes. This is in line with the evidence from existing studies. These show that exercise referral schemes result in small improvements in physical activity patterns in the short term (Riddoch *et al.*, 1998) and also that they are not

necessarily effective in increasing physical activity in the longer term (Webborn, 1996). The ELC was successful in changing the levels of physical activity in 39% of the individuals who were originally referred to it. It also enabled 22% of these individuals to meet the recommended levels of physical activity required to produce health benefits. However, one year after the end of the intervention, the numbers still meeting the recommendations had fallen to 5%.

It is important that costly interventions such as the ELC appeal to those individuals who will gain the most benefit from them. It is also imperative that participants maintain an increase in physical activity for the duration of the intervention and also beyond. The findings from the evaluation suggest that the referral process needs improving in order to ensure that those individuals who need the intervention most are facilitated to take part (see recommendations, Chapter 11). They indicate that those who successfully complete the intervention are not necessarily those who need to change their physical activity behaviour the most. The evaluation highlighted a number of reasons why participant may fail to adhere to the intervention. It shows how physical activity is a complex behaviour that is affected by an interaction of many different variables. The subsequent chapters aim to expand upon these findings and to both explore and gain a better understanding of physical activity behaviour in those individuals who are at risk of CHD.

Chapter 5

Wallston's Modified Social Learning Theory

5.1 Introduction

The Government's plan for the new NHS (DoH, 2000) emphasises prevention and helping people to maintain their own health. It highlights the current trend for people being encouraged to take responsibility for their health through the adoption of healthy behaviours. It is not surprising, therefore, that one of the most widely researched constructs with respect to the prediction of health behaviour is health locus of control (HLC) (Wallston *et al.*, 1976). The assumption underpinning this construct is that an individual will be more likely to engage in behaviours which promote their health and avoid those that compromise health if they believe they have control over their health behaviour (Wallston & Wallston, 1981; Strickland, 1978). It has been suggested that HLC may provide health care and public health professionals with one way of understanding what populations will respond to preventive health messages and the way they will respond (Bell *et al.*, 2002). In particular, an understanding of an individual's HLC orientation may enable a prevention programme to be tailored to individual needs and therefore support the achievement of programme goals. HLC has, for example, been found to vary by gender, with women generally being more external than men (Sherman, 1997), age and health condition, with lower levels of self-mastery being associated with advancing age and healthy adults reporting higher internal beliefs (e.g. Marshall, 1991; Wallston & Smith, 1994; Frazier, 2002). A number of UK studies have provided support for using the HLC construct to examine exercise behaviour (e.g. Norman *et al.*, 1997; 1998; Bennett *et al.*, 1994).

In 1978, Wallston *et al.* developed the Multidimensional Health Locus of Control (MHLC) scale. The MHLC is a construct designed to categorise individuals according to their orientation for managing their health. It measures locus of control beliefs along three dimensions (internal, powerful others and chance). The three dimensions are the belief that health is the result of an individual's own actions (Internal HLC (IHLC)), the result of powerful others (Powerful others HLC (PHLC)) or of fate or chance (Chance HLC (CHLC)). In their review of HLC, Wallston and Wallston (1982) found that one of the most pervasive findings from studies that had

used the MHLC scales was that PHLC scores were generally less predictive of preventive behaviours in healthy individuals than either IHLC or CHLC scores. However, PHLC was found to be predictive of medical compliance in those with chronic disease. In their review of HLC, Norman and Bennett (1996) point out that most of the research on HLC has focused on the relationship between internal beliefs and the performance of health behaviour. They noted that powerful others beliefs have rarely been found to predict health behaviour in healthy populations and that these beliefs may therefore be more relevant to illness behaviour. However, Steptoe and Wardle (2001) have demonstrated that students with high powerful others HLC are less likely to exercise than those with high internal HLC.

Rotter's (1954) social learning theory suggests that locus of control is domain specific and that behaviour is more appropriately predicted by measures that ascertain the locus of control orientation for the relevant behaviour domain (e.g. physical activity). However, this will only be the case if a person has experience of a given situation. Wallston & Wallston (1981) have also suggested that a generalised HLC scale may be important in determining behaviour in relatively novel situations where the individual has little prior knowledge of the behaviour, the outcome is unknown and the possibility of control is not obvious. In these situations individuals will rely on general knowledge and beliefs. However, Lefcourt (1991) found that behaviour specific HLC scales have generally produced more positive results when attempting to predict behaviour. However, he does agree with Wallston that situation specific expectancies will only be more predictive than generalised measures when people have some prior knowledge and experience in the situation. A study that investigated the utility of an exercise specific locus of control scale in predicting activity behaviour was that conducted with a sample of university fitness programme members (Burk & Kimiecik, 1994). This sample would already have prior knowledge and experience of activity therefore, a specific scale would be expected to be more predictive of exercise behaviour (Wallston & Wallston, 1981; Lefcourt, 1991). However, Burk and Kimiecik (1994) concluded that their findings provided only modest support for the hypothesis that more specific expectancies (e.g. relating to exercise) should be better predictors of exercise behaviour than more generalised ones such as health. This finding would suggest that even in a population that has knowledge and experience of physical activity, a specific scale

might not have a greater predictive utility than a general one such as the MHLC. It also supports the utility of using a general scale with a population that is predominantly sedentary with little experience or knowledge of physical activity.

In their review of HLC, Norman and Bennett (1996) found that research on the relationship between HLC beliefs and physical activity participation has produced inconclusive results. They suggest that this may have been due to the omission of health value. Indeed, social learning theory (Rotter, 1966) suggests that behaviour is a function of both expectancy beliefs (e.g. HLC) and the value attached to certain outcomes (e.g. health value). The most popular measure of health value was developed by Lau *et al.* (1986). A number of studies have shown that health value generally moderates HLC (e.g. Weiss & Larsen, 1990; Steptoe & Wardle, 2001) and some have found evidence the health value specifically moderates the relationship between HLC and exercise behaviour (e.g. Norman *et al.*, 1998); although some have not (e.g. Norman *et al.*, 1997). Support for examining physical activity behaviour using a general MHLC scale (Wallston *et al.*, 1978) along with a measure of health value (Lau *et al.*, 1986) has been found by Norman *et al.*, 1998. This study used data from the 'Heartbeat Wales' survey, a shortened version of the MHLC scale and analysed data according to Wallston's 8 HLC typology (Wallston & Wallston, 1981). This typology (see Table 5.1) resulted from the Wallston's suggestion that, when data from the MHLC scale is analysed, it may not be appropriate to consider each of the HLC dimensions in isolation. They proposed that the usefulness of HLC as a predictor of behaviour could be improved, by considering it as a multidimensional concept. In addition, when predicting health behaviour, it is the combinations of beliefs that may be the most important. Wallston and Wallston (1981; 1982) have argued that in some situations, it may be an advantage to have a particular mix of HLC beliefs. They suggested that one combination of beliefs that may be particularly useful for supporting change in health behaviour, when individuals have been advised to change by a health professional, is a belief in the role of powerful others and strong internal HLC beliefs. In addition, having strong powerful others HLC may mean an individual is receptive to the health message and when this is combined with internal HLC beliefs, the advice is translated in to behaviour change. Wallston (1989) also suggested that having a strong belief in the

role of powerful others may be an advantage particularly during acute or chronic illness.

Table 5.1

Wallston's eight Health Locus of Control types

Type	Internal	Powerful Others	Chance
Pure Internals	High	Low	Low
Pure Powerful Others External	Low	High	Low
Pure Chance Externals	Low	Low	High
Double External	Low	High	High
Believers in Control	High	High	Low
Type 6	High	Low	High
Yea Sayers	High	High	High
Nay Sayers	Low	Low	Low

Analysis of MHLC data according to Wallston's typology has been used in a number of studies (e.g. Norman *et al.*, 1998; Waller & Bates, 1992). In a representative sample of Welsh adults (n=11,632) aged under 65, the most common HLC type was pure chance externals (17%), followed by pure internals (15%), (Norman *et al.*, 1998). However, in a small sample of healthy elderly (n=57), 50% were found to be pure internals (Waller & Bates, 1992). The study by Norman *et al.* (1998) provided support for using a shortened version of Wallston's MHLC scale (Wallston *et al.*, 1978), a measure of health value (Lau *et al.*, 1986) and adopting Wallston & Wallston's (1981) typology to analyse MHLC data.

In 1992, Wallston published a critical review of HLC. He suggested that even if an individual believes their health status is controlled by their own behaviour, they will be unlikely to engage in a health behaviour unless they are motivated by health and believe they are capable of carrying out the behaviour. This led Wallston to propose a modified social learning theory which includes measures of health value and perceived control (Wallston, 1992). In an earlier study he had suggested that perceived control consists of locus of control (which addresses control over outcomes) and also self-efficacy (which is concerned with control of behaviour) (Wallston *et al.*, 1987). He found that where there is both an internal locus of control and a high health value, health behaviour is largely influenced by perceptions

of control over behaviour (i.e. by self-efficacy). He also suggested that self-efficacy is highly behaviour and situation specific and therefore, perceiving control over behaviour in a certain situation does not necessarily generalise to other behaviour or situations. A more recent review found that perceived control over outcomes moderates the relationship between self-efficacy beliefs (i.e. perceived control over behaviour) and outcomes (Wallston, 1997).

Wallston's modified social learning theory has not been tested in a primary care exercise referral scheme context. However, a number of recent studies have explored perceived control and exercise behaviour (e.g. Armitage, 2003; Norman *et al.*, 2000). Norman *et al.* (2000) suggested that the less often a behaviour was performed by an individual, the less realistic their perceptions of control over it were. Perceived behavioural control was found to predict exercise behaviour at high and moderate levels of past behaviour but not at low levels of past behaviour. This would suggest that self-efficacy may not predict physical activity behaviour in sedentary people, who have done no physical activity or only low levels of physical activity in the past. Armitage (2003) also suggested that people are poor judges of their personal level of control, although people with an IHLC are more accurate in their judgements of proximal control. He suggested perceived behavioural control might be based on disposition, since it was predicted by IHLC.

The current study hypothesised that MHLC may be a useful conceptual tool for understanding physical activity behaviour in adults referred to a primary care exercise referral scheme (the Exercise and Lifestyle Centres). It is suggested that an understanding of HLC beliefs may provide some guidance on the type of behaviour modification programme that is most suitable for those at risk of coronary heart disease. The study also explores Wallston's modified social learning theory and incorporates measures of health value and perceived control (Wallston, 1992). It aims to investigate whether Wallston's theory may be helpful in predicting participation in a primary care based exercise referral scheme and, therefore, participation in physical activity.

5.2 Method

5.2.1 The sample

The sample used for the study in this chapter is the same as that used in stage three of the Exercise and Lifestyle Centres study (Chapter 4). This consisted of two hundred and forty individuals who participated in the Exercise and Lifestyle intervention between 1st October 2001 and 31st January 2002.

5.2.2 The questionnaires

At the start of the intervention, individuals who decided to participate met with one of the exercise advisers and two questionnaires were completed (Appendix 4 and 7). The adviser completed the majority of the first questionnaire (Part 1) based on responses from the participant and the participant completed the final two questions relating to self-assessment of health and self-efficacy. The participant also completed the second questionnaire (Part 2). Table 4.1 (Chapter 4) contains details of some of the variables and their coding. However, the variables that were of particular interest to the study in this chapter are shown in Table 5.2. These were self-efficacy, health locus of control and health value (variables from Wallston's Modified Social Learning Theory). In addition, this chapter explores those variables that were identified in the structural equation model (Chapter 3) as being significantly associated with physical activity behaviour, namely gender, age, employment status and self-rated health in general.

Table 5.2

Variables collected at the start of the intervention.

Variable	Code
Gender	Male = 1, female = 2
Employment status	Working full time = 1, working part time = 2, unemployed and looking for a job or never had a paid job = 3, unable to work due to illness or disability = 5, retired = 6, student = 7 and housework, not looking for paid employment = 8
Age	Continuous
Age group	Categorical, under 35 = 1, 35 – 64 = 2, 65 + = 3
Self-rated health in general at the start of the programme	5 categories. Excellent = 1, very good = 2, good = 3, fair = 4, bad = 5.
Health Value	4 questions from Lau <i>et al.</i> , (1976) health value scale. Coded on a six point likert scale (strongly agree = 6 to strongly disagree = 1) with questions 2 & 3 reverse coded.
Internal health locus of control (IHLC)	3 questions from Wallston's MHLC (as used by Bennett <i>et al.</i> , 1994). Coded on a six point likert scale (strongly agree = 6 to strongly disagree = 1). <i>One of these measured self-mastery.</i>
Powerful others health locus of control (PHLC)	3 questions from Wallston's MHLC (as used by Bennett <i>et al.</i> , 1994). Coded on a six point likert scale (strongly agree = 6 to strongly disagree = 1).
Chance health locus of control (CHLC)	3 questions from Wallston's MHLC (as used by Bennett <i>et al.</i> , 1994). Coded on a six point likert scale (strongly agree = 6 to strongly disagree = 1).
Self-efficacy	One question measured on a continuous rating scale from not very = 1 to extremely = 10.

This study included nine questions on HLC. These were from the shortened version (Form A) of the MHLC scale as used in the 'Heartbeat Wales' survey (Bennett *et al.*, 1994; Norman *et al.*, 1998). In addition, it used four questions to measure health value (Lau *et al.*, 1986). The self-efficacy measure was one that had previously been used in the intervention that preceded the Exercise and Lifestyle Programme (called Exercise on Prescription). It was decided to retain this simple and fairly general measure of self-efficacy for this study. This decision was made on the basis that individuals had no prior knowledge of the physical activity in which they were due to take part, and also that they possessed a wide range of mental and physical limitations. As part of the intervention they would also have participated in a wide range of activities. These would have been differentially affected by obstacles such as pain (e.g. a participant may still have been able to continue walking and chair exercises, yet have not been able to attend any fitness suite activities). Therefore, a specific and detailed physical activity self-efficacy measure would not have added

anything to the prediction of behaviour in this study. Individuals had also separately stated any concerns and barriers they perceived would have an impact on them carrying out their behavioural intentions (see Chapter 4). The question used to measure self-efficacy, on a continuous rating scale, ranging from not very (0) to extremely (10) was ‘Do you feel physically able enough to try new activities, e.g. swimming, walking, exercise class?’

A final questionnaire was completed by the adviser at the end of the twelve week intervention, based on participant responses. The key data of interest to this part of the study is shown in Table 5.3 however, the questionnaire also collected additional outcome data and reasons for dropping out of the programme from participants (see Chapter 4).

Table 5.3

Data collected at the end of the intervention

Variable	Code
Completed the intervention	Yes = 1, no = 2
Meeting physical activity recommendations at end of intervention.	Yes = 1, no = 2
Self-rated health in general at the end of the programme.	(5 categories, excellent = 1, very good = 2, good = 3, fair = 4, bad = 5).

5.2.3 Analysis of data

Data collected by the advisers from the participants had already been coded and entered in to SPSS (see Chapter 4). The data from Wallston’s MSLT questionnaire was put into an excel spreadsheet to facilitate calculation of the score on each of the variables. The data was then added to the SPSS file.

Each question was scored according to the coding scheme (Table 5.2). The scores from the four health value questions were summed to give a total score ranging from 4 through to 24. In order to enable the data to be acceptable in a chi square analysis, the scores were divided on a median split. Low health value was classed as scores from 4 to 14 (coded 0) and high health value was scores from 15 to 24 (coded as 1). Both the total health value scores and the classification into low or high health value were entered as separate variables in the SPSS data file. A similar process was

carried out for the three HLC dimensions. For each of the nine MHLC questions, the potential scores ranged from 1 through to 6. A total score for each of the three dimensions was calculated, ranging from 3 through to 18. The scores for each of the three dimensions were divided on a median split. A high HLC was classed as scores from 11 to 18 (coded as 1) and a low HLC was classed as scores from 3 to 10 (coded 2). Both the total scores for each of the three HLC dimensions and their classification into low or high HLC were entered as separate variables in the SPSS data file. The high and low codes from each of the three dimensions were used to classify participants into one of the eight HLC types according to Wallston's typology. The types were coded 1 to 8 and entered as a variable in the SPSS file. The measure of self-efficacy was entered into the SPSS file as a total score and a variable for high or low self-efficacy was added as a separate variable, based on a median split. Low self-efficacy was classed as scores from 1 to 5 (coded 0) and high self-efficacy was classed as scores from 6 to 10 (coded as 1)

There were two stages to the data analysis. Firstly, a chi square analysis was carried out on the four variables (gender, age, employment status and self-rated health in general) identified in Chapter 3 as being significantly associated with physical activity behaviour. This was done in order to determine whether there was a significant association between any of these four variables and the variables from Wallston's MSLT. Using the analyse, descriptive statistics, cross tabs and chi square statistic in SPSS, each of the four variables was selected in turn and tested for significance against each of the MSLT variables. Then a chi square analysis was carried out on each of the variables collected at the start of the programme to see if there was any significant difference between the variable and whether participants completed the intervention or not. For example, age was entered as the start variable and completed the intervention as the outcome variable, the chi square analysis was run and the result recorded. Then gender was entered as the start variable, with completed the intervention as the outcome variable etc. (see 5.3.3). The second stage in the data analysis was designed to identify which of the variables would predict adherence or drop out from the intervention, a chi square test was carried out. Each of the variables was taken in turn and the test was run with the outcome at 12 weeks as the dependent variable (i.e. complete or drop out). The significant findings are shown in table 5.6.

5.3 Results

5.3.1 Introduction

The findings have been divided in to three sections. The first provides descriptive statistics and gives a general picture of the participants (5.3.2). The second section presents the significant relationships between the variables (5.3.3) and the final results section shows which variables were found to be significant predictors of completion of the intervention (5.3.4).

5.3.2 Characteristics of participants

The age of the two hundred and forty participants ranged from sixteen through to seventy-nine (mean = 50.37) (Table 5.4). They were most likely to rate their health as good with little variation above or below this (i.e. either very good or fair). Whilst the full range of fifteen scores for PHLC and CHLC were used by participants, only the highest twelve scores were used on the IHLC scale. Participants were more likely to have a high internal locus of control (mean = 14.54) and to score lower on PHLC (mean = 10.13) and lowest on CHLC (mean = 8.61). In addition to having a high internal locus of control, participants generally had high levels of self-efficacy (mean = 7.42) and self-mastery (mean = 5.0).

Table 5.4

Description of participants

Variable	Range	Min - Max	Mean	Std. Deviation	Variance
Age	63	16 to 79	50.37	13.79	190.11
Health rating at end	3	2 to 5	3.17	0.88	0.770
IHLC score	12	6 to 18	14.54	2.49	6.22
PHLC score	15	3 to 18	10.13	3.61	13.03
CHLC score	15	3 to 18	8.61	2.86	8.17
Health Value score	16	8 to 24	18.70	3.22	10.33
Self-efficacy	10	0 to 10	7.42	1.82	3.30
Self-mastery	4	2 to 6	5.00	0.86	0.732

The participants consisted of 30% men and 70% women. One third of participants were working (19% full time and 14% part time) and two thirds were not in paid

employment (32% retired, 15% long term sick, 12% housework and 8% unemployed).

When the health locus of control orientation of participants was considered on an internal – external split, almost all were internals (Table 5.5). However, the use of Wallston's MHLC typology (Wallston & Wallston, 1981) found that just over half were pure internals, with a further twenty two percent being believers in control (that is having a high internal and powerful others external orientation combined with low chance).

Table 5.5

Participant's health locus of control types

HLC Type	Frequency	Percent
Internal	231	96.3
External	9	3.8
	240	100.0
1 Pure Internals (HLL)	130	54.2
2 Pure Powerful Others External (LHL)	3	1.3
3 Pure Chance Externals (LLH)	1	.4
4 Double External (LHH)	2	.8
5 Believers in Control (HHL)	53	22.1
6 Type 6 (HLH)	17	7.1
7 Yea Sayers (HHH)	19	7.9
8 Nay Sayers (LLL)	15	6.3
	240	100.0

5.3.3 Relationships between variables

Age group was found to have a significant relationship with PHLC ($\chi^2 = 6.92$, $df = 1$, $p = 0.031$), health value ($\chi^2 = 12.22$, $df = 2$, $p = 0.002$) and HLC type ($\chi^2 = 20.16$, $df = 8$, $p = 0.010$). In addition, PHLC was significantly related to gender ($\chi^2 = 5.92$, $df = 1$, $p = 0.015$).

Men were found to be significantly more likely than women to have high external, powerful others, locus of control beliefs (PHLC). Those in the over 65 age group were also more likely than expected to have a high PHLC. However, this age group

rated their health value as expected. In contrast, the under 35 age group were likely to rate their health value as lower than expected and the 35 to 64 age group were likely to rate is as higher than expected. The 35 to 64 age group were significantly more likely than expected to be pure internals and less likely to be believers in control. However, the over 65 age group were less likely to be pure internals and more likely to be believers in control or type six (high internal, high chance). The under 35 age group were also more likely to be type six.

5.3.4 Adherence to the intervention

Adherence to the intervention was significantly predicted by self-rating of health in general, employment status, age, HLC type and PHLC (Table 5.6). Whilst those with a combination of high IHLC, high health value and high self-efficacy were more likely than expected to complete the intervention, this finding was not significant.

Table 5.6

Variables predicting completion of the intervention

	χ^2	df	<i>p</i> =
Health in general (end)	41.62	3	0.001
Employment status	18.26	5	0.003
HLC Type	11.74	4	0.019
Health in general (start)	11.07	3	0.011
Powerful others HLC	7.03	1	0.006
Age group	6.87	2	0.032

Those participants who dropped out of the programme before the end were significantly more likely than expected to rate their health as less than good. In contrast, those who rated their health as good or very good were significantly more likely to complete it. Self-assessment of health in general is discussed in Chapters 3 and 4.

Individuals who were retired were significantly more likely than the other employment groups to complete the programme, with 79% of them continuing to engage in physical activity at the end of twelve weeks. In addition, those

participants aged over 65 were significantly more likely to complete the programme than the other age groups.

Participants who held high powerful others health locus of control (PHLC) beliefs when they started the programme were significantly more likely to complete the intervention than those with low PHLC beliefs. In addition, when health locus of control was viewed as eight types (Table 5.1), it was those who were believers in control who were significantly more likely than the other types to complete the programme (i.e. those who had high internal, high powerful others and low chance beliefs).

5.3.5 Summary

The findings from the descriptive statistics showed that those holding high internal locus of control beliefs were most likely to participate in the intervention. According to Wallston's typology, they were mainly pure internals or believers in control (with a combination of high internal, high powerful others and low chance HLC beliefs). In general, all participants scored highly on the measures of health value and self-efficacy.

Chi square analysis of the data showed that there were a number of significant relationships between variables. Age was found to be significantly related to PHLC and HLC type, with those in the over 65 age group being more likely to have a high PHLC and to be believers in control (with a combination of high internal and powerful others beliefs and low chance). However, the over 65 age group rated their health value in line with expectations when compared to the under 35s where it was significantly lower and the thirty five to sixty four age group where it was significantly higher than expected. A significant relationship was found between the PHLC dimension of the MHLC scale and gender, with men having a higher PHLC orientation than women. There were no other significant relationships between variables, for example self-rating of health in general was not significantly associated with the IHLC dimension of HLC, or with self-mastery or HLC type. In addition, none of the variables were found to be significantly associated with meeting the recommended levels of physical activity.

The chi square analysis found that five variables were significantly more likely than expected to predict adherence to the intervention. Three of them (age, employment status and self-rating of health in general) have already been discussed in Chapter 4. This showed that the participants most likely to complete the intervention were those aged over 65, retired and rating their health in general as good or better than good. The other two variables found to predict completion of the intervention were a PHLC orientation and a 'believers in control' HLC type (high IHLC, high PHLC low CHLC). None of the variables were found to predict continued use of the leisure centre activities three months after completion of the intervention (Chapter 4. 4.3.5).

5.4 Discussion

5.4.1 Introduction

The discussion is organised in to four sections. The findings that relate specifically to HLC and MHLC are discussed in section 5.4.2. This section confirms that HLC beliefs contribute to participation in the ELC and to performance of physical activity/health behaviour. In addition, MHLC helps to identify which groups are more likely to participate in the ELC. The second section focuses on Wallston's modified social learning theory (MSLT) and the combination of HLC, health value and self-efficacy. In particular, whether MSLT is useful for identifying who will participate in the ELC and in helping to understand physical activity behaviour (Section 5.4.3). The limitations of the study are then discussed, in terms of the measures and the data collection methods used (Section 5.4.4). The discussion concludes with a summary (Section 5.4.5).

5.4.2 HLC as a tool for understanding physical activity behaviour

The findings confirm the assumption underlying HLC, that is, individuals are more likely to engage in health promoting behaviours if they believe they have control over their health (Wallston & Wallston, 1981). The finding that men were likely to be more externally orientated than women contradicts the findings from a review of HLC and gender (Sherman, 1997). However, the fact that men along with the over 65 age group were found to have a greater incidence of coronary disease (see Chapter 4) may explain the gender and age differences in HLC orientation. In particular the over 65s and men's higher PHLC beliefs are suggested to have been due to illness behaviour (Norman & Bennett, 1996) and to them being less healthy

than the other groups. Indeed, level of illness has been found to influence HLC beliefs and for those with chronic illness to be more externally orientated (e.g. Marshall, 1991; Frazier, 2002).

The findings support Wallston and Wallston's (1981; 1982) suggestion that a belief in the role of powerful others, combined with strong internal beliefs are particularly important in supporting behaviour change in individuals who have been advised to change by a health professional. In the current study, a belief that powerful others control health is suggested to have supported participants' decisions to follow advice with respect to health promoting behaviour. A powerful others orientation did not appear to be a belief that doctors would be able to cure any disease, and, therefore to condone lack of self-responsibility and sedentary behaviour.

5.4.3 Wallston's MSLT as a tool for predicting physical activity

Although many participants had been provided with little information from their GP (see Chapter 7), they knew that the scheme was essentially about physical activity. It is suggested, therefore, that the fact that they made an appointment with the ELC indicated that they already had a reasonable level of self efficacy and felt capable of undertaking some form of physical activity. This may also explain why the majority of participants rated their self-efficacy highly. However, the high ratings might also be due to participants' unrealistic expectations of control over their behaviour and their poor judgement of their personal level of control (as advocated by Armitage, 2003; Norman *et al.*, 2000). These unrealistic expectations and poor judgements are suggested to have resulted from low levels of physical activity in the past and therefore, self-efficacy would not be expected to predict physical activity behaviour in the current study.

When a health specific locus of control scale is used, the assumption is that health is the primary reinforcement for physical activity, however this may not be the case (see limitations Section 5.4.5). This may provide one explanation why, when HLC was considered in conjunction with health value, it did not provide a prediction of health behaviour. However, those entering the intervention generally rated their health value highly and it is suggested that this provided an incentive to initiate activity on the intervention. Social Learning Theory (Bandura, 1977b) may also provide part of the explanation as to why dimensions of HLC and the value that

participants attached to their health were not found to be particularly relevant to physical activity behaviour in this study. Firstly this may be because the factors that determine health behaviour in the immediate and shorter-term are the most powerful ones. In contrast, the longer-term health outcomes from physical activity are both distant in time and problematic to achieve. This is something that is discussed in more detail in Chapter 9. Lau's health value scale (Lau *et al.*, 1986) may also fail to capture the value which individuals place on short term health gains, since it focuses on longer-term global health. In addition, the locus of control model makes the assumption that it is cognitive processes that mediate behaviour. Whilst this may be true for behaviours that are not continuous, such as attendance at health screening, it might not be the case for repeatable behaviours that are habitual, such as physical activity. Although health value did not predict completion of the ELC, the significant differences in health value between the three age groups may suggest that age is confounding the relationship between health value and outcome of participation on the ELC.

5.4.4 Limitations of the study

One limitation of the study may be the use of a general MHLC scale. A general scale was selected because participants were being introduced to novel exercises that they would not have met before, in a situation that they had never entered before e.g. fitness suite environment. It is difficult to know whether participants in this study relied on general knowledge & beliefs about physical activity. Beliefs about the benefits of physical activity and concerns about injury are explored in (Chapter 8). If participants did rely on general knowledge and beliefs about physical activity a specific scale may not have provided a better prediction of activity. The use of a shortened version of the MHLC scale in this study may also have had an impact on the findings. Indeed, Norman *et al.* (1997) have suggested the scale only has modest internal reliability. However, use of this shortened scale has been widely used in studies reporting findings from analysis of data from the 'Heartbeat Wales' survey (Bennett *et al.*, 1994; Norman *et al.*, 1998). In addition, the internal reliability is within an acceptable range according to Lefcourt (1991). It would also have been impractical to use the full version of the MHLC in the current study due to space constraints in the questionnaire and the time pressures at the point of data collection.

It is, therefore, acknowledged that the findings from this study may have been limited by the selection of a shortened version of the MHLC as a measure.

It is acknowledged that the measure of self-efficacy may have lacked the level of sophistication and detail which was required to predict physical activity behaviour. However, due to space constraints in the questionnaire and the need to keep it short, it was not feasible to use a more detailed measure in this study. The validity of the self-efficacy questions may also have been distorted by the fact that participants completed the questions in a meeting with one of the scheme's advisors. Some individuals may have felt that any negative response would lead to them being refused access to the scheme. The findings will also have been influenced by the use of Lau *et al.* (1986) health value scale, since it does not allow health to be compared with other variables that may also be of importance to individuals.

Another limitation involves the use of a self-report measure for physical activity, which may not accurately reflect actual patterns of exercise. The difficulty involved in accurately measuring physical activity has already been discussed in Chapter 3. This measure would, for example, have affected whether participants were classified as sedentary, with little knowledge about the personal outcomes of physical activity. However, even sedentary participants would probably have taken part in some form of physical activity in the past & therefore have had some general knowledge about physical activity. This study may therefore have found better predictions between HLC and physical activity behaviour if it had used a physical activity specific measure of HLC based on the assumption that people may hold different control beliefs for different behaviours.

5.4.5 Summary

This study found some evidence to support the utility for using Wallston's MHLC in order to understand physical activity behaviour in the target group (i.e. those referred by their GP as being at risk of coronary heart disease). However, it is suggested that in order for individuals to commence an intervention such as the exercise and lifestyle programme, they are likely to already hold high IHLC beliefs, place a high value on their health and believe they are capable of taking part in some form of physical activity. The internal beliefs may be either pure internal beliefs or combined with a strong belief in powerful others. Without a combination of these

beliefs, it is suggested that individuals may ignore their GP's advice to take part in physical activity. Evidence for this is the high health value and self-efficacy scores of participants when they entered the intervention, along with the large numbers holding IHLC beliefs or being believers in control. Therefore, the study provides some support for Wallston's MSLT which proposes that individuals will only engage in health behaviour when they are motivated by health, believe they are capable of carrying out the behaviour and that they have some control over their own health status. Whilst Wallston's MSLT indicated a tendency to initiate participation in the intervention, it did not predict adherence, or meeting physical activity recommendations at the end of the intervention.

The findings indicate the complexity of the interaction between a number of variables and physical activity behaviour. In the structural equation model, for example, age was found to have an indirect effect on physical activity behaviour via its moderating effect on self-rated health in general (Chapter 3). The current chapter has shown that the indirect effect of age on physical activity behaviour is itself moderated by beliefs such as HLC.

Wallston and Wallston summed up their 1981 review of HLC by saying that:

"one thing is exceedingly clear: Human behaviour is complex and multidetermined. It is simplistic to believe that HLC beliefs will ever predict very much of the variance in health behaviour by itself. The HLC scales are not the magic panacea many people believe they are" (p. 236).

The remainder of this study, therefore, adopts a qualitative methodology in order to take the analysis of physical activity behaviour a stage further. It seeks to explore and gain a better understanding of the factors that have an impact on the behaviour of the individuals who were referred into the Exercise and Lifestyle Centres programme.

Part Three

Qualitative Study

Chapter 6

Qualitative Methodology

6.1 Introduction

Qualitative methodology is useful since it addresses the issue of “human individuality which is lost in the averaging of statistical manipulations of data” (Smith, 2001, p.3). It enables the experiences of individuals to be explored and provides insights into health behaviour (Yardley, 2000). Qualitative methods seek to make sense of phenomena in terms of the meanings people bring to them and explore the complexities of human behaviour (Greenhalgh & Taylor, 1997). The strength of these methods lies in producing findings that are close to the truth (i.e. validity) (Greenhalgh & Taylor, 1997). Qualitative methods have been found to be useful for generating significant knowledge about physical activity and ageing (e.g. Markula, Grant & Denison, 2001). They have also been used to study participants in exercise referral schemes. For example, Crone, Smith and Gough (2005) adopted grounded theory (as per Strauss & Corbin, 1998) to understand the effect of participation in an exercise referral scheme on mental health. They aimed to examine participants’ perceptions and experiences of the social world, to present participants’ points of view and their understanding and meaning of the experience (and within the text, to present their feelings, actions and thoughts). They used grounded theory to develop a conceptual framework to help explain the physical activity and mental health relationship. A qualitative study by Hardcastle and Taylor (2005) adopted an interpretivist approach to explore exercise identity in older women. In addition, Charmaz (1990) has used grounded theory methodology to explore chronic illness. Pope, Ziebland and Mays (2000) point out that qualitative research developed for use in an applied study often has the objective of the investigation set out in advance. They note that objectives are shaped by the information requirements of the funding body, and refer to this as a framework approach. In addition they note that whilst this approach starts deductively (from the aims and objectives already set for the study) it is heavily based in original accounts and observations of the people who are studied (i.e. it is grounded and inductive). In their view, the time scales of applied research tend to be short and there is a tendency to link the qualitative analysis to findings from quantitative investigation. Johnston, Corban and Clarke (1999) looked at qualitative and quantitative techniques and their role in investigating adherence

issues within sports and exercise. They concluded that by combining the two techniques, a more complete understanding of the factors relating to adherence might be possible. In particular, they advocate that grounded theory is an ideal methodology for studying adherence to programmes and that structural equation modelling is an obvious choice for adherence research (since adherence is complex and multi-determined).

Qualitative methodology has been used in this study to take the thesis a stage further and to develop the findings from the quantitative research (Chapters 3 to 5). This chapter sets out the theoretical methodology that has been adopted in the qualitative study. This was an adaptation of the grounded theory methodology of Charmaz (2001) as described by Bennett and Vidal-Hall (2000). The chapter also refers to interpretative phenomenological analysis, since this grounded theory approach requires meanings to be discovered via the interpretation of data. Whilst the current study started with an intention to explore the behaviour of individuals who were referred into the ELC intervention, along with an interest in health locus of control, ideas were not imposed on the data (in line with grounded theory). The researcher was open to other areas and perspectives and had no preconceived ideas about what would result from the data analysis. The aim of the qualitative research was to gain a deeper understanding of the physical activity behaviour in two groups (those who participated in the intervention and those who did not) and to explore factors that influenced this behaviour. The Chapter includes sections on ethics approval, data protection and participant confidentiality, the recruitment of the sample, data collection and data analysis. Details on how the results of the qualitative study are presented are shown in section 6.8.

6.2 Grounded theory and interpretative phenomenological analysis

Grounded theory methods are useful for studying individual processes (e.g. personal experience or emotions). They provide systematic procedures for shaping and handling rich qualitative data and help structure the data collection and analysis. "They are a logically consistent set of data collection and analytic procedures aimed to develop a theory" (Charmaz, 2001, p.27). Grounded theory is an open and flexible approach that takes its lead from the data (seeks to discover meanings via interpretative analysis). It is not driven by theory (preconceived concepts or

hypotheses) but creates analytic codes and categories from the data in order to develop theories that help to explain behaviour and processes. Grounded theory methods originated with the work of two sociologists, Glaser and Strauss (1967) who offered a clear set of written guidelines for conducting qualitative research. They described grounded theory as “the discovery of theory from data” (p.1) and something that is “derived from data and then illustrated by characteristic examples of data” (p.5). A feature of this method is the constant comparison and iterative testing and re-testing of themes. Pope *et al.* (2000) note that in qualitative research the analytical process often begins during the data collection phase, so that data already gathered is able to shape the on-going data collection. This is referred to as interim analysis (Miles & Huberman, 1984) and allows the researcher to check and interpret the data as he/she continues to collect it. Charmaz (1990) points out that variations exist amongst proponents of the grounded theory method. She says that, whilst there was a strong positivist emphasis in the work of Glaser and Strauss (1967) they also emphasised going directly to the real world and starting with issues in it (i.e. a phenomenological perspective). The grounded theory of Strauss and Corbin (1998), like that of Glaser and Strauss (1967) advocates objectivity and minimising the subjectivity of the researcher. Strauss and Corbin (1998) ask that researchers “set aside their knowledge and experience to form new interpretations of phenomena” (p.43). However, this objectivist stance is not supported in the grounded theory advocated by Charmaz (2000). She notes that proponents of grounded theory believe it should include different things. However, she suggests it should offer a set of flexible strategies, not rigid prescriptions, and that it can be used with concepts from other perspectives. She states that “grounded theory strategies need not be rigid or prescriptive”, their focus on meaning furthers interpretive understanding, rather than limits it, and they can be adopted “without embracing the positivist leanings of earlier proponents of grounded theory” (p.510). Charmaz (1990) use of grounded theory is based on a symbolic interactionist perspective, which assumes that human action depends on the meanings that people give to their worlds. Since this perspective could lead to an overly rationalised view of the individual, she also adopts a phenomenological perspective to foster the study of emotions. This combination of symbolic interactionism and phenomenology enables participant’s interpretations of their behaviour and situations to be investigated. She describes her approach as social constructionist, since it derives from a symbolic

interactionist perspective tempered by phenomenology and Marxism (Marxism incorporates the influences of social structures on the individual). The constructionist view assumes and acknowledges an interaction between the researcher and the data, which shapes and directs the analytical process and the emergent theory. As Johnston *et al.* (1999) point out a constructivist epistemology acknowledges that knowledge is socially created. Charmaz (1990) states that “the grounded theory method itself offers a way of constructing sociological reality, using the method fosters developing analytic and conceptual constructions of the data. In their sociological constructions, grounded theorists aim to create theoretical categories from the data and then analyse relationships between key categories. Grounded theorists use emerging theoretical categories to shape the data collection...the groundedness of this approach fundamentally results from these researchers’ commitment to analyse what they actually observe in the field or in their data” (p.1162). Throughout the research and writing process grounded theorists follow interests, leads and hunches that they find or identify in the data. A key part of Charmaz’s perspective is that the researcher assumes an active role in shaping the research process and product. Indeed, “the researcher’s perspective consists of more than philosophical stance, school of thought and methodological strategies, it also consists of experiences, values and priorities” (p.1165). In terms of grounded theory, Charmaz (1990) believes that a theory explains phenomena, specifies concepts that categorise it, explains relationships between concepts and provides a framework for making predictions.

Interpretative phenomenological analysis (IPA) is a method that explores the lived experiences of individuals (in the case of this study with regard to health and physical activity). It recognises that analysis of the data involves interpretation by the researcher (Smith, 1996). The current study adopted an IPA approach, although this was carried out within the logically structured, analytical procedures advocated by grounded theory methodology. It was interpretative since meanings were not immediately transparent but were obtained through a sustained engagement with the text (see data analysis section 6.7). Studies that use a phenomenological approach often use semi-structured interviews as a tool used for gathering qualitative data. This enables rich data to be collected, that can then be analysed to search for meanings and to gain an understanding of the psychological conceptions of

participants (Smith, 2001). The advantage of using a semi-structured interview in this study was its flexibility. It provided a means for participants to talk without a rigid structure being imposed on them. It also enabled them to give a rich picture of their beliefs and perceptions and for the researcher to follow up any interesting avenues that emerged. Responses were not merely reduced to quantitative categories and this enabled complexity and processes to be investigated. The interviews also uncovered issues that had not been predicted or given priority by the researcher. Conducting semi-structured interviews from an interpretative phenomenological perspective involves a number of stages, namely formulation of questions, constructing an interview schedule, conducting the interview, analysis and writing up (see sections 6.6 to 6.7).

6.3 Ethics approval, data protection and participant confidentiality

An application for ethical approval to carry out the study was made to Wirral Research Ethics Committee in July 2002. This was granted in August 2002. In addition, this study followed the ethical guidelines set by the British Psychological Society (BPS: Ethical Principles for Conducting Research with Human Participants 2002). Participants in the study were fully briefed prior to taking part and debriefed after they had participated. In order to ensure participant confidentiality, each interview was given an identification number. These numbers were used to identify the tape recordings of the interviews and tapes did not contain any reference to the participant's identity. The interview tapes were held in a locked cabinet in the Exercise and Lifestyle Centres offices in Argyle Buildings, Birkenhead. The researcher was the only person who had access to them and also transcribed them. Transcriptions of the interviews were given the same identification number as the tape and also held in a locked cabinet in the Exercise and Lifestyle Centres offices in Argyle Buildings, Birkenhead. There was no reference to the identity of the participant in the transcribed data. Quotes from the interviews have been used without any reference to the identity of the participants. Any details of names and addresses were destroyed once the interviews had been transcribed and the tapes were wiped clean.

6.4 Recruitment of the sample

The sample population was all individuals who were referred to the ELC programme between 1 October 2001 and 31 March 2002 (approximately 700 individuals). This sample was divided into two groups, those individuals who did not participate in the programme (referred to as non-participants) and those who did participate in the programme (referred to as participants). The aim of the study was to compare non-participants and participants. The sample was not stratified, but did contain equal numbers of men and women in each of the two groups. This was because the literature identifies gender as a key factor that influences physical activity (the study wished to have sufficient numbers of men and women to be able to explore this fully).

During the months of August to October 2002 invitation letters to take part in the research study (Appendix 9) were sent out. These were sent in small batches to both non-participants and participants from the sample population. An information sheet (Appendix 10), two copies of a consent form (Appendix 11), and a stamp-addressed envelope were also sent out with the letters. People were advised to read the information sheet carefully. This contained details on how participants had been selected, that participation was optional, what would be required, the time commitment, locations, confidentiality and how to take part. If individuals wished to take part, they were asked to complete, sign and return one copy of the consent form, whilst retaining the other for their records. The consent form asked them to confirm that they agreed to take part in the study. It also asked them to confirm that they understood all aspects of the study. As people returned the consent form they were contacted by telephone and an interview date, time and location was arranged. Invitations continued to be sent out in small batches until an equal number of non-participants and participants had consented to take part in the study, with an equal number of males and females within each group. No distinction was made between the primary care group (PCG) areas that participants came from or the health problems they were referred with. This decision was made since stratification in to PCG area or health problem would have limited the population from which the sample was drawn as well as the variation in the participants. This would have resulted in reducing the data to case studies and would have prevented generalisations and comparisons to be made. Subjects were selected with the aim of enabling comparative analysis between participants and non-participants to be made, as opposed to purposively sampling individuals based on previous findings (in order to generate findings that might challenge the emerging theory).

6.5 Sample demographics

A total of thirty two interviews were carried out. Individuals were aged between 27 and 78 and had various CHD risk factors and health problems (Table 6.1).

Table 6.1

Demographic profile of study participants.

Ref. No.	Participant (P) or non-participant (NP)	Gender	Age	PCG area	Risk factors
P1	NP	F	50	BIK	Mobility
P2	NP	F	27	W	Obesity/tiredness
P3	NP	M	70	BIK	Arthritis/heart attack
P4	NP	F	71	BIK	Arthritis
P5	NP	F	29	BEB	Depression/tiredness
P6	NP	M	51	W	High cholesterol
P7	NP	F	71	W	Mobility/Arthritis
P8	P	M	49	BIK	Diabetic/morbidly obese
P9	NP	M	56	BIK	Morbidly obese/poor sight
P10	P	M	61	W	Arthritis/obesity
P11	P	M	53	W	Diabetic/depression
P12	NP	F	50	BEB	Mobility/incurable disease
P13	NP	M	53	W	Diabetic/arthritis/mobility
P15	P	F	64	W	Arthritis/morbidly obese/lupus
P17	NP	F	54	BIK	Back pain/depression/obesity
P18	P	M	71	BEB	Diabetic
P19	NP	M	44	W	Depression/tiredness
P20	P	M	72	BEB	Heart attack
P21	P	M	61	BIK	Depression
P22	NP	F	60	BEB	Morbidly obese/mobility
P23	P	M	63	BEB	Heart problem (angioplast)
P24	P	F	47	W	Depression/morbidly obese /poor sight/obstructed arteries
P25	P	F	72	BIK	High blood pressure
P26	P	F	69	BEB	Smoker
P27	NP	M	78	BEB	Morbidly obese/mobility
P28	P	F	50	BEB	Back pain/morbidly obese
P29	P	F	55	BIK	Arthritis/depression/obesity
P30	NP	M	55	BIK	Depression/morbidly obese
P31	NP	M	72	BEB	Mobility
P32	P	F	37	BIK	Depression/obesity
P33	P	F	37	BIK	Morbidly obese
P34	P	M	61	BEB	COPD/mobility

(key. BIK = Birkenhead. BEB = Bebington. W = Wallasey).

It should be noted that two interviews have not been used in the analysis (P14 and P16). This was due to the fact that these two participants were not naturally very talkative and had difficulty or were reluctant to express themselves. Their narratives were therefore very short and the researcher was unable to draw meaning from them.

A profile of study participants, summarised by gender, age and occupational status, can be found in Chapter 7 (Table 7.1).

6.6 Data collection

Individuals were given a choice of where they would like to be interviewed. Six selected to be interviewed in their own homes (three non-participants and three participants) and eleven chose to be interviewed in one of the Exercise and Lifestyle programmes offices (three non-participants and eight participants). Fifteen preferred to be interviewed by telephone (ten non-participants and five participants).

Although the location of the interviews varied, each was a quiet environment with minimal distractions. A semi-structured interview schedule (Appendix 12) was designed to facilitate data collection. This was divided into five main sections, structured in chronological order from the point of referral in to the intervention through to the time after participants had finished the programme. All five sections were covered with those who participated in the intervention and for those who did not participate, the first two sections only were covered. Section A consisted of a number of short factual questions. These gave participants an opportunity to settle into the interview. Section B covered the point of referral into the intervention and included health, physical activity, the GP visit, and the decision to either take part or not to take part. For those who participated in the intervention, section C explored the time on the scheme in terms of the type of activity, feelings and experience. Section D asked about finishing the scheme, achievements and drawbacks to participation. The final section covered the time after the intervention and included activity, health and feelings. Within each section, prompts were used to help participants who were hesitant answering questions or who had difficulty elaborating on their experiences. However, the interview was not prescriptive and the aim was to learn from the study participants. Participants were encouraged to speak with as little prompting from the researcher as possible.

Each interview lasted between three-quarters of an hour and two hours. Before the interview the study participants were given a short overview of the topics that would be covered and asked to confirm that they agreed to being recorded. They were assured of confidentiality and anonymity. The interviews were recorded on tape using a Sanyo, compact cassette recorder (TRC-950C). Where interviews took

place in person, the tape recorder was placed in a position that was not invasive or distracting to the study participant. Where interviews took place over the telephone, a speaker-phone was used in order to allow the conversation to be recorded. In all cases, the recordings were mostly clear and audible. At the end of each interview the researcher reflected on the content and produced a short hand written memo.

6.7 Data analysis

The researcher transcribed the tape recordings of the interviews verbatim. Any dialogue spoken by the researcher was prefixed by the letter H, (to denote Helen), and any spoken by the participant was prefixed by their identification number. A blank line was left between the researcher and participant dialogue to aid clarity and readability of the transcript. In order to prevent assumptions or misinterpretation of the data, any unclear dialogue was noted on the transcript as unclear and marked in brackets. However, this only occurred in a few instances, such as when participants spoke very quickly with a heavy local accent or used colloquialisms that the researcher was not familiar with. Any audible emotions such as laughter, sharp intake of breath, sighs or pauses were also included in brackets in the transcript, for example (long pause). In addition, if participants raised their voice during the interview, this narrative was transcribed in capital letters in order to give the data emphasis. The process of transcribing the interviews enabled the researcher to obtain familiarity with the context and meaning of the data. The transcription for each interview was saved in a Microsoft Word document. This was referenced with the interview identification number. The pages of each transcript were consecutively numbered and on each separate page the lines of dialogue were also numbered, starting at number one at the top of each new page. The text was then formatted in to double spacing with large left and right hand side margins in order to produce sufficient space to enable hand written comments and coding to be inserted. For each interview a paper copy was then printed out. Transcription of the interviews was carried out within one week of the interview having taken place. The coding commenced after the first few interviews had been transcribed and continued alongside the continued collection of data. This enabled emerging codes to be used to inform the ongoing data collection.

Smith (2001) believes that there is no one correct way to do qualitative analysis. However, the key point is that the analysis should provide an understanding of the complexity and content of the participant's world. The current study used an adaptation of grounded theory methodology from Bennett and Vidal-Hall (2000), Smith (2001) and Charmaz (2001). Each transcript was firstly read through in its entirety, in order to gain an impression of the interview. At this stage, any initial thoughts and interesting points were noted in the right hand margin. Each interview was then re-read line by line and detailed coding was made in the left hand margin of the transcript. The coding process was reflexive and as new codes emerged, they were looked for in earlier parts of the interview. The aim at this stage of the analysis was to be as flexible and descriptive as possible and not to constrain the number or types of codes that were used. There were no preconceived codes and key issues were allowed to emerge from the data (through a sustained engagement with the text and a process of interpretation), rather than being forced into pre-set categories (described as interpretative phenomenological analysis by Smith, 2001). Codes were applied to parts of sentences, whole sentences or a number of consecutive sentences. They were framed in a way that conveyed action in the data, for example 'thinking about the future' and 'acknowledge a need to change'. This approach to coding enabled the processes to be seen clearly. It also allowed the various categories or themes and their connections within the overall process to be defined (as advocated by Charmaz, 2001). For each interview, a hand written list of codes was produced, in the order that the codes emerged from the transcript. The list of codes from each interview was then examined individually to identify which codes related to a similar topic or theme. The theme was written in the margin next to the code. If new themes emerged in subsequent interviews, they were tested against earlier transcripts. Some codes were categorised into more than one theme. As a new theme emerged, the previously produced code lists were revisited to look for the new theme. Fifteen key themes emerged from this process (Table 6.2). In a number of themes similar codes started to be seen over and over again. When this occurred no additional data was found that enabled a theme to be broadened. Therefore, the researcher became confident that these themes had been saturated.

Table 6.2

Key themes emerging from the transcripts

Theme	Theme	Theme
1 Attitudes	6 Health perceptions	11 Scheme delivery
2 Beliefs	7 Health locus of control (HLC)	12 Self concept
3 Expectations	8 Maintenance	13 Self-efficacy
4 Feelings	9 Motivation	14 Time
5 Goals	10 Receiving medical advice	15 View of others

Due to the volume of the codes, a Microsoft Access database was designed to facilitate the sorting and grouping. A code table was set up and the 684 separate codes that emerged from the data were input into the first field of the table. The themes in to which a code had been grouped were input alongside the code, in the next two fields. Each of the non-participant interviews were then set up as fields with a total count field at the end of the sixteen non-participant fields to record the total number of times a code appeared in the non-participant interviews. The same procedure was carried out for the sixteen participant interviews. The final field in the table recorded the total number of times a code appeared in all of the thirty two interviews. Where an interview contained a code, a 1 was entered in the appropriate field in the table.

The completed code table was also copied into Microsoft Excel to enhance the sorting and counting of the codes within themes. The query facility within Access and the sort facility within Excel were then used to produce reports on each of the key themes. The reports included the codes within the themes, the total numbers of non-participants and participants with each code and the origins of the codes (i.e. the interviews that the codes appeared in). A number of reports were produced to facilitate the next steps in the data analysis. These ranged from summary reports for example on the total number of codes within each theme, through to detailed reports for example on all of the codes emerging from the participant interviews and which interviews these had emerged from. A paper printout was obtained for each of the key themes. These printouts included the list of codes within that theme and the counts of non-participant and participant numbers within each code. The printout for each theme was then critically examined in order to group the codes into similar sub themes. Each theme then consisted of a number of sub themes that related to a

particular area of interest. The final stage of the analysis was to group the broad themes into domains that would form the chapters in the thesis. Three main domains emerged from this process (health locus of control (HLC), beliefs about health and physical activity and time). The HLC domain included two themes (HLC and receiving medical advice) and the beliefs about health and physical activity included five themes (attitudes, beliefs, feeling, health perceptions and self-efficacy). If a theme was unrelated to other themes, had few supporting codes or included a large degree of overlap with another theme, it was not used in the thesis. Themes that were omitted on the basis of this process were expectations, goals, maintenance, motivation, self-concept and view of others. The scheme delivery theme was analysed and reported on as a separate piece of evaluation work for the ELC (specifically for the sponsors of the research).

When each transcript was read through for coding, it was also examined to identify any quotes that could be used to illustrate a code particularly well. The quotes were highlighted on the transcript. A Microsoft excel spreadsheet file was created to help manage and sort the quotes. Within the 'quotes' spreadsheet, fifteen separate worksheets were set up and labelled, one for each of the key themes that emerged from the coding of the data. The worksheets contained columns for the quotes, the codes they related to, a reference for the quote (consisting of the transcript identification number, page and line number), and a column to identify whether the quote had originated from a non-participant or participant. The quotes were entered into the relevant theme worksheet. Each theme was then sorted in to alphabetical order by code and a paper copy was printed out for use in the writing up stage of the analysis. Comparative analysis was carried out in order to explore the differences between the non-participant and participant groups. Within each of the domains, the themes and sub themes were examined for both groups. This process identified similarities and difference in experiences and meanings between the groups. The reflective nature of this process enabled definitions and properties for the themes and sub themes to be clarified. The exact methodology used in each domain is detailed in the method section of each of the qualitative chapters (Chapters 7 to 9).

6.8 Results

The results from the qualitative study are shown in Chapters 7 to 9. Each of these chapters consists of a general introduction that includes reference to the relevant literature. A short methods section includes details on the definition and properties of the themes within the chapter. The chapters then have a short introduction to the results, followed by two result sections, one for the non-participant interviews, and one for the participant interviews. The result sections are followed by a discussion that compares the two groups and a summary of the key points that emerged from the chapter.

6.9 Summary

This chapter has outlined the rationale for carrying out qualitative, semi-structured interviews using a grounded theory methodology. It detailed information on gaining ethical approval for the study, the recruitment of the thirty two study participants and their demographic characteristics. Details on where and how the interviews were carried out was described and the structure and content of the interviews has been outlined. The data that emerged from the interviews was analysed using grounded theory methodology and a interpretative phenomenological approach. Six hundred and eighty four codes emerged from this process and were grouped in to fifteen themes. From these themes, three main domains were identified (HLC, beliefs about health and physical activity and time). These form the topics for the next three chapters.

Chapter 7

Health Locus of Control

7.1 Introduction

The quantitative study (Chapter 5) found some evidence to support the utility of using health locus of control (HLC) in order to understand physical activity behaviour in individuals referred to a primary care exercise scheme (the Exercise and Lifestyle Centres (ELC)). A large part of this chapter focuses on the powerful others dimension of HLC (PHLC). This is due to the key role of the powerful other (usually a GP) in referring individual to exercise. Indeed, the findings from Chapter 5 showed that individuals with a PHLC orientation were significantly more likely to complete the ELC programme. This was the case when PHLC was considered as a dimension on its own and also when it was considered as part of the 'believers in control' HLC type (a combination of high internal HLC, high powerful others HLC, low chance), as advocated by Wallston and Wallston (1981). The aim of the Chapter is to obtain an improved understanding of how HLC influences physical activity behaviour. The remainder of the introduction discusses the literature relevant to this Chapter.

The concept of control has been widely used in the psychological literature in order to understand health and health behaviour. Some of this literature has already been discussed in Chapters 2 and 5. In their review of psychological control, Fiske and Taylor (1984) discussed how individuals might react to loss of control. This may be by seeking more information, suffering increased stress, reactance or helplessness. Reactance would result when an individual had a strong expectation of control, whereas helplessness would stem from weak initial expectations of control. They suggest that those most used to having control, such as middle aged men, are the group most likely to show reactance (reactance is discussed later). Whereas, those not so accustomed to control, perhaps women and the elderly, may be more likely to respond to loss of control with helplessness. Feelings of helplessness have been suggested to be similar to feeling incompetent, non-self-efficacious and having a chance locus of control orientation (Wallston, 1997). Wallston suggests that people who feel helpless either do not engage in 'positive' health behaviours or, abandon them before they can have a positive effect on health status. Lefcourt (1980) has

suggested that externals are more likely than internals to behave in ways that are congruent with descriptions of helplessness, and are less likely to actively pursue information relating to their own well being. He also argued that externals are quicker to draw generalisations about their inability than internals and are therefore less able to accept instances of failure. However, an internal believing themselves to be the only one able to handle things may fail to permit others to help them. In addition, if a person has a mistaken self-reliance, when their skills are in fact limited, this could be just as self-defeating as someone who had the opportunity for control but retreated into helplessness.

Lefcourt (1976) and Phares (1976) have both written extensively about the differences in behavioural persistence between those individuals who believe they are responsible for themselves (internals) and those who believe external forces are responsible for events (externals). In general they found that internals show evidence of greater achievement motivation and display greater attempts at self-mastery and control over themselves. Phares (1976) also hypothesised that those with an internal locus of control orientation may resist the efforts of others to persuasion or influence them. He believed that internals would analyse the contents of a message in terms of the potential positive or negative reinforcements that would be likely to result from conformity. In contrast, externals would conform more readily to the judgements of others. Phares (1976) found evidence to show that the attitudes of externals changed more than that of internals, in response to a high prestige source, and suggested that externals are more easily persuaded than internals. This was suggested to be because internals will resist accepting information that is different to their own perceptions of events and favour self-reliance. However, externals may have a strong need for approval and feel that the right behaviour is only possible by paying attention to the cues from others. Internals are less easily influenced than externals, are more independent and reliant on their own judgement.

Wallston *et al.* (1987) carried out a review of perceived control and health. They suggested that the literature often equates beliefs about control with a desire or preference for control, as if those who felt they had control always unquestionably want it. However, a person who feels personal responsibility for their health may not

necessarily want that responsibility. Wallston *et al.* (1987) defined responsibility as an individual's beliefs about what s/he should do, whereas control refers to what s/he are able to do. Therefore, it is possible that a person feels responsible for his/her health behaviour yet does not perceive they can control it. Wallston also suggested that perceived control over health (or wellness) may be quite different to perceived control over illness (Wallston *et al.* 1987). They pointed out that the consequences of holding certain health locus of control (HLC) beliefs can not be dealt with without taking individuals health into account, for example are they ill and attempting to recover/cope/adapt or are they well and trying to remain healthy. In terms of perceived control over behaviour, Wallston *et al.* (1987) suggested that research on attributions regarding preventive health behaviour and adherence behaviour could prove valuable in efforts to change behaviour. They also suggested that attributions about engaging or not engaging in previous health behaviour could mediate continued persistence of the behaviour, for example preventive behaviour that is attributed internally and seen as controllable, should be more likely to be maintained. Wallston *et al.*'s review illustrated the difficulty in making blanket statements about the consequences of perceived control. For example, if a person feels responsible for their health behaviour or status (i.e. they have an internal orientation), yet they do not perceive they have the ability to keep themselves healthy, (low self-efficacy), they suggest that "the consequences may be shame, guilt, anxiety and depression or defensive behaviours such as denial, avoidance or undue reliance on unproven quick fixes" (Wallston *et al.*, 1987, p. 16).

The literature relating to the three dimensions of HLC (internal, powerful others and chance) has been discussed in Chapter 5. It has been suggested that there is some utility in using the HLC concept to explain the general tendency to engage in health promoting behaviour (Weiss & Larsen, 1990). It has also been found that when HLC is used along with other factors, the concept provides a useful way of understanding exercise behaviour (Burk & Kimiecik, 1994). In his review of the factors that influence exercise behaviour, Dishman (1982) found evidence to suggest that HLC may be an important determinant of initial involvement in exercise, although it did not appear to be related to the adherence process. He found that individuals who felt responsible for the consequences of their behaviour (i.e. internals) tended to exercise longer and more frequently than those who felt

behavioural outcomes to be beyond their control. When compared to individuals with internal beliefs, those with chance beliefs have been found to be less likely to engage in health promoting behaviour (Wallston, 1992). The chance HLC (CHLC) dimension has been suggested to indicate a lack of control and it may therefore merely complement the other two dimensions (Wallston, 1992). A negative relationship between CHLC and preventive health behaviour has also been found (Stephens *et al.*, 1994). In terms of powerful others HLC (PHLC) beliefs, it has been suggested that strong PHLC beliefs may indicate a receptivity to the health message or may indicate a strong belief in the medical profession to cure illness (Norman *et al.*, 1998). These beliefs may therefore either be positively or negatively related to the performance of health promoting behaviours. It has also been suggested that PHLC beliefs may be most relevant to illness behaviours (Wallston, 1992). One individual who could be seen as a powerful other is a GP. Indeed, it has been widely argued that GP's are uniquely placed to provide effective health promotion advice to patients (e.g. Nutting, 1986; Stott, 1986). It is estimated that, in the UK, 78% of the population visit their GP at least once a year (Health Education Authority, 1994). This level of face to face contact provides an ideal platform from which to influence the lifestyle choices of patients. However, studies have highlighted a number of barriers to providing physical activity advice. These include limited time available during a consultation and the commonly held perception by doctors that providing lifestyle advice is not effective in changing patient behaviour (e.g. Bauman, Mant & Middleton, 1989). In addition, some GPs cite lack of perceived effectiveness as a counsellor as a barrier (Mann & Putnam, 1989).

There is a growing body of literature on the role of the GP in supporting behaviour change. Consultations that meet patient expectations have been found to result in greater patient satisfaction and an increased willingness to follow advice/treatment (Weinman, 1997). However, older patients have been found to report greater satisfaction with the whole GP-patient experience and be less likely to avoid subsequent treatment (Moore *et al.*, 2004). It has been suggested that ineffective consultations indicate that GPs lack confidence to deal with complex agendas and see them as overly time consuming and also that patients are worried about what is appropriate communication and about wasting GPs time (Barry *et al.*, 2000). Indeed, the lack of information provided to patients in consultations has also been suggested

to result from GPs having too little time and too much to do (Straub, 2001). In fact, Taylor, A. (1999) noted that the average NHS consultation in the UK is seven minutes and he indicates that this is insufficient to incorporate counselling about exercise. Poor communication has been suggested to stem from a variation between GPs attitudes and beliefs about their own roles and that of the patient during the consultation (Straub, 2001). Communication can be eroded by GPs not listening, using jargon and technical language, depersonalising the patient and using stereotypes of them (Taylor, S., 1999). Communication is, therefore, a key aspect of the GP-patient consultation. Indeed, patients have been found to prefer consultations that include communication, partnership and health promotion (Little *et al.*, 2001b). Owen and Vita (1997) have suggested that the more specific the message or advice, the more likely patients are to respond to options for specific actions. In addition, if patients feel they have chosen a course of action for themselves, they are more likely to persist than if they feel it has been forced on them. Ineffective communication has been found to result in unwanted prescriptions and non-adherence to treatment (Barry *et al.*, 2000). However, if the patient feels that the GP has understood and listened to their concerns, they are less likely to avoid treatment (Moore *et al.*, 2004). It has also been found that patient often leave a consultation dissatisfied due to lack of information, poor understanding of the medical advice and the perception that they are unable to follow recommended treatment or advice (Straub, 2001). Straub's review of the GP-patient relationship also found that patients often have an incomplete or inaccurate understanding of the causes of their medical condition and for example may believe the only cure is treatment, when in fact, medication and lifestyle change should be used to manage the condition (Straub, 2001).

Some researchers suspect that non-adherence to GPs advice/treatment may be a response to re-assert control in the patient- provider relationship, as well as over illness more generally (e.g. Taylor, S.,1999). Illness and treatment have an impact on patients' freedom and threaten or restrict their usual activities. Patients may therefore feel that they have lost control over their environment and experience reactance. Reactance theory (Brehm, 1966) can help to explain behaviour when an individual's freedom to act in the way they want to is threatened or reduced. It suggests that an individual will resist and oppose pressure to restrict their freedom and become motivated to re-establish it. However, if the pressure to comply is

greater than the level of reactance, an individual may do what is suggested, although less enthusiastically. A person in a position of power, such as a GP, may therefore threaten an individual's freedom by trying to influence him/her to change. Non-adherence may be a way to restoring freedom therefore, a GP who arbitrarily hands out directives to patients without adequately explaining the reasons for them or the relationship between the restriction and the goal of the treatment, may inadvertently contribute to reactance behaviour.

7.2 Method

Full details of the qualitative methodology can be found in Chapter 6. This includes recruitment of the sample, sample demographics, data collection and analysis. A summary of the profile of study participants is shown in Table 7.1.

Table 7.1

Profile of study participants

		Non-participants	Participants
Total number in study		16	16
Gender	Men	8	8
	Women	8	8
Age range	Under 35	2	0
	35 to 64	9	12
	Over 65	5	4
Occupational status			
Work f/t		5	0
Work p/t		1	2
Retired		5	7
Long term sick		4	7
Housework		1	0
Status on the ELC programme			
Never started (code ns)		9	0
Started and dropped (code do)		7	0
Completed/continued activity (code c).		0	10
Completed/stopped activity (code s)		0	6

In line with Grounded theory methodology, data was coded following careful reading and re-reading of the transcripts, and the codes were then categorised in to similar

key themes. Since the main area of interest in this study is control of health, this was identified as one of the key themes and any codes that related to the three dimensions of health locus of control were initially included in this one overarching theme. Other key themes were also examined to identify if their content was part of the same area of interest, that is control of health. Two key themes emerged from this process to form the health locus of control domain. These were HLC, and receiving medical advice. The latter theme was included since it focused on the interaction between the GP (powerful other) and the study participant. Therefore in this study, PHLC is viewed as a wider concept than merely the belief that powerful others control health (see Table 7.2 for the sub themes and features included in PHLC).

All of the codes within the HLC domain were then examined in order to categorise them into the three HLC dimensions, which would form the main themes (IHLC, PHLC and CHLC). The codes within each of these three themes were then examined to identify similar groupings of codes. These similar groupings formed the sub themes within each theme. Within each sub theme there were numerous features, both positive and negative. Once the sub themes and features had been identified, the full code list was revisited in order to ensure that no relevant codes had been omitted. If a code was found that might relate to one of the sub themes or features, the transcript was revisited and if the code was found to be relevant, it was included in the analysis. The three themes, the sub themes and the key features of each sub theme (i.e. their definitions) are shown in Table 7.2

Table 7.2

Themes and sub themes with the HLC domain

Themes	Sub theme	Features
IHLC	Self-responsibility	The way in which people spoke about health and health related issues being up to them, including: Positive or negative views on responsibility Actions that indicated responsibility for self How self-responsibility was dealt with Problems in taking responsibility for self Motivation or reasons for taking responsibility How people felt when they took responsibility
	Control (internal)	This included peoples narratives about:- What they wanted to control Why they wanted to control something How they took control References to changes in control
	Information seeking	Whether or not individuals found out about health and issues related to it, including the decision making processes involved in particular:- Why information was sought How information was sought Actions taken on the basis of information
PHLC	Initiation of referral	Who initiated the referral, (study participant or health professional. How the health professional respond to being asked for a referral. How did the study participants react to being referred. Did study participants know they had been referred.
	Communication with powerful others	How much information did the health professional give study participants about the ELC programme and physical activity. Was encouragement and/or motivation offered to study participants. How was this offered?
	Relationship with powerful others	Were the study participants open to the advice offered by health professionals? Did the study participants and health professionals listen to one another / show respect / reach agreement?
	Control (external)	Did study participants want others to take control for them? Did study participants want to be provided with a 'cure' rather than doing something for themselves?
CHLC	Genetics	How did study participants talk about fate or chance having an effect on their health?

7.3 Results

7.3.1 Introduction

Three main themes were of interest within the health locus of control domain, internal health locus of control (IHLC), powerful others health locus of control (PHLC) and chance health locus of control (CHLC). The IHLC theme explored ways in which beliefs about health being the result of own actions were operationalised. In contrast, the PHLC theme investigated ways in which beliefs about health being under the control of others were operationalised. It also explored the referral from the powerful other to the ELC along with communication and relationships with powerful others. Finally, the CHLC theme looked at beliefs about health being determined by factors such as fate and chance. Each of the three main themes was present in both the non-participant and participant interviews. However, the way in which they were operationalised differed between the two groups.

Within the IHLC theme, three sub themes emerged from the data, self-responsibility, control and information seeking. Within both the non-participant and participant interviews self-responsibility had both positive (willing to accept responsibility) and negative features (not willing to accept responsibility). One feature emerged from the control theme and again this was present in both non-participant and participant groups. It related to the object of control (e.g. health, physical activity, others), the reason for wanting control and how control was demonstrated. The seeking information sub theme was present in both a positive (seeking information) and negative (not seeking information) way in each of the two groups.

Four sub themes emerged from the PHLC theme, initiation of referral, communication from powerful others, relationship with powerful others and control. Initiation of referral was present in both groups in positive (asking for/welcoming referral) and negative ways (not welcoming the referral). In addition, one negative feature, not having any knowledge of the referral, was only present in the non-participant interviews. Communication from powerful others was present in both groups in positive (being provided with information and explanations about the programme, and being given motivation and encouragement to participate) and negative ways (not having any information or explanations about the programme and not being provided with motivation or encouragement). Only the participant group

was given specific motivation in the context of expected outcomes. In the relationships with powerful others sub theme, one negative feature (not open to advice) and one positive feature (open to advice) emerged in both groups. However, only non-participants sought specialist advice whilst only participants voiced a negative view of their GP. The control sub theme was present in both groups. It includes narratives about wanting others to take control and wanting to be given something by the GP, as opposed to taking personal action.

Within the CHLC theme one sub theme called 'genetics' emerged from the data. This was present in both groups and related to how study participants talked about the effect of genetics on their health.

The findings from the non-participant interviews are divided into the three main themes, IHLC, PHLC and CHLC (Section 7.3.2). Within each of these themes the separate sub-themes are shown, and their features are presented. Results from the participant interviews are shown in the same format (Section 7.3.3). After each narrative, a reference is shown in brackets. This relates to the study participant unique identification number, their gender, age and status on the ELC programme (Table 7.1). The status on the programme enables the findings to be discussed in terms of factors that influence initiation, maintenance and cessation of physical activity.

7.3.2 Non-participants

7.3.2.1 Internal health locus of control (IHLC)

Within the IHLC theme three sub themes emerged from the non-participant interviews, self-responsibility (n=8), control (n=2) and information seeking (n=9).

Self-responsibility

There were two contrasting features to the self-responsibility sub theme. On the one hand, non-participants realised they had to take responsibility for themselves (n=4), whereas, on the other, they found it hard to do this and had an inability to accept responsibility (n=4). When they spoke about realising they should take responsibility for themselves, non-participants said, for example:

I knew it was up to me self. I was on me own really to do something. Err, but the thing is with me self I am up and down. One minute you know, it

could be something I'm due to go for a night out in a few weeks (slight laugh) and suddenly the diet just starts but then soon afterwards it goes back to normal again, you know. (P2/F/27/do)

However, this woman found it hard to take responsibility and believed this was to do with her being 'up and down'. She also explained how:

As time has gone on, I haven't found any time for me self you know. When you've finished work and everything. So (takes deep breath), err, I just left it basically. (P2/F/27/do)

A further example of this was another young, working woman who explained that:

Err, it's up to me self really to make me feel better and err, I know health wise as well, I mean, I'm not sort of massively overweight or anything. I mean but I could do with losing a bit of weight. (P5/F/29/do)

She suggested why she found it hard to take action and said:

You get yourself to that stage where you feel totally drained every night when you come in. I haven't motivated myself to do it, so that's why I think I haven't done it. (P5/F/29/do)

Both of these women cited being tired at the end of the working day as a reason for not taking responsibility for their health. Whilst they both recognise they should be responsible for themselves, which they illustrate by the words 'up to myself', their examples indicate that they do not believe they are capable of taking responsibility for themselves. Neither of them put their need to take self-responsibility into context in terms of past behaviour or future plans. In addition, their motivation for considering physical activity was very general and expressed as making themselves feel better. Part of the reason why they found it hard to take self-responsibility was that they needed motivation in order to take action and for others to take control. Wanting others to be in control is also shown as a feature in the PHLC control sub theme (Section 7.3.2.2).

Wanting motivation from others was one way in which non-participants operationalised difficulty (or unwillingness), in accepting self-responsibility. Some of the words they used to explain this included 'inspiration' and 'push'. One man for example, felt that being with others would give him the push he needed and said:

I wanted to err, get some sorts of inspiration to get me on to it. Err, and I thought well, if I can join in with other people, maybe that would get me into it. (P19/M/44/do)

His use of the words 'get some sorts of inspiration', suggest that he is looking for this from an external source rather than it coming from within himself. When he did initiate activity, he needed someone to support him. When this was not available he ceased activity. He explained:

I kept going at it, trying to complete the 12 weeks, but I'd always find an excuse to you know, after a few minutes, dip out, even though it wasn't very far away from where I lived. (P19/M/44/do)

He was unable to organise his own activity and take self-responsibility for this and illustrates this by saying:

I was just left to it. So it was a case of trying to organise myself in to some sorts of routine. But you can't because people are using the equipment and I found it just, I found it more hard work trying to figure out what to do next, you know. (P19/M/44/do)

In order to attempt to address this, he attended at less busy times. However, then the problem was that:

You can get on every machine but you, there is no body else there, there is no one to talk to, there is no one to egg you on. (P19/M/44/do)

Once again his response indicates that he is seeking motivation from others external to himself. This is shown in his words 'no one to egg you on'. He has difficulty exercising on his own. Another non-participant spoke about the impact of exercising in isolation and said that:

Sometimes you go to the gym and its lame you know going on your own. It's nice to have somebody to like, push you, you know. (P2/F/27/do)

She used the word 'push' to indicate that she wanted some one else to prompt her to exercise. This feature was also present in the interview of another non-participant who said:

I need that little push you see. (P4/F/71/ns)

She did not say whether this would have been welcomed however, she does say that:

I don't want to be doing any exercise at my age. (P4/F/71/ns)

This indicates that she would not have welcomed or responded to being pushed to initiate. Whilst these non-participants wanted to be pushed, one described how she had been:

...fighting the surgery for 2 years... (P22/F/60/ns)

This was for them to take responsibility for her blood pressure and illustrates her unwillingness to take responsibility for her own blood pressure. This example also illustrates the 'wanting others to be in control' feature in the PHLC theme (Section 7.3.2.3).

In terms of gender, age group or occupational status, there were no notable differences between the two features of self-responsibility. However, those who attempted physical activity and then dropped out were more likely to have demonstrated evidence of a willingness to take responsibility.

Control (internal)

The control sub theme was present in the non-participant interviews (n=2) and also, to a greater extent, in the participant interviews, (n=7). The data included in this section focuses on internal control only. External control is presented in the PHLC theme (Section 7.3.2.2). Non-participants discussed control in terms of wanting to please themselves and having the freedom to choose what they did. For example, one man referred to control as being in charge and said:

Social services rang me and they like to have their own way, as if they are in charge of peoples lives and they are not in charge, they are there to do a job. (P27/M/78/do)

He voiced the same sentiment about his GP and expected the GP to give him what he asked for. This man also wanted control over his exercise environment and to undertake activity where it was convenient for him. He describes how:

I went swimming once. You go down vertical steps, and of course I slipped and I bashed me shin right down the ladder you see. I didn't go swimming again. She said (the advisor) we could send you to Guinea Gap (another centre). I said, I'm not trailing all there just to swim just for the sake of a pair of steps you know. (P27/M/78/do)

He decided not to exercise because the venue that had access for him was not the most convenient for him to get to. This was despite the fact that he had his own

transport. The other example is a woman who spoke about her freedom of choice in terms of commitments. She believed that:

Your not committed to anything in life really are you? You have a free mind to speak you mind. (P4/F/71/ns)

Both of these non-participants wanted control and had an expectation that this control could extend to all aspects of their lives. For some other participants however, taking control involved seeking information.

Information seeking

There were two features to this sub theme, seeking information (n=3) and not seeking information (n=6). A number of non-participants made an effort to find out more information about their health and the ELC programme (n=3). They wanted this information to be easily and quickly available. One non-participant for example was referred to the programme in order to reduce his cholesterol. He explained how rather than arranging to take part in physical activity, he:

..was more interested in finding out what level to reduce my saturate intake to. (P6/M/51/do)

In order to find out, he rang the programme to ask for advice. Another non-participant who saw a leaflet on the programme asked his GP about it and described how:

I saw the leaflet about 12 weeks of activity and we talked about the problem and one of the things that helps is loss of weight. (P31/M/72/ns)

Whilst he exhibited information seeking, he did not initiate activity because he found an easier option to 'cure' his health problem.

Some non-participants were told about the scheme and then went to ask their GP about it (n=2). One woman heard about the scheme from a nurse and said:

It was the nurse in the practise, she said, you know, have you thought about exercise for your back. So she thought that would be good, she said ask one of the Doctors about it, so I did. (P17/F/54/do)

Whilst the other non-participant found out about the scheme from a colleague and explained how:

Some one I worked with went on it and was enthusiastic about it. Err, and told me that I should go on it and I should have a word with my Doctor, which I did. And then he put me through for it. (P30/M/55/do)

Each of these non-participants took action on the basis of the information they were given and asked their GP for a referral. However, whilst they obtained information, they were unable to translate this into sustained physical activity behaviour.

In contrast to those non-participants who showed evidence of seeking information about health and physical activity, the majority of non-participants did not exhibit this behaviour (n=6). Some of those who did not seek information did not see it as their responsibility to do this (n=3). They expected the information would be provided for them. For example, one woman blamed her GP for not providing information and said:

I probably could have done with a lot more information, to try, and get, because that's what I need, motivating. I didn't get any details what to expect. (P2/F/27/do)

Her response suggests that she did not immediately initiate activity due to lack of information, motivation and not knowing what to expect. One other non-participant made reference to not being given information and said that the GP:

...didn't give me sort of great details on it, err basically I assumed that it was err, to do with your lifestyle in general. (P5/F/29/do)

She found it hard to seek help from her GP, which may explain why she did not ask for any more information. Communication between a GP and patient emerged as an important sub theme and is shown under the PHLC theme (Section 7.3.2.2). Her example also shows that because she did not receive information she made an assumption that the programme was not applicable to her. Making assumptions was also present in the interviews of other non-participants (n=6). These non-participants did not seek information because they felt that they already knew about the programme and what would be required of them. For example, one woman explained that one of the reasons she had not initiated activity was because:

I'm finding it quite difficult to walk actually. (P1/F/50/ns)

Her example shows that she assumed she would be required to do activity that was more demanding than walking. Another non-participant who had been through cardiac rehabilitation explained that:

My knee tends to give in sometimes, you know, and the apparatus would give me trouble. (P3/M/70/ns)

He makes the assumption that he would have to do gym work, since this is what happened when he was in cardiac rehabilitation. He believes that his knee is not up to it, suggesting a lack of self-efficacy. In addition, some non-participants made assumptions about what initiation would cost their self-esteem (n=2). For example one man assumed he would have to exercise at set locations which made him feel uncomfortable because:

Too many people know me and I'd be getting 'skitted' left, right and centre. (P13/M/53/ns)

This implies that he feels his acquaintances would make fun of him if they saw him exercising. His decision not to initiate activity may therefore, partly be due to peer pressure. The other example is a woman who was concerned about gaining access to the activity location. She explained that:

My psyche was more important than arriving at the Oval and finding that I couldn't get to where the appointment was and being embarrassed. (P12/F/50/ns)

She was not prepared to find out information about accessibility and never started on the ELC.

Whilst there were no notable differences between gender, age and employment status and whether non-participants demonstrated information seeking, those who did not seek information were more likely never to have started, whilst those who did seek information were more likely to have attempted physical activity then dropped out.

7.3.2.2 Powerful others health locus of control (PHLC).

Within the PHLC theme, four key sub themes emerged from the non-participant interviews, initiation of referral, communication from powerful others, relationship with powerful others and control (Table 7.1). These sub themes were also present in the participant interviews, although the features were different (see 7.3.3.2).

Initiation of referral

This sub theme included a number of features (Table 7.1). The first related to who originated the referral. The majority of non-participants did not ask their GP for a referral to the programme (n=13). In addition, the GPs did not tell some of these

non-participants they had been referred (n=3). Two of these never started on the ELC. When one woman received a letter from the ELC she said she felt:

...a bit stunned (P7/F/71/ns)

This was because she did not know that her GP had referred her. She explained that after getting the letter:

I went back to the rheumatologist and she said, I don't want you doing anything like that yet. (P7/F/71/ns)

She was cautious about starting activity and discussed it with her specialist since she was concerned about activity causing her harm. The specialist discouraged her from exercising at the present time. The other non-participant who never started hoped his GP would give him something to help him lose weight and said:

I wanted a dietician to be truthful. (P9/M/56/ns)

For this non-participant the referral was unexpected and also unwelcome, since he did not want to be referred for exercise. The non-participant who did initiate exercise described how:

I don't think he told me anything. He said it's a referral. It was a phone call that came through Doctors err clinic, his health centre, saying, from a secretary, they'd referred me to the lifestyle clinic. That was it really, a message on my answer phone. (P6/M/51/do)

Whilst the GP did not discuss activity or the referral with him, he assumed that he had been referred due to his high cholesterol and said:

I doubt very much if I was referred to you without any reason. (P6/M/51/do)

His example shows that he believed his GP had a good reason for referring him. He did start on the scheme after the interview with the researcher but ceased to exercise shortly afterwards due to lack of time and a family bereavement.

GPs did tell most non-participants they had referred them to the ELC (n=10). These non-participants had not asked for a referral and reacted to it in different ways. For some the referral was not welcomed (n=5). In two cases this was because it was unexpected. For example, when asked if she wanted to initiate activity on the programme one woman said:

Well no, probably not, because I wasn't expecting to come out with that. (P2/F/27/do)

For others the referral was not welcome because they did not want to feel under pressure to exercise (n=3). Two women, for example said:

It was more them pushing the issue at the time than actual me...It wasn't something that I didn't really want to do, or, you know, I didn't like exercise, or anything like that. Err, but I was feeling as though I was being pushed into something, that I wasn't going to enjoy it, and that I didn't, you know, that I wasn't bothered with. (P22/F/60/ns)

And:

Well he sort of wanted it more than I did (slight laugh) really...well I wasn't especially bothered honestly (laughs). (P1/F/50/ns)

The responses highlight a conflict of interest with the medical advisers and feelings of being pressurised into doing something they had no motivation to do. The women felt that others were concerned about them taking physical activity, whilst they were not. This feature was also present in the interview of another woman who said that:

I don't think it was explained. Well when I say not an awful lot, she (the GP) told me what it was the exercise fit and exercise and err gave me the number to ring. And when I got home, I thought oh heck, I can't be doing with this you know, I mean I don't feel as though I want to exercise and I was erm, very sceptical about it. (P4/F/71/ns)

None of these women wanted to do something they did not feel bothered about, because they believed it would not be of benefit to them or be something they would enjoy. Indeed, women were four times more likely than men not to welcome the referral and as a consequence not to initiate activity.

In contrast to those who did not welcome the referral, some did welcome it as the motivation they needed to initiate physical activity (n=2) and said:

I thought if I had the discipline of having to go somewhere at a certain time each week, do you understand what I'm getting at? (P12/F/50/ns)

And:

I need something doing, but I needed like a cattle prod effect to try and get me going and I think I needed err, to go out with people who are like meself. (P19/M/44/do)

Both of them recognise they need motivation in order to initiate activity. However, whilst the man briefly attempted exercise, the woman never started due to a belief that her self-esteem would suffer.

In contrast to the non-participants who did not initiate the referral, some had asked their GP for a referral (n=3). They found out about the programme a colleague, a promotional leaflet and a nurse. Two men explained how:

A colleague said it had done her good and I should try it. She was very enthusiastic about it, erm told me I should go on it and I should have a word with my doctor, which I did and he put me through for it. (P30/M/55/do)

And:

I saw the leaflet about twelve weeks of erm activity and we talked about the problem with my foot. (P31/M/72/ns)

Whilst the first man did briefly start activity and then drop out, the second found another solution to his problem and never started. The third non-participant who asked for a referral wanted to improve her back problem, in order to do more everyday tasks. She obtained encouragement from the practice nurse who gave her information on the programme. However, when she asked the GP for information and a referral he said:

I am not sure whether you would be able to do it or not. (P17/F/54/do)

She thought that:

He was more concerned about the exercise hurting me rather than making me better. (P17/F/54/do)

However, since she believed that physical activity would benefit her, she did start the ELC programme, only to later drop out mainly due to illness. These examples illustrate that an intention to start physical activity (indicated by approaching the GP for a referral) does not translate into physical activity behaviour. The narratives also show that when non-participants approached their GP for a referral to the programme, they received different responses. These ranged from offering encouragement, to words of caution and discouragement and also lack of interest, illustrated by just signing the referral form and making no comment about physical activity or the ELC programme. In addition, each of these three non-participants showed evidence of finding out information about the programme and are therefore, also discussed under the IHLC sub theme 'seeking information'.

Communication from powerful others

Two features emerged from this sub theme. The first was the level of information and explanation about the ELC programme that non-participants were provided with. Over half of non-participants did not receive an explanation or detailed information about the ELC programme from their health professional (n=9). When asked what information they had been given, one non-participant summed this up as:

Perfect nothing. Absolutely nothing. (P2/F/27/do)

She went on to explain how:

He (GP) didn't go into any detail, it was just easy to just, you know, not turn up sort of thing. I didn't know what to expect, I didn't know what that, what that the, your place was all about. (P2/F/27/do)

Another woman explained that:

She didn't give me, sort of, great details on it. Erm basically erm, I mean I assumed that it was erm to do with your lifestyle in general erm sort of to help you sort of make you feel a bit better, like whether it'll be exercise or talking to people. I didn't know, I think that what I thought it was. (P5/F/29/do)

These two women worked full time, did not know what to expect from the programme and did not ask their GPs for clarification. However, after the interview with the researcher, when they had been able to gain more information, they attended for an interview with an adviser, yet dropped out within a few weeks of starting. In addition to providing insufficient information and explanation about the ELC programme, the GPs did not tell some non-participants that it was up to them to make contact with the programme (n=2). One of them explained that:

I wasn't made aware that once he had referred me, I actually had to contact you. (P22/F/60/ns)

The other described how his GP said:

I'll get you on this course. I said yeh, I'll have a go and so the next thing I got a letter to appear or a number to ring and I rang in. (P27/M/78/do)

Both were prompted to participate by a letter from the ELC programme. However, whilst the man started and then dropped out, the woman never started since she did not believe it was something she would enjoy or that it was of importance to her.

In contrast to this, some non-participants did receive some information and explanation from their health professional (n=5). One non-participant said his GP had explained:

It was to do with putting you in the gym. He wasn't too much up on what there was, only the gym and swimming. (P19/M/44/do)

His response shows how the communication was very brief and lacked specific details, which was the case for all other non-participants.

The second feature to emerge from this sub theme was whether health professionals provided encouragement to non-participants to start activity and if they made reference to any outcomes that could be expected from physical activity. Some non-participants were offered motivation to exercise by their health professional (n=3). One said that his GP:

..told me to get on me bike, he told me to get out and walk and do this, that and the other and go out and do a bit of swimming. But he said he would refer me to this as well, cause he said it might help. (P19/M/44/do)

Whilst encouragement was provided, no specific outcome in terms of health improvement was mentioned. This was also the case for one other non-participant who explained that his nurse:

...said it would probably do me some good if I did some exercise of some description. (P3/M/70/ns)

Both of these men use words that indicate doubt that physical activity would benefit them, illustrated by their use of the words 'might help' and 'probably do me some good'.

In contrast to these non-participants, half were not offered motivation by their health professional (n=8). In some instances, they were discouraged from starting exercise (n=2). One woman (who has already been mentioned in the initiation of referral sub them) said her GP had said 'I'm not sure you would be able to do it or not' (P7/F/54/do). The other woman (who has also been mentioned before) said her specialist said 'I don't want you doing anything like that' (P17/F/71/ns).

Relationship with powerful others

The first feature to emerge from this sub theme was openness to the advice of health professionals (n=9). Most non-participants demonstrated that they were not open to

the advice given to them by health professionals (n=8). Some of them felt that the health professional wanted them to do something that they did not agree with (n=5). In many instances, this involved losing weight, as one non-participant described when she said:

Every time you go down the surgery, they go on about your weight... My weight loss wasn't particularly at the time, my concern. (P22/F/60/ns)

Her example shows that whilst the health professionals were concerned about her weight, she was not. Similarly, another non-participant was not concerned about their health condition and explained:

I'm diabetic you see. And they just err, I have problems. I'm, alright really (laughter) but I'm supposed to lose weight. Me readings were up high, me blood sugar. (P13/M/53/ns)

His use of the words 'I'm supposed to' show a conflict of opinion with his GP. Whilst he feels he is 'alright' the GP wants him to lose weight. Similarly, when asked how he felt about being advised to lose weight, another man replied:

Oh, it can't do any harm. (P31/M/72/ns)

In each of these cases, the non-participants did not believe losing weight was important to them. There was also no evidence of them having a discussion about it with their GP. However, for some non-participants there was some evidence of a discussion or negotiation about the referral with their GPs (n=2). One woman described how her GP:

...was more concerned about the exercise hurting me rather than making me better. And I said to him, it can't get any worse really, and I'd like to get some benefit out of this. And he said, take it easy, or words to that effect, you know what a Doctor would say. (P17/F/54/do)

She felt it was important for her to exercise and lose weight, although her GP disagreed with her, she was not open to his advice. The other woman felt that she was consulted by her GP and that they had worked together to find a solution which would motivate her to exercise and also be within her capability. She explained how:

My GP and I we racked our brains to try to think. (P12/F/50/ns)

However, whilst this non-participant reached an agreement with her GP she never started activity. This was due to a belief that it may have had a negative impact on

her self esteem, which is a theme that is picked up in beliefs about health and physical activity (Chapter 8).

Some non-participants did act on the advice of their GP and started to exercise on the programme (n=4). However in each case the activity stopped shortly after initiation. Each of these non-participants showed evidence of not being open to the advice offered to them by the exercise advisers. One man described how

When I was on me own working out, I would actually have a go on things for me back, even though I wasn't probably supposed to because I might have done some damage. (P19/M/44/do)

One other man said:

I'd like to have a lot more upper body exercise you know where you can use the machines. I used them once when she wasn't looking. (P27/M/78/do)

These men did not follow the exercises that were recommended for them which may have resulted in injury, activity being beyond their capabilities, lack of benefit and ultimately loss of interest.

Two non-participants looked beyond their GP's advice to specialists for a diagnosis of their health problem. One woman was waiting for confirmation of her condition and explained how:

You know I have been to see Doctor about it and I've had it x-rayed. Erm and they have just said it's arthritis and you know just see what the orthopaedic people say. (P1/F/50/ns)

She was not prepared to initiate activity on the advice of her GP and sought reassurance that it was the correct course of action from specialists. This feature was unique to non-participants and did not emerge from the participant interviews.

Control (external)

Two features emerged from the non-participant interviews within the control sub theme. The first was 'wanting others to be in control' (n=6). Women (n=4), those who were working (n=4) and those who never started activity (n=4) were more likely to demonstrate this feature. Some non-participants wanted their GP to make a decision for them (n=3). For example, one man said:

I don't know if this depression is still me or I don't I'm still on prozac as well and I want to get off it and I want to, I want to let me doctor decide. I'm still going no where doing nothing really. (P19/M/44/do)

One woman also wanted her Doctor to make a decision for her since she did not want to take control herself. She explained how:

I haven't felt great for a long time, which is why I went to Doctor as well in the end and it takes a lot for me to go to Doctors for things like that... I hadn't really discussed anything with anybody err, or done anything about they way I'm feeling until I went to see Doctor really. I hadn't really done much, you know, just feeling down or what ever I didn't like taking control or any thing daft like that you see. (P5/F/29/do)

She explicitly states how taking control herself is not something she considers is 'daft' rather than a sensible option. A second woman was also determined that her GP should provide the solution to her medical problem and said:

The blood pressures kicked in with high blood pressure at the moment and I've actually been fighting the surgery with that for 2 years and er, it's only since I've moved and its gone extremely high that something's been done about it (P22/F/60/ns)

She was determined that the GP should provide a solution for her despite receiving advice that changing her lifestyle would reduce her blood pressure and remove the need for medication.

Non-participants had different perceptions of who their powerful others were. The majority made reference to their GP, however, one non-participant spoke about what would make them participate in the programme. He believed that motivation to participate could be achieved via sponsorship and said:

I'd do it on a sponsorship with the pub I run, then I'd have to do it (P9/M/56/ns)

When asked if he had any expectations from the programme he again made reference to others being in control. This time it was the exercise advisors, who he:

..was hoping could give me a programme to work to, and erm, I would do it you know (P9/M/56/ns)

One other non-participant also expressed a desire for the exercise advisor to continually decide what he should do and believed:

It was a case of trying to organise myself into some sorts of routine, but you can't because people are using the equipment and I found it just (pause) I found it more hard work trying to figure out what to do next, you know.

(P19/M/44/do)

He wanted the adviser to control his exercise and make sure he did it. This is shown when he says:

They didn't seem to be any checking to see if, whether you were doing all the ones you were supposed to. There was nobody checking up, there was nobody sort of watching you or what you did. So I could have been in there ten minutes and walked back out again and they wouldn't have noticed.

(P19/M/44/do)

He found physical activity a difficult option and wanted the advisers to control this for him. He was one of two non-participants who wanted to give control to others because they believed this would be an easy option (n=2). He said he would have liked it if:

someone give me a pill with a bit of motivation and a bit of confidence to go on. (P19/M/44/do)

The other non-participant did not expect her GP to advise exercise to help her medical problem, but expected:

some sort of miracle (giggles) you know something like, I don't know, not think, yeh, probably be expected to be given something. (P2/F/27/do)

These non-participants would have preferred to be given something. This suggests they wanted their GP to provide them with an immediate cure for their problem.

The second feature to emerge in the non-participant control sub theme was a belief in cure not prevention (n=6). Some evidence to support this feature has already been shown under wanting others to be in control. In particular that non-participants wanted cures in the form of pills or solutions from their GP. One non-participant summed this up as:

All I was concerned about was healing the symptoms. (P31/M/72/ns)

Rather than exercising to lose weight and prevent pain in his foot, he found a cure that was quick and did not involve any effort on his part. Another non-participant wanted an easy way to lose weight and thought that:

There might just be some trigger that I'm not picking up on that might just help alter the way diets work for me (P22/F/60/ns)

Her use of the word 'trigger' indicates that she is seeking an easy and quick way to achieve her goal. Another woman explained that she takes:

...tablets for the panic attacks. (P17/F/54/do)

These examples indicate that non-participants would rather take tablets and pills to obtain a solution or cure for their health problem. They may also show that non-participants do not believe that their actions can have an impact on their health. One woman in particular did not believe her actions would impact on her health because she had an incurable disease. She explained how she had previously:

...tried through the hospitals to get physiotherapy, but they wouldn't do it, because I'm not a good bet because I can't be cured. (P12/F/50/ns)

Whilst this is an unusual example, it illustrates that non-participants may not have talked about prevention because they did not believe it was an option. It should be noted that a desire to find an easy option was also present in the participant interviews. However, participants did talk about prevention, whilst non-participants did not.

7.3.2.3 Chance health locus of control (CHLC)

The key feature to emerge from the CHLC theme was genetics (n=3). Those non-participants with this feature were most likely to be women and never to initiate activity (n=2). The feature of this was that genetics was believed to be responsible for health and life span. Two non-participants believed that genetics was responsible for their health condition and one woman said:

I have seen young children on zimmer frames with it. Dr. said to me that arthritis is in the genes, my sister is now complaining. (P7/F/71/ns)

Her response demonstrates both CHLC and PHLC and suggests acceptance that the medical profession will control her arthritis. This is because she believes it is due to chance and she is unable to personally alter this condition. In particular she is in pain and feels powerless and incapable of doing anything about it herself. One other non-participant also demonstrated a combination of HLC beliefs when she said:

I have a family history of various things that crop up you see, and erm, whether that the inherent thing has anything to do with it I don't know. (P22/F/60/ns)

She explained how she felt about her condition as follows:

I mean arthritis will take its toll whatever, but the last thing I want to try and avoid is to get into a position where I'm going to have real difficulties moving because my joints are seizing up. (P22/F/60/ns)

Although she believed her health would continue to deteriorate due to genetics, she did want to take some preventative measures to remain functionally fit, indicating she also had some IHLC beliefs. One non-participant believed that genetics would determine his life span and said:

We have got a lot of longevity in the family, so I'm going to go on until I am 100, at least, ever lasting life is what we talk about in the bible anyway. (P27/M/78/do)

His narrative also shows a focus on time and the future, which is picked up as a separate domain in Chapter 9.

7.3.3 Participants

7.3.3.1 Internal health locus of control (IHLC)

Three main sub themes emerged from the participant IHLC theme, self-responsibility (n=13), control (n=7) and information seeking (n=7). These three sub themes were also present in the non-participant interviews (Section 7.3.2.1).

Self-responsibility

Self-responsibility was present in two contrasting ways. The majority of participants expressed a willingness to take responsibility for themselves (n=12). Although one participant had issues taking responsibility for her self, this is an isolated case which may provide an example of why individuals initiate activity and then cease once structured support is withdrawn. This participant struggled to maintain activity over the duration of the programme and then ceased to exercise. She described her problem as follows:

I am morbidly obese, and it's dangerous you know. And I know that, but actually dealing with it is very hard. (P33/F/37/s)

Her quote highlights that she knows there is a risk to her health. However, she seems unable to accept responsibility for doing something about the problem. Her subsequent narrative describes how:

I know that my health is important. If somebody, sometimes I think, do you want somebody to say to you, if you don't lose weight you're gonna die in six months, do you think that would help. I don't know, it bloody wouldn't. I'd probably go on a big downer. I can't really deal with it to be honest with you, it's too big a thing to comprehend, it's got well out of hand.

(P33/F/37/s)

Finding it hard to take self-responsibility was also present in two of the non-participant interviews. These non-participants were also young, working women.

In contrast to this, twelve participants did speak about a willingness to take self-responsibility. They did this in a number of different ways. One example of this was saying they were happy to take responsibility for their own activity (n=3). This is shown in the interview of one man who described how he:

... didn't bother with them (the advisors) a lot but that was probably my choice. It was up to me to go and ask them if I wanted any particular advice isn't it? They went over the whole thing with me at the beginning and you know then I was on me own then, which suited me I suppose. I thought was fine and off I went and did the old targets. (P10/M/61/s)

This participant uses the words 'up to me'. These words were also used by non-participants who realised they had to take self-responsibility. However, unlike non-participants, participants placed responsibility into some context. One example of this is that in addition to talking about taking responsibility for their activity whilst on the programme, two participants spoke about how they had always taken responsibility for their health and activity in the past. One man said:

I've always looked after me self really. Always exercised. (P18/M/71/c)

The other man said:

I walk every day. I mean that keeps the doctor away, it keeps you sort of, cold and flu's seem to bypass you and things like that. I think you have got to do some like that to control your health. (P21/M/61/c)

His use of the words 'you have got to' show that he sees his health as his own responsibility. His example also describes how he controls his health and indicates that he believes exercise prevents him becoming ill.

Taking responsibility for themselves in order to prevent health problems was another way in which participants spoke about self-responsibility (n=4). This was particularly noticeable in the interview of one woman who said:

I suppose if you've got a really serious illness, you know. Like a very serious illness sort of, no one knows what will happen in the future with your illness. But err, no one know how long you, you know. But there's preventative ways isn't there, do you know what I'm saying. (P32/F/37/c)

She describes her depression as 'serious' and believes there are ways she can control the future of her illness. She also spoke about why she initiated activity:

I wanted to become healthier and preventive measures in the future you know. Err, with me being quite overweight, you know, might prevent any illness in the future or at the present time from occurring. (P32/F/37/c)

Once again she used the word preventative. The reason she wants to take preventive action is because:

I feel as if my health's one of the most important things for now and for the future really (laughter). I'm trying to prevent anything happening in the future, if I possibly could by exercising and trying to look at me diet a little bit. (P32/F/37/c)

Her response also shows that she takes a longer-term perspective and looks beyond the twelve week programme. She is prepared to take responsibility in order to maintain her health in the future (Time is discussed in Chapter 9). Taking self-responsibility in order to prevent future health problems was also evident in the interview of one woman suffering with pain. She described how:

I keep my ligaments stretched and I find I don't hit huge pain barriers like used to, cause I, keeping my ligaments stretched, cause they'll go back very quickly if I don't. (P28/F/50/c)

She uses the words 'they'll go back' to show how she believes she is preventing pain by stretching. Prevention also emerged as a feature of the participant's control sub theme.

Another example of how participants spoke about willingness to take self-responsibility was with respect to gaining satisfaction from taking action (n=2). One participant was pleased they had taken responsibility and said:

I am pleased with myself for having taken certain actions that's allowed me to improve. (P8/M/49/c)

This man attributed the improvement to his own actions. This attribution is also present in the interview of one woman who believed that:

I've seen bigger improvements since I've stayed on. And I suppose in a way, as well, I'm managing it mostly myself. So that's quite good, you know, saying well I'm doing this myself now. I'm in control of it as well.

(P28/F/50/c)

She uses the words 'doing this myself' to show that she is the one taking responsibility for the improvement in her health.

A further way in which participants spoke about taking responsibility for themselves was with reference to information or advice (n=4). For example, one man referred to both advice and information when he said:

I mean they tell you don't they. The paperwork says what you should do, so it's up to you. Whether you want to do it or abuse it. (P23/M/63/c)

His use of the words 'it's up to you', show that he acknowledges it is up to himself to act on the advice or information. He also takes responsibility for obtaining information on his blood pressure reading. He described how:

I get back and check me own blood pressure, when I get back. It is always OK, but sometimes now and then it is a bit high and I think, why is that?

(P23/M/63/c)

Having obtained his blood pressure he then sought further information and an explanation for the reading. A second example is a woman who said when her GP was not taking her seriously she:

...really stuck up for myself. (P15/F/64/c)

This woman took responsibility for obtaining the information from her GP.

Receiving advice about taking responsibility was also present in the interview of one diabetic man who described how:

Now touch wood, I have nothing wrong with my heart, but being diabetic, I am told that one of the problems associated with the disease is, err, if I don't handle my condition is the possibility of heart disease and the like.

(P8/M/49/c)

His words 'if I don't handle my condition' show that the responsibility for his health is his own. He refers to receiving advice by saying 'I am told'. A woman also received similar advice and described how her GP:

...explained to me that it's only me that can stop it now. That it's only me that can change my life. And Oh, a lot of thoughts went through me head at the time. And err, I was, well I thought I don't want to die. (P24/F/47/c)

In the case of these two participants, the advice clearly set out that it was up to them to take responsibility. The following example shows how this advice was taken on board when the woman says:

Put it this way. I didn't realise that I was that heavy. I didn't realise I had this artery problem. And me cholesterol was very high. And I think, I thought well you know there's only me can do it. (P24/F/47/c)

This woman was willing to accept self-responsibility since she believed the advice and that only she could improve her problem. Willingness to take self-responsibility is summed up in the response of one man who described it as:

...an outlook, that you can be as miserable as you wish and you can stay in bed all day. You can moan that everybody is against you or everything else is against you, but at the end of the day there is only you. You know when you are born you are on your own. When you die you die on your own. (P8/M/49/c)

His interview indicates a strong sense of belief that he is willing to take self-responsibility. Like most other participants in this sub theme, he believes his health is important, that he has the capability to take action and that his health is controlled by his own behaviour. Of the participants who demonstrated a disposition to take self-responsibility, 75% were likely to continue with physical activity beyond the end of the ELC programme.

Control (internal)

Another sub theme to emerge from the participant interviews was control (n=7). This was also present in the non-participant interviews, although to a lesser extent (n=2). Data presented in this section focuses on internal control and external control is discussed under the PHLC theme (7.3.3.2).

Participants discussed control with specific reference to a number of different issues. For example, a number of them voiced a general desire for control (n=4). This includes wanting to control others and wanting to control health. One participant described himself as 'aggressive' in his quest to control his health (P8/M/49/c). One other said that if people tried to tell her what to do, she would:

...tell them where to go (P25/F/72/s)

This woman consulted her Doctor yet was determined to be in control of her medication. This is shown in her interview when she talks about her high blood pressure and says:

I've had it a long time you know. Just keep the pills going. I'd been dizzy and getting a lot of headaches, so she (GP) said we'll have a moder...I said I'LL TAKE IT EVERY TUESDAY. Right, so I take it every Tuesday.

(P25/F/72/s)

These two participants were driven by what they felt was the right thing for them. They knew what they wanted and got help from their GP to enable them to achieve this. Yet, ultimately they maintained control. Another way in which participants expressed a general desire for control was with respect to maintaining current health. This is shown in the interview of one man who controlled his health because he didn't want it to deteriorate. He compares himself to other and says:

The average person, they don't seem to bother do they. You see someone with a belly sticking out like this (shows with hands) and you think whhowh, my god. I can't understand people letting themselves go like that really.

(P18/M/71/c)

His motivation for control is that he doesn't want to 'let himself go'.

Another way in which participants discussed control was with specific reference to exercise (n=2). When talking about exercise two men described how:

I suit myself. If I want to come to the gym, I do, If I don't I won't. If I don't want to go to the gym I don't, it's as simple as that really. (P18/M/71/c)

And:

I tend to come when it suits me to come. If it doesn't suit me, I wouldn't do it. (P23/M/63/c)

Both men express a desire to please themselves when they exercise. This is shown by the words 'suits me'. The desire to please themselves and have the freedom to

choose what they did was also a feature of the non-participant interviews. However, the participants both talk about their motivation for exercising. The first man does not want to 'let himself go' and the second said that his motivation for exercising was to:

...keep up a level of fitness for as long as I can. It is staving off the ageing process isn't it really. I mean some people just die of a heart attack like that and if you have done nothing, what a waste. If you have done something to try and stave it off and it happens, well there is not much you can do. So that is my policy like you know, to keep exercising to try and keep yourself in shape. (P23/M/63/c)

The examples show that both men used the fitness suite flexibly to fit in with other aspects of their lives. Their use of the words 'let themselves go' and 'staving off' indicates how prevention of future health problems is important to them and is also one of the reasons why participants took self-responsibility for their health.

References to time, in terms of the past, present or future are explored in more detail in the Time domain (Chapter 9).

Participants also discussed control with reference to their diet (n=2). One man talked about being in control as follows:

I know what I'm doing and when I'm doing it, and I seem to get control that way, do you follow me. Because it can be quite a harsh regime, trying to keep your sugars, your fats, your cholesterol all below certain figures. But if you do it, you do get benefits in other ways you see. But we are not saints. (P8/M/47/c)

The second man gathered information that led him to attribute his angina to a poor diet. As a result of this he was now careful to control his diet and felt that:

I'm probably different to a lot of other people. Some people just don't know do they, haven't got a clue. But I've always been interested to know. And naturally after my angina business, I wanted to know why it's happened to me. (P23/M/63/c)

This man had a strong sense of internal control. This is particularly shown in his following response when he refers to starting physical activity and says:

Well as far as I am concerned I am up and running now. It is up to me to keep it going. If I don't it's me own loss. I'm the only loser. So I intend to.
(P23/M/63/c)

This example indicates a belief that activity results in benefits and that a loss will occur if it is discontinued.

Another participant referred to benefits in terms of controlling pain (n=1). She illustrates how she feels there has been a change in control when she says:

I feel more in control of the disability. I feel more in control of the pain, rather than the pain being in control of me. It's always there but I'm in control now. (P28/F/50/c)

Starting exercise under specialist supervision enabled this woman to realise that she could take control, which she explained as follows:

It made me realise I could do it, it wasn't failure to come down, yes but still go on the bike but don't do as much, drop your level. I was still doing something, so it wasn't failure it was just a you know, hauling the horses a bit and then you know, let yourself slowly pick up again. Managed, it was managed. Felt it was managed, it was in control. It didn't get away from me. (P28/F/50/c)

She implies that her self-efficacy has changed during the programme. In particular, before the programme she felt that pain controlled her and had doubts about adhering & coping with the pain. Whereas, after the programme she feels she is in control and able to cope with it.

In contrast to the other participants, one woman discussed control in terms of wanting it, but also being unable to cope with it. She explained how she felt she was:

...a person who needs a certain amount of control. And when you lose it, you lose it and I think I've just got to accept it now that when I lose control, I lose it. (P33/F/37/s)

Although this is an isolated example, it is also an important and striking illustration of someone co-existing with an illness. This woman was one of four women who demonstrated control. However, she was one of the three women who stopped

exercise after the end of the ELC programme. In contrast, all of the men who demonstrated this disposition continued with their activity after the ELC.

Information seeking

The majority of participants carried out information seeking behaviour (n=6).

However, one participant did not seek information and explained that:

Somebody phoned me and err, I was sort of took along to the next stage. I suppose a lot of it is not having the knowledge of knowing exactly what to do or where to go. Err, then not making the effort to go out and find out more.

(P10/M/61/s)

His example shows that lack of knowledge and motivation resulted in him having to be prompted to initiate activity. It also implies that his GP did not give him sufficient information. In contrast to this participant, those who did seek information did this in a variety of ways. One way was by finding out about the exercise environment, after they had been referred by their GP (n=2). This is shown in the interview of one man who said:

I came here (the leisure centre) after she asked me about coming here, the nurse. I thought I'll go down the Concourse and see what the Leisure centre is like. (P18/M/71/c)

He took the initiative and visited the Leisure Centre in order to gather more information. He did this in order to make a decision about whether to attend activity on the programme or not. Another way in which participants spoke about seeking information was by gathering knowledge about their health condition (n=2). They sought this information from a variety of sources including books, papers and the Internet. One man described how he has:

...always been interested to know. And naturally after my angina business, I wanted to know why. (P23/M/63/c)

He was receptive to the information and illustrates this by saying:

I mean you should keep yourself at it. I mean every thing says so. All the books and papers always say, exercise is good for the heart. (P23/M/63/c)

He sought information in order to inform his decision about how to control his health. In addition, he took responsibility for finding out what physical activity he should be doing and said:

No one has come round now and said what do you do exactly. I have only got information myself. (P23/M/63/c)

His example illustrates each of the three sub themes within the IHLC theme. In particular that in an attempt to control health, participants take self-responsibility for finding out about their health condition and then acting on this information. This behaviour is suggested to be the outcome of an internal HLC belief as opposed to a belief that powerful others have control over health.

Men and women were equally likely to seek information. However, only the men who demonstrated this sub theme continued with activity beyond the end of the ELC, whilst in contrast, all of the women stopped exercising.

7.3.3.2 Powerful others health locus of control (PHLC)

Four sub themes emerged within the PHLC theme for participants, initiation of referral, communication from powerful others, relationship with powerful others and control. Each of these was also present in the non-participant interviews however, the features within them differed.

Initiation of referral

The features within this sub theme include where the referral originated from, from the health professionals or the participants, and how they each responded to it. For the majority of participants, the referral was recommended by their health professional (n=10). This was a GP, nurse or cardiac rehabilitation specialist. In all cases, the health professional gave some information about the ELC programme to the participant and obtained their agreement before referring them to the programme. A number of these participants did not welcome the referral, each was aged over 70 (n=2). One man described how the diabetic nurse had attempted to persuade him on numerous occasions to join the programme:

She said, do you fancy going, I said no not really. I go to the one in Heswall. But she said it's costing you money that...but I said alright then. You know, it is very good she said, errm they have instructors there to keep an eye on you (P18/M/71/c)

His response shows how he was already attending a private gym. However the nurse felt due to his diabetes, he would benefit more from having specialist supervision. The other participant who did not welcome the referral explained how:

I got an award for six months..so that's how I got on it, it was nothing, I didn't want to do the exercises really, but I just thought I might as well do something. (P25/F/72/s)

She had won a leisure centre pass for being volunteer of the year. Her GP felt that she should not exercise unsupervised due to her health problems and therefore referred her to the ELC programme. However, her example shows she would not have initiated any activity unless she had received the leisure centre pass as a prize.

Some participants did welcome the referral and believed it was the motivation they needed in order to initiate activity (n=6). Two thirds of these classified their occupational status as long term sick (n=4) and this was the group most likely to continue with the physical activity beyond the programme. For example, one man felt that:

without being referred to the scheme I would never have probably done anything about it. Err, I probably wouldn't, I'm a bit of err, I need a, that little push to get going type of thing. (P10/M/61/s)

He went on to explain that he had eventually initiated activity because:

I couldn't let the Doctor down. I suppose they have been good enough to recommend me and put me into it and it costs somebody money.

(P10/M/61/s)

His response suggests strong PHLC beliefs, which motivate him to comply with the referral. He was one of three participants who whilst believing they needed motivation to initiate, did not adhere in the longer term.

In contrast to this, other participants who welcomed the referral as the motivation they needed, did maintain activity in the longer term (n=3). One explained how he welcomed being pushed to do something and said:

It was just a kick up the backside to do something which was good, which I appreciated, you know. (P21/M/61/c)

His subsequent response shows how he is receptive to the health message and also enjoyed the activity:

Now I know for a fact that exercise is good for you. I know that and so err, I was just pleased to get a kick up the backside and get onto it, you know. I enjoyed it, yeah I really did. (P21/M/61/c)

One other man who adhered in the longer term acknowledged he had a health problem but would not have initiated activity without the referral to the scheme as his following response demonstrates:

I says, well yeah why not because it's not open to everybody, it is only if you've got a problem. And that gets me if you like, doing it and gets me into the gym system, which I probably would not have bothered with on me own bat. (P23/M/63/c)

In addition to seeking motivation, participants also welcomed support to get them started. This is shown in the interview of one woman who said:

What I was personally looking for was someone who could get me on the road to finding err, an exercise regime for myself that I could build on. (P28/F/50/c)

These examples show that participants would not have started physical activity without a referral to the ELC programme.

In contrast to these participants who did not initiate the referral, some asked their GP for a referral (n=6). They found out about the programme from different sources, including friends, family and other health professionals they were already involved with. Three of these participants completed the twelve weeks and then ceased activity. One participant who heard about the programme from his sister described how his GP laughed when he asked about the scheme because:

I don't think he ever thought I'd ever really meant to go on a course, you know. I think he just thought I was acting the goat. Because my level of fitness is nil ...(laughter). (P11/M/53/s)

This participant received no encouragement from his GP when he said he was a bit worried about getting unfit and felt his GP was not bothered. He explained why he had not continued activity after the twelve weeks and believed it was:

...just laziness I think, you know that's all it is. I don't know, if the course was still running I'd still be going (laughter). It is that kick up the backside I need you know. (P11/M/53/s)

His example shows how he feels the need for continual motivation to remain active. One other participant also received no encouragement from her GP and was just given a leaflet on the ELC programme. She primarily asked to be referred to the programme to get her out of the house. She also stopped after the end of the

programme. The third participant who did not continue beyond the end of the programme had an eating disorder and hoped the exercise would motivate her to lose weight whilst her GP thought the programme may help her combine diet and exercise in order to lose weight.

In contrast, three other participants who asked for the referral did continue to exercise beyond the end of the programme. Each of these had found out about the programme from health professionals they were already involved with. They were all concerned about their health condition and believed physical activity would benefit them. One of them described how his GP was:

Encouraging, there is no doubt about that...and he put it to me that for it to be advantageous to me I would have to commit myself at least twice a week and I would have to try and stay the course. (P8/M/49/c)

This participant was particularly keen to know what he would need to do in order to see an improvement and pressed his GP for specific information. One other participant was motivated to improve in order to be fit enough for an operation and explained how:

The surgeon said he would not operate until I was fitter than what I was. (P34/M/61/c)

Whilst the GP referred him to the programme, ongoing motivation came from the surgeon who monitored the changes in his fitness level. Another woman also received motivation from her GP. He monitored her weight for her and continued to encourage her to exercise and lose weight even after she had finished the programme.

Communication from powerful others

The first feature to emerge from this sub theme was the level of information and explanation about the ELC programme that participants were provided with. This was also a feature of the non-participant interviews. During the referral consultation with their health professional, all participants were provided with information on the ELC programme (n=16). However, the extent of the information differed. The majority of participants knew the basic details about the programme before they started, whilst some were given very good information (n=4). One said that his GP told him:

...that he had become aware of this course. I think he himself had suffered three heart attacks over a two year period and I may be incorrect in this, but I think it came out of his association with recovery programmes on heart conditions and the like. (P8/M/49/c)

One other participant said that her GP:

...told me all about the health, what's it called...and then he told me about it and he said that so many people had been going to him erm, with such good reports. (P15/F/64/c)

In each of these instances, the GP either drew on personal experience of prevention or rehabilitation programmes, or had received feedback from other people about the ELC programme. Two other participants received good information when they attended the cardiac rehabilitation programme at St. Catherines Hospital in Wirral following heart problems. One of them said that:

After fifteen weeks at St. Catherines, I more or less knew what to expect. (P20/M/72/c)

In the case of these two participants the information did not come from their own GP but from the specialists at the cardiac rehabilitation unit. All of those who were given good information continued with physical activity beyond the end of the ELC programme.

The second feature to emerge from the communication from powerful others sub theme was whether health professionals provided encouragement to participants to start activity and if they made reference to the benefits that may result from physical activity. Participants reported that health professionals provided variable levels of encouragement and motivation. Some participants received no motivation at all (n=3). An example of this is one participant who when asking their GP for a referral to the scheme felt that:

He wasn't really interested to be honest. (P11/M/53/s)

This man, along with the other two participants who received no encouragement, did not continue activity after completing the programme. However, other participants did receive motivation from their GP (n=8). All except one of them continued with physical activity beyond the end of the ELC. One participant said the GP was encouraging and told her how:

How good it (physical activity) was for you. (P15/F/64/c)

This GP did not refer to specific outcomes that would result from physical activity. However, for some participants the encouragement to take activity was given in conjunction with information on the outcomes that could be expected from being more active. For example, one participant who had suffered with heart problems in the past described how:

They explained to me very clearly that it will help me and that was the main incentive. (P20/M/72/c)

He wanted to avoid future problems with his heart and believed the advice that activity would help him do this. For other participants, motivation was also offered by making them aware that an outcome from physical activity would be prevention of health problems (n=3). In some cases participants were warned about the consequences of continuing with their present lifestyle. One man said that:

Being diabetic, I am told that one of the problems associated with the disease...is the possibility of heart disease. (P8/M/49/c)

The use of the words 'I am told' show he has been given information on the outcome that may result from his diabetes if he does not exercise. Another example of this is a woman who explained how:

The consultant had said to me, I could either have a heart attack or a stroke. And of course that devastated me more so, because I lost me Mum with a stroke. So that really upset me when he said that. (P24/F/47/c)

She then went on to say that:

He explained to me what this furred up artery means and I was devastated. I felt, god, I'm going to die. (P24/F/47/c)

Her responses show that she has been told about the outcome that would result from continuation of her current lifestyle. They also suggest that she acknowledged there is a risk to her health if she does not exercise and change her lifestyle.

Whilst three participants had the outcomes from physical activity explained to them in terms of preventing future health problems, others made this connection for themselves (n=3). One woman said, for example that:

I knew I wasn't exercising me heart and I knew I was storing up trouble for meself in years to come. (P28/F/50/c)

One man described how the specialist had told him that:

This operation could get you back out of the wheelchair, back on your feet.

(P34/M/61/c)

He was determined to exercise in order to obtain the level of fitness needed in order to have his operation. In addition, he believed there was a risk to his health if he did not exercise and said:

The grandkids errm, twelve months ago I didn't think I'd see them next birthday. (P34/M/61/c)

All of those who were either told about health outcomes from activity in terms of prevention, or acknowledged it themselves, continued with activity beyond the end of the programme (n=6).

One other participant's example is interesting to mention in this sub theme. It describes how she would respond to being told about the risk to her health. She is an unusual case due to her history of eating disorder, yet she illustrates how communication of health risk may not promote behaviour change:

I know that my health is important. I think, do you want somebody to say to you, if you don't lose weight you're gonna die in six months, so you think that would help. I don't know, it bloody wouldn't, I'd probably go on a big downer. (P33/F/37/s)

This participant believed her problem was 'too big a thing to comprehend' and whilst she valued her health and acknowledged the risk, this was not sufficient to motivate her to continue with activity.

Relationship with powerful others

One feature that emerged from relationships with powerful others was how open to advice participants were (n=12). Some participants talked about how they had a conflict of interest with their GP. In particular they were unwilling to comply with advice if they were happy with their current position (n=2). The following examples from two men show how their GP had told them to lose weight but they felt this was not necessary. The first said:

I am just sticking around fourteen and a half stone now, which is about right, cause I'm six foot two and a half. So I mean, if I go below that, I'm going to start looking like a bean pole aren't I? But they say well you can get down to

thirteen ten. I said, I'm not going down to thirteen ten. I'm quite happy the way I am now. (P18/M/71/c)

This participant was not receptive to the recommendation of his health professional and disagreed with them. However, he did believe that activity was good for him. The response of the second man suggests he disagreed with his GP when he says:

I'm sixteen stone, but I'm nearly six foot, so I can get away with a little bit, errm, Doctors told me to lose weight. (P10/M/61/s)

He believes that for his height his weight is acceptable. However, his interview suggests that his doctor disagrees with him.

In contrast to those who were unwilling to listen to advice, most participants did listen to the health professionals and were receptive to their advice (n=10). Nine of these ten participants continued to exercise beyond the end of the programme. One example is a participant who was open to advice from medical professionals since he wanted an operation. He explained how:

They wouldn't operate until I was fit and I wanted the operation. So I was determined to get fit. Well fit for them like. (P34/M/61/c)

In addition, he was receptive to the advice of the exercise adviser and described how he maintained his activity at a level he was capable of by monitoring his heart rate according to advice given to him:

He (the adviser) said, but if it gets to 130 odd, slow down or stop until ye heart beat comes down and that's what I did. I just followed his advice. (P34/M/61/c)

Another participant said that she wanted to exercise on the programme in order to:

Get any advice off the staff that were trained that would really help me. (P32/F/37/c)

This example demonstrates willingness to accept help. Another woman who felt she needed help described how if she had been on her own:

I don't know then how I would have responded if I'd had problems. You know like ... the pain barrier's going up with this and what am I doing wrong. And like the adviser would say, well we'll find another way of doing that... (P28/F/50/c)

Each of these participants respected the exercise advisers and worked with them to improve their health condition. They did not attempt exercise that was not

recommended to them, therefore, they had a programme that was within their capabilities and that slowly showed benefits.

Only one participant who demonstrated being open to advice did not continue with activity beyond the end of the programme. She explained how she felt she had to act on the GP's advice and how:

Well before I come away, the doctor said, now you will go won't you. I said yes I will. When I have appointments, when the doctor makes appointments, I always go. (P29/F/55/s)

She felt it was important to follow her GP's advice. This shows she is receptive to the health message and indicates strong powerful others beliefs. These beliefs enabled her to sustain activity for twelve weeks which was what the GP had 'prescribed'. Whilst she viewed her GP in a positive way, as some one who must be listened to, other participants viewed medical professionals in a negative way (n=3). One of them said:

I hate going to the doctors and hospital sort of thing, and so I think if I keep myself fit, I wouldn't have to go to the doctor...laughter. (P18/M/71/c)

One other described how visiting the GP made him feel and said:

I think a lot of that is tension, me blood pressure, because I don't like going to Doctors and nurses and thing you know what I mean, I get tense and everything. (P10/M/61/s)

These two men did not view visiting their GP as a positive experience and had negative feelings about their GP. Another non-participant had a negative view of her GP and described how:

I'd been so angry about, erm, you know their opinion of me...I suppose was...I think they just assumed I was one of these people, you know who had had a problem all of her life and didn't really want to do anything about it. (P15/F/64/c)

She went on to explain that:

All this weight came on and I was in a bit of a mess and I actually had a bit of a row with the doctor and I said, I think I have just been a joke to you and you know I really did get angry. (P15/F/64/c)

She believed that the GP had a pre defined or stereotyped image of her and therefore did not listen to her, or take her seriously.

Control (external)

One of the features that emerged from the control sub theme in the participant interviews was 'wanting others to be in control'. Only one participant demonstrated this feature and expressed a desire for others to be in control. However, this was an unusual case and the feature only emerged from the interviews when she spoke about her eating disorder becoming uncontrollable for her. She explained that:

I know I'm a person who needs a certain amount of control, and when you lose it, you lose it and I think I've just got to accept it now that when I lose control I lose control. (P33/F/37/s)

She also described that in one instance:

There came a point where I thought I've got to go and speak to the Doctor because I don't know what to do. (P33/F/37/s)

In addition to support from her GP, she also wanted direction and decision making from her exercise advisor and said:

I felt that she allowed me to make the decisions, with hindsight may be that wasn't a good thing. (P33/F/37/s)

Whilst this participant wants control herself, she does not believe that she is able to cope with it at certain times and therefore, feels that she wants others to take over control of her problem.

The second sub theme to emerge from the participant interviews was a belief in cure rather than prevention (n=3). When asked about her blood pressure one participant did not believe physical activity would have any effect on it and said:

That's a load of rubbish. I've had it a long time. Just keep the pills going. (P25/F/72/s)

She was one of three women who took tablets for her condition. One of the others also took tablets for her high blood pressure and believed that this condition was genetic. This is discussed in the next theme on CHLC beliefs. In addition, the third woman kept returning to her GP and asking for tablets for her arthritis. She explained that:

I had to ask the doctor if I could try some other tablets. (P29/F/55/s)

Each of these three women did not continue activity beyond the end of the programme. Their interviews suggest that they do not believe that they can prevent

their conditions or that their own actions will have an effect on their health conditions. They also indicate that they believe the only way to manage their condition is via medication, or a cure from the doctor.

7.3.3.3 Chance health locus of control (CHLC)

A number of participants spoke about how chance or fate affected their health (n=5). Some believed that a deterioration in health was just something that may happen over time as a health problem progressed (n=2). This is also discussed in the time domain (Chapter 9). One participant explained how:

My joints feel a bit achy and me hip is a bit achy and that you know, and whether its just progressing, whether its just getting worse, or whether its because I've stopped on the keep fit, I just don't know. (P10/M/61s)

He was unsure whether the deterioration was due to cessation of activity or just 'one of those things', due to fate and the natural progression of the problem. The second participant said:

Me hands have gone a bit distorted, but you see, things happen when you get a bit older don't they. (P26/F/69/s)

One participant believed that genetics affects ability to participate in certain activities. She felt that innate ability prevented her from participating in running and said:

I'm not a born runner anyway, I never was. I've no co-ordination, Phhhh, I'm never gonna do running. (P33/F/37/s)

Reference to innate ability is shown by the use of words 'not a born'. It is implied that individuals are born with certain abilities and if they do not possess them they should not, or can not, take part in activities that require these abilities.

Three participants believed that genetics has an impact on physical health and psychological well being. One spoke about how, information from a specialist, led him to believe that genetics may be accountable for his angina:

Naturally after my angina business, I wanted to know why it happened to me because I didn't smoke, I keep my weight down, I've always kept fit. There is two things this guy said, really it's hereditary, with your parents, and probably a poor diet when you were younger. (P23/M/63/c)

Whilst he accepts genetics may explain his condition, he also believes that his own behaviour can have an impact on his angina (see IHLC theme). One woman also attributed her high blood pressure to genetics and explained:

I've still got to stay on the medication because there is high blood pressure in the family, on my fathers and mothers side. So you know, but it is kept under control. (P26/F/69/s)

A second woman believed that genetics may determine confidence and self-esteem and explained how:

I don't know why I should feel like I do but it's just one of those things that happen unfortunately. My mother was the same, and my daughter, it is a struggle for her as well, it must be some sort of family trait, I don't know (P15/F/64/c)

She considered that a genetic predisposition to lack self-confidence might be the likely explanation for how she felt. Whilst she continued activity beyond the end of the programme, three of the five participants who demonstrated CHLC beliefs did not maintain activity beyond the end of the programme.

7.4 Discussion

7.4.1 Introduction

Discussion of the findings is divided in to three sections (IHLC, PHLC and CHLC). Within each section, the non-participant and participant groups are compared and contrasted. The differences between each group in terms of their participation (or not) in physical activity, both on the ELC programme and beyond it, are also discussed. In addition, any notable age and gender differences in physical activity behaviour are discussed. The final section summarises the key points that emerged from this Chapter (Section 7.5.5).

7.4.2 Internal health locus of control

Whilst a few non-participants acknowledged that it was up to them to take self-responsibility and to do something about their health, they did not appear to have the capability to achieve this (due to 'being up and down', lack of time and tiredness due to work). Indeed, Wallston *et al.* (1987) has suggested that even if people feel they should be responsible for their health, they may not necessarily want this responsibility, or believe they are capable of taking it. Therefore, a mismatch

between feeling responsible for health yet not feeling able to take responsibility might result in non-participants exhibiting denial, avoidance or reliance on quick fixes, as was the case in this study. This evidence, combined with non-participants' desire to be motivated and inspired by others is suggested to indicate a lack of self-efficacy, which is an important component in Wallston's modified social learning theory (Wallston, 1992). Self-efficacy is explored in Chapter 8.

Non-participants did not put taking responsibility for themselves into any context or give specific reasons why they should take action, merely referring to wanting to feel better or less tired. In contrast, most participants did speak about self-responsibility. They did this in a specific way in terms of ensuring they achieved sufficient physical activity each day, looking after their diet and preventing health problems in the future. Participants felt responsible for taking action based on the advice from their GP whereas non-participants did not. There was evidence in the participant interviews to suggest that it may be those who perceive their health is at risk who are most likely to be receptive to information and advice on health and to be prepared to accept some self-responsibility as a result of this belief. Participants who demonstrated self-responsibility were likely to maintain activity in the longer term, indicating a belief that they were both capable of taking responsibility and of controlling their health. This belief in capability may have developed during the ELC programme. Beliefs about health and capability to exercise are discussed in Chapter 8.

Participants were much more likely than non-participants to demonstrate a desire for control (i.e. to have IHLC beliefs). They talked about what motivated them to control aspects of their health and put this into context in terms of future outcomes. In particular, they viewed physical activity as a means of controlling their current health in order to prevent future health problems. This suggests that they had outcome expectancies that physical activity would have a positive influence on their health and that this provided them with the motivation to engage in physical activity. In line with the findings from research by Laffrey and Isenberg (2003) this study found evidence that perception of a behaviour being worthwhile and an expectation that it will produce a valued outcome, may be important conditions that are required for individuals to take action.

Non-participants were most likely to expect information to be provided for them, rather than searching for this themselves. The findings indicated a number of reasons for this. Firstly, they were insufficiently interested in their health or unconvinced of the benefits of physical activity to want to know more about their health or the Exercise and Lifestyle programme. Secondly, the cost of taking part in activity, such as loss of self-esteem, was perceived to outweigh any benefits they might receive. There was also evidence that non-participants made an assumption that they would be required to undertake activity that they believed was beyond their capabilities, suggesting that lack of self-efficacy prevented them from seeking additional information. In contrast to the non-participants, participants saw it as their own personal responsibility to find out more information about their health condition and the specific exercises and environment offered by the Exercise and Lifestyle programme. This may have been because they put a high value on maintaining their health and preventing its deterioration. In addition, they believed that their own actions could effect their health and also that they had the capability to undertake activity. In particular, they believed that physical activity was an important factor in helping them to achieve their outcome expectations. Whilst there were no notable gender differences in the IHLC features of participants, men who demonstrated control or sought information were more likely to continue with activity beyond the end of the ELC programme. This would suggest that gender mediates the influence of IHLC on the maintenance of physical activity behaviour.

7.4.3 Powerful others health locus of control

Both non-participants and participants initiated a referral to the ELC, although participants were twice as likely to do this. Whilst this indicates an intention to start physical activity it did not translate into behaviour change for non-participants in the short term, or for half of participants in the longer term (beyond the ELC).

Participants who initiated the referral and continued activity after the ELC were likely to be off work with long term sickness. This would support the suggestion that it is important to take individuals health in to account when exploring HLC (Wallston *et al.*, 1987). These participants were already ill and probably attempting to recover, adapt or cope, which they believed to be valued outcomes from participation in activity. Participants were much more likely than non-participants to

welcome the referral, suggesting they generally had a stronger external HLC orientation than non-participants (Phares, 1976). Participants' greater tendency to welcome the referral could also have been supported by the fact that they were much more likely than non-participants to have received information and explanations about the ELC. Indeed, participants were much more likely than non-participants to have had a positive experience in the GP referral consultation. All participants were aware they had been referred, whereas some non-participants were referred without their knowledge. Non-participants were also more likely not to have been given information about the ELC programme or merely to have been given very general details. In contrast, all participants were provided with information, which in some cases was very specific. This finding supports existing research which emphasises the importance of good communication in the GP-patient consultation and how this contributes to adherence to treatment recommendations (e.g. Little *et al.*, 2001a; Barry *et al.*, 2000). Due to lack of communication and a partnership approach in the GP consultation, non-participants may have been left feeling dissatisfied with the information, having a poor understanding of the advice and a perception that they were unable to follow the advice (Straub, 2001). Evidence from the non-participant interviews also showed that the outcome of the consultation, in terms of a referral to exercise, did not meet their expectations. In contrast, participants did not talk about the referral being unexpected and few were dissatisfied with their consultation. This may be one reason why they were more willing than non-participants to follow the GP's advice (Weinman, 1997). Indeed, the outcome in terms of the benefits to be gained from activity and the risks of not changing current behaviour, were explained to many of the participants. In addition, participants were given encouragement to exercise, whereas few non-participants received encouragement and some were actually discouraged from exercising. Not only did the GP consultation influence who did and did not participate in the ELC programme, it also influenced who continued with physical activity beyond the end of the programme (those participants who received good information and motivation continued). In addition, all of the participants who were either told about health outcomes from activity in terms of prevention, or acknowledged it themselves, continued with activity beyond the end of the programme. It is suggested that they realised their health was at risk, & that preventing health problems was a valued outcome for them.

Non-participants were more likely than participants to demonstrate a negative relationship with both their GP and exercise adviser (powerful others). This was in terms of having differences of opinion with them, not listening to them or not respecting their advice. It suggests that non-participants felt their freedom to do what they wanted to do was being threatened. They wanted to remain sedentary and for the GP to provide a quick solution to their problem which would cure it, or to engage in physical activity only on their own terms. Non-participants may therefore have suffered reactance (Brehm, 1966), resisted and opposed pressure from the GP or exercise adviser and, therefore, restored their freedom by never starting activity or dropping out shortly after starting. In addition, non-participants may also have suffered reactance, if they believed that crucial facts or arguments had been omitted from the communication they were given. These findings support existing research that suggests that the more specific the message or advice is, the greater the likelihood that patients will respond to it and take action. In addition if people feel they have chosen a course of action for themselves, they are more likely to persist with it than if they feel it has been forced on them (Owen & Vita, 1997). Indeed, participants may have been more receptive to advice since they received specific information and believed they had chosen to take part in physical activity. They may have made this choice because they believed their health was important and that physical activity could enable them to obtain valued outcomes. Indeed, only the participant group talked about the positive outcomes of physical activity in terms of prevention of health problems. In contrast, non-participants were much more likely than participants to want a cure to be provided for them. This may have been because they did not believe prevention was an option. They may have believed that health runs its course no matter what, that no personal actions can impact on it, or that when health deteriorates the solution is to go the medical professionals to obtain a cure for the symptoms of the problem. Three women participants did talk about cure as opposed to prevention. They had proved they had the capability to exercise by completing the 12 weeks. However, they did not believe exercise had an impact on their health, therefore, the reinforcement for their behaviour was not health. In fact their narratives showed that they participated to prove they were still young enough to do it, to get out of the house & to comply with the GPs instructions. Each of them stopped exercising at the end of the programme, which would suggest that prevention of health problems is an important factor that contributes towards

maintenance of activity. Prevention could be viewed as an internal HLC orientation since it is to do with personal action, whereas cure could be viewed as an external HLC orientation since it implies reliance on the actions of powerful others. There is also evidence here that an external orientation and belief in cure may increase with age (two of the three participants demonstrating a belief in cure, were aged over 65).

The belief that powerful others have control over health was far more evident in the non-participant interviews and appears to show some contradiction in the findings. Whilst non-participants were not generally receptive to the advice from powerful others, and did not comply with it, they also believed that powerful others should control their health. This may suggest that non-participants view powerful others as providers of something they expect, such as medication (possibly an external orientation). However, they are not prepared to be controlled by powerful others if the advice involves them taking action themselves in the form of physical activity (possibly both an internal and external orientation). They just want the easy, immediate option, which is for their GP to exert control according to their expectations and decide what medication they receive to cure the problem. Indeed, it could be the case that the internal orientation of non-participants means that they resist accepting information that is different to their own perception of events (as suggested by Phares, 1976). Their external orientation may also lead them to believe they are not capable of activity (i.e. they are helpless) therefore they need the GP to provide the solution for them (as advocated by Lefcourt, 1980). In contrast, participants did not want powerful others to provide the solution to their problems and were willing to take action themselves to control their health (an internal orientation). Yet, at the same time, participants did listen to the advice of powerful others (an external orientation). It is interesting that those non-participants who wanted others to be in control were more likely to be women, or those who worked. This finding may indicate that lack of time due to work means that non-participants feel a sense of helplessness when faced with taking care of their own health. This may be particularly the case for women who work and have family commitments.

7.4.4 Chance health locus of control

CHLC beliefs were present in both the non-participant and participant interviews in very similar ways. However, the most interesting finding is the way in which CHLC

beliefs combined with the other two HLC dimensions. In the non-participant interviews, one woman demonstrated only CHLC. Another woman with a combination of CHLC and PHLC beliefs, wanted others to be in control, received information and advice from her GP but was not open to this advice and believed in cure as opposed to prevention. Neither of these two women initiated activity. In contrast, one non-participant with CHLC beliefs did start activity only to drop out later. He demonstrated a combination of CHLC and IHLC beliefs but was not open to advice. In the participant interviews, all of those who demonstrated CHLC beliefs also had IHLC beliefs. However the two participants who continued with activity beyond the end of the programme also demonstrated PHLC in terms of being open to advice and receiving motivation to exercise from their GP. CHLC beliefs on their own would therefore appear to be negatively associated with initiation of physical activity behaviour, would indicate a lack of control and complement the other two HLC dimensions (as suggested by Wallston, 1992). CHLC beliefs would also appear to be related to an increase in age, since all except one individual who demonstrated CHLC beliefs was aged over 60. Indeed this would support research that suggests that as people age and experience more health problems, they believe their personal power to control their health diminishes (Bell *et al.*, 2002). In addition, women were found to be more likely than men to demonstrate CHLC beliefs, which may indicate their greater susceptibility to certain disorders such as musculoskeletal disease (see Chapter 3). However, the greater incidence of CHLC beliefs in women and older individuals may also support research by Fiske and Taylor (1984). This suggests that women and the elderly, who are unaccustomed to control and have weak expectations of control, may be more likely to respond to loss of control with helplessness. Indeed, feeling helpless has been suggested to be similar to having a chance locus of control orientation (Wallston, 1997).

7.4.5 Summary

The findings show that HLC beliefs help to understand exercise behaviour in individuals who are referred to the ELC. They also support the utility of viewing HLC according to Wallston's typology (Wallston & Wallston, 1981; 1982). In particular, that a combination of PHLC (especially a receptivity to a health message) and IHLC beliefs may be useful for supporting change when individuals are advised to change by a health professionals (see also Chapter 5). Internal beliefs are very

important in both the initiation and maintenance of activity. In particular, when preventive behaviour is attributed internally and seen as controllable, as was the case with participants in this study, behaviour is more likely to be maintained (as advocated by Wallston *et al.*, 1987). However, the findings indicate that IHLC beliefs on their own are not sufficient to enable participants to maintain physical activity in the longer term and that PHLC beliefs have an important role to play in initiation and maintenance of behaviour change. In particular, it is the way in which PHLC beliefs are operationalised that is important in distinguishing between those who do and those who do not change their physical activity behaviour.

Communication from powerful others has a big influence on both initiation and maintenance of physical activity. Individuals are more likely to take part in physical activity if they are receptive to the advice from powerful others and this is communicated in a way that provides good information and motivation. Individuals who merely want to control a powerful other, by obtaining a cure from them, are not likely to change their physical activity behaviour. However, those who are prepared to take part in their own health care by taking action to prevent health problems are most likely to change their physical activity behaviour and to maintain it. This is particularly the case when they believe their actions will result in valued outcomes. The findings also indicated that gender influences physical activity behaviour. In particular that HLC did not fully mediate the influence of gender on the maintenance of activity in the longer term.

This chapter has touched on beliefs about behavioural freedom and how they might influence physical activity behaviour. In particular that adoption or rejection of an opinion or attitude of a powerful other may result in reactance if the opinion or attitude relates to important values and consequences for an individual. It has also touched on beliefs about physical activity in terms of outcomes and beliefs about health in terms of risk and coping with illness. Beliefs are an important influence on physical activity behaviour and are discussed in depth in the next chapter.

Chapter 8

Beliefs about Health and Physical Activity

8.1 Introduction

This chapter is the second domain of the qualitative study. It aims to present the findings from two main themes, beliefs about physical activity and beliefs about health. Within these main themes, seven sub themes emerged. The literature that is relevant to these sub themes is discussed below. It includes self-efficacy; the importance and benefits of physical activity; risks of physical activity; enjoyment and illness representations.

One factor that has been identified as an important predictor of exercise is an individual's self-efficacy beliefs or perception of personal capabilities (Bandura, 1986). It is believed that self-efficacy will affect whether people consider changing their health habits, whether they gather together the motivation or perseverance to succeed and also how well they will maintain any changes (Bandura, 1997). If people do not believe they have what it takes to succeed they may suffer stress, see little point in trying and if they do make an attempt, will give up easily when they encounter setbacks or do not obtain results quickly (Bandura, 1997). Fatigue and aches and pains have been suggested to lead to lower self-efficacy beliefs (Bandura, 1977b). As well as influencing behaviour, efficacy may be reciprocally determined by behaviour, i.e. people may move from low self-efficacy to high self-efficacy as they start to engage in behaviour change (Rothman, 2000). In Rothman's study, successful implementation of behaviour change was found to increase confidence, which in turn facilitated further action, whereas failure experiences undermined feelings of efficacy. However, he concluded that the relationship between self-efficacy and behaviour can not in itself explain why successful changes in behaviour are not maintained over time (Rothman, 2000). Garcia and King (1991) also found evidence to support the concept of reciprocal determinism. In addition, they found that self-efficacy was strongly related to exercise adherence in older, sedentary adults. Other studies have also found that age was negatively related to exercise self-efficacy (Yael & Shulamith, 2004; Wilcox & Storandt, 1996). In older adults self-efficacy has been identified as being instrumental in influencing long-term physical activity maintenance, and to be influenced by social support, past behaviour and enjoyment (McAuley, Jerome, Elavsky, Marquez & Ramsey, 2003). Men have

also been found to be more efficacious than women (Yael & Shulamith, 2004) and to be more confident than women of completing an exercise prescription (Clarke & Eves, 1997).

The perceived importance of physical activity, in an individual's life, has been found to explain 28% of the variance in physical activity behaviour (Laffrey & Isenberg, 2003). The findings from this study suggested that participants did not necessarily rate physical activity to health but to other factors, such as social experience, release of tension or level of achievement. Therefore, if physical activity is performed for reasons other than health, perceived importance becomes a useful predictor of behaviour. This highlights that the view individuals have about the benefits of health related behaviour should be considered when investigating behaviour change. One key benefit of physical activity is that it provides protection from coronary heart disease (CHD) (e.g. Blair, 1994). In fact, physical activity will always have a beneficial effect on health and longevity, regardless of the risk factors for CHD that an individual may possess, (e.g. high blood pressure, high cholesterol diabetes) (Richardson *et al.*, 2004). The Allied Dunbar national fitness survey found that individuals held strong beliefs in the health benefits of exercise (HEA, 1992). However, these beliefs were not associated with their own behaviour and also decreased with age. Beliefs about the outcomes from physical activity have been found to be significantly correlated with physical activity behaviour (Norman, 1995). This study found that a belief that physical activity will promote health is one factor that is required for an individual to perform a behaviour, along with valuing their health and believing they could perform the behaviour (Norman, 1995). One of the expected outcomes, or benefits, to result from physical activity might be weight loss. Inactivity has actually been suggested to be responsible for rising rates of obesity (e.g. Hill & Melanson, 1999). In addition, a much closer relationship has been found between obesity and exercise, than between obesity and diet (Prentice & Jebb, 1995). It has also been shown that improving fitness via physical activity may be more important in reducing cardiovascular risk (especially in women) than reducing overweight or obesity (Wessel *et al.*, 2004). Indeed, regular physical activity attenuates many of the health risks associated with overweight or obesity (Blair & Brodney, 1999).

Whilst increased physical activity will mean less obesity related disease, this health gain may be cancelled out by exercise-related injuries (Marshall & Guskiewicz, 2003). Patients have, for example, reported musculoskeletal problems and cardiac events after participating in physical activity (Giri *et al.*, 1999; Hootman *et al.*, 2002). However, physical activity may actually result in a reduction in injuries from falls in older adults (American Geriatrics Society, 2001). In addition, injury sustained during supervised exercise is rare (Buchner & Coleman, 1994; Timpka *et al.*, 2005). However, individuals have been found to drop out of supervised exercise programmes because they experienced some harm (Eden *et al.*, 2002; Verbunt *et al.*, 2005). In particular, pain was found to have a negative impact on physical activity due to fear of re-injury (Verbunt *et al.*, 2005). In addition, injury has been found to be the most common reason for relapse from exercise (Sallis *et al.*, 1990) and has a strong influence on maintenance or drop out from regular physical activity (Hofstetter *et al.*, 1991). King (2001) found that medical concerns and fear of injury might be particularly important in shaping physical activity patterns for older adults. Individuals at high risk of CHD could also be concerned that physical activity may trigger a heart attack. However, participation in formal cardiac rehabilitation programmes, supervised by qualified and knowledgeable staff has actually been shown to reduce mortality rates (Jolliffe *et al.*, 2002).

One factor that has generally been found to support physical activity participation is enjoyment (HEA, 1992), whereas lack of enjoyment has been found to be a barrier to physical activity (Clarke & Eves, 1997). It has been suggested that enjoyment is more likely to occur when the challenge of the activity matches the skills of the individual (Biddle, 1994). However, if the challenge is not sufficient, boredom will result and if it exceeds the skills of the individual there may be concern about injury. Enjoyment was not found to be a significant predictor of exercise participation in women aged over 60 (Paxton, Browning & O'Connell, 1997). In addition, it did not contribute to the explanation of exercise adherence in older (aged over 50) sedentary individuals (Garcia and King, 1991). A study of women exercisers and non-exercisers found that as the age of the sedentary women increased, so did the belief that exercise was not enjoyable, suggesting that older, sedentary women do not exercise due to a belief that exercise is unpleasant (Wilcox & Storandt, 1996).

However, enjoyment has been found to be important in maintaining exercise participation in younger age groups (e.g. Dishman *et al.*, 1985). In older age groups, enjoyment may be related to the social aspects of physical activity rather than the physical activity itself (Paxton *et al.*, 1997). Social support in the physical activity environment has been found to play an instrumental role in the extent to which older adults perceive the exercise to be enjoyable (McAuley *et al.*, 2003). Enjoyment may also have an influence on self-efficacy. Older exercisers who had positive feeling states as a result of physical activity, were found to be more likely to have increases in their self-efficacy (McAuley *et al.*, 2000). However, it has been suggested that enjoyment may not influence adherence if participants join a study voluntarily, and therefore, already believe health is important (Garcia & King, 1991). It is, therefore, possible that participants' health motives, commitment and support from a programme means that enjoyment may not have an opportunity to influence adherence.

Another factor that has been found to vary by age, and also gender, is the way in which individuals cope with their health problems. Through their increasing range of life experiences, people may learn enhanced coping skills (Leventhal *et al.*, 1993) therefore, older people may be better at coping with difficulties (Aldwin, 1991). Men appear to make more use of avoidance coping, whereas women are more likely to use more vigilance strategies (Weidner & Collins, 1993). Coping has been defined as, efforts to create and maintain desired conditions (or self-regulation) under adversity (Carver & Scheier, 2002). According to Cohen and Lazarus (1979) coping efforts will centre on five main tasks, reducing harmful environment conditions and enhancing recovery prospects, tolerating or adjusting to negative events or realities, maintaining a positive self image, maintaining emotional equilibrium and continuing satisfying relationships with others. Coping strategies may include problem-focused, emotion-focused, avoidance-focused and acceptance-focused (Carver, Scheier & Weintraub, 1989). However, coping styles could simply be viewed as avoidance versus confrontation (or active/vigilant) coping (Taylor, S., 1999). The strategy/style of coping that is used may depend upon the stress situation that people have to cope with (Krohne, 1993). Researchers have suggested that one feature of coping is its situational specificity (e.g. Lazarus & Folkman, 1984; Leventhal *et al.*, 1993). The strategy/style may also depend on an individual's

disposition (Carver *et al.*, 1989). Krohne (1993) concluded that vigilance and cognitive avoidance are separate personality dimensions that describe the intake of aversive information, as well as being processes that determine the short-term and long-term effects of this information. Individuals with a preference for vigilance are suggested to be intolerant of uncertainty whereas, those who use avoidance are intolerant of emotional arousal. If individuals are intolerant of both uncertainty and emotional arousal, Krohne (1993) suggests they will become preoccupied with threats, and overwhelmed by emotion. This will lead to coping that is short term and fluctuating, with a tendency to give up early rather than wait to see if a strategy has been effective. However, those who have a high tolerance of both uncertainty and emotional arousal can cope well in aversive situations and pursue a strategy long enough to see if it is effective or not (they will adapt behaviour to the demands of the situation). It has been suggested that individuals will use different coping procedures, in a flexible way, based on their interaction with the environment. Problem solving coping (adapting behaviour) along with acceptance focused coping (altering perceptions of themselves and their illness), have been used by people who have suffered a heart attack (Lowe, Norman & Bennett, 2000). Some types of coping are more effective in certain situations. Avoidance coping has, for example, been found to be a successful way of coping with short-term threats but not long-term or persistent ones (Taylor, S., 1999). However, according to Carver and Scheier (2002) avoidance coping might appear to be an intention to avoid acknowledging that a problem exists and may seem to be prompted by doubts about being able to deal effectively with the problem. Exercise has been found to be used as a coping strategy and also to be correlated with problem focused coping (Ingledeew *et al.*, 1996). Coping research is useful in helping to understand physical activity behaviour. In fact, it has been proposed that phenomenological data such as attitudes and procedures (or coping responses) can be used as process variables in psychological models (Leventhal, *et al.*, 1997). Procedures are linked to the definition (representation) of the problem and also to a set of beliefs specific both to the class (e.g. physical activity beliefs) and specific type (e.g. walking/gym related physical activity).

The way in which individuals cope with a health problem is influenced by their representation (or beliefs) about the illness (Leventhal *et al.*, 1992). The

representations have a number of attributes, one of which is the presence of a health threat (or its label/identity and symptoms). In their self-regulatory model Leventhal *et al.* (1992) suggest that the selection of a coping procedure (e.g. to participate in physical activity) is determined by beliefs about the nature of the illness threat. Others have also found that fear of disease and susceptibility to disease enhanced health concern, which in turn determined attitude and practices (Latha & Suresh, 2002). One other attribute of illness representation is how it is perceived to affect the individual (or its consequences). It has been suggested that individuals weigh options and consider the consequences before they respond to a threat (Lazarus & Folkman, 1984). Another attribute of illness representations is 'controllability' or beliefs about whether the threat can be controlled/cured (Leventhal *et al.*, 1992). In their review of chronic illness, Carver and Scheier (2002) suggest that individual differences in expectancies are an important influence on how people cope under adversity (such as when coping with chronic illness which represents a threat to ongoing life). They proposed that if people expect to succeed they will keep trying but if they believe success is out of reach, they will give up. Others have also put forwards this proposition. In particular, in their review of coping with chronic illness, Petrie & Moss-Morris (1997) note that coping responses are determined by two factors. These are the appraisal of the degree of threat posed by the illness and the resources perceived to be available to help cope with the situation. However, they found that it is the individuals own subjective understanding of the illness the may be the key factor in directing the coping response, rather than the severity and nature of the disease.

8.2 Method

The qualitative methodology is set out in Chapter 6. This includes recruitment of the sample, sample demographics, data collection and analysis. A summary of the profile of study participants is also shown in Chapter 7 (Table 7.1). In line with Grounded theory methodology, data was coded following careful reading and re-reading of the transcripts. The codes were initially categorised in to similar groupings, to form fifteen key themes (See Chapter 6, Table 6.2). Following a close examination of all of the key themes, five of them were brought together to form the beliefs domain. These were attitudes, beliefs, feelings, health perceptions and self-efficacy. The codes within the five themes were then re-analysed into those that

related to physical activity and those that related to health, to form two main themes (beliefs about physical activity and beliefs about health). The codes within each of these two themes were then examined to identify similar groupings of codes. Seven sub themes emerged from this process. Within each sub theme there were numerous features, both positive and negative (Table 8.1).

Table 8.1

Themes, sub themes and features of the beliefs domain

Themes	Sub theme	Features
Beliefs about physical activity	Self-efficacy	How capability to take part in activity was talked about, including: mobility, physical and psychological capability, change in perceived capability and perseverance.
	Importance of physical activity	Narratives about the importance of physical activity and its relationship to other factors (e.g. work, family, caring). How the importance of physical activity was talked about in terms of helping to achieve valued benefits.
	Benefits of physical activity	Perceived benefits of physical activity, physical, psychological and general.
	Risk perceptions	Perceptions about the costs/risks of physical activity, including physical and psychological harm.
	Enjoyment	How participants talked about enjoyment, from physical activity, from people and from competition.
Beliefs about health	Health perceptions	Narratives about how study participants perceive their own health, (both positive & negative).
	Health concerns	Study participants concerns about their health and beliefs about it being at risk.

8.3 Results

8.3.1 Introduction

The same two main themes and the seven sub-themes within them were present in both the non-participant and participant interviews. However, the features within them varied or were operationalised in different ways. The findings from the non-participant interviews are presented first (Section 8.3.2). The beliefs about physical activity theme is divided into five parts, corresponding to the five sub-themes (self-efficacy, importance of physical activity, benefits of physical activity, risk

perceptions and enjoyment). For each sub-theme, the features within them are presented (Section 8.3.2.1). The second main theme in the non-participant interviews is beliefs about health. It includes two sub-themes (health perceptions and health concerns). These sub-themes and their associated features are presented in Section 8.3.2.2. The findings from the participant interviews follow the same format as the non-participant results (Section 8.3.3). Each narrative or answer is followed by a reference in brackets (for an explanation see 7.3.1).

8.3.2 Non-participants

8.3.2.1 Beliefs about physical activity

Self-efficacy

Three quarters of non-participants made a negative assessment of their capability to take part in physical activity (n=12). Within this sub theme, three key features emerged from the non-participant interviews. The first was that non-participants spoke about how they had problems with mobility (n=10). Of those with mobility problems, many did not start any activity (n=8). One man for example spoke about his knee and said:

It is getting a bit dodgy at the moment. I go for a walk with the wife and err, me knee tends to give in sometimes. And the apparatus would give me trouble. (P3/M/70/ns)

This non-participant did not believe that he would be physically able to participate in the programme. He assumed he would have to work on 'apparatus' which he felt unable to do. Like many other non-participants who talked about problems with their mobility, he suffered from arthritis (n=6). For many of them, the arthritis was associated with pain as one non-participant explained:

The pain, there was nothing they could do for a short while, then it just so immobilises you and you stop in you see. (P7/F/71/ns)

The majority of those who spoke about problems with pain and mobility also expressed doubt about their physical capability to exercise (n=9). This was the second feature to emerge from the non-participant interviews. The interview of one non-participant kept returning to doubts about her capability to exercise as follows:

I would I would Scottish dance. You know I'm a Scottish dancer normally and I would do it if I could...I'm finding it quite difficult to walk actually...let

alone walk to exercises... You know I don't honestly think I could swim because I don't think I could do the scissors movement. (P1/F/50/ns)

Her answer shows that, due to her mobility problems, she does not believe she has the physical capability to exercise. Other non-participants doubted that they would be psychologically able to participate in physical activity (n=5). In some instances this was combined with a belief in lack of physical capability and/or mobility problems (n=9). One non-participant described how she doubted both her psychological and physical capability to take part in the programme:

I haven't got the confidence to do the exercise I put me self in for that because I didn't think you know you just feel Oh I can't face going to a gym I can't face going for a swim and things like that. I just feel totally shattered all of the time errm that's the only thing that's put me off it just I haven't physically felt like doing it, even though in my mind I want to do it, I've just felt tired all the time. (P5/F/29/do)

Whilst she does not suffer from mobility problems, she has low self-efficacy with respect to exercise. Like wise another non-participant who did not suffer mobility problems described how when he started on the programme he did not believe he was capable, yet felt he wanted to give it a go:

I was very down and one of the problems with depression is loss of, what's the word. Motivation. And there are lots of things I want to do but few things that I actually do...I was also very, very, very out of condition...and I wasn't sure how I'd cope with any sort of exercise anyway. (P30/M/55/do)

In contrast, three non-participants who spoke about mobility problems and pain did believe they were capable of taking part in exercise (n=3). One woman felt capable but did not believe it would do her any good. This is discussed in more detail in the benefits sub-theme. One woman with back problems and depression felt able to exercise, although her GP had expressed doubt that she could (see the powerful others theme Chapter 7). One man was unable to walk due to pain in his foot yet still believed he would be able to swim on the programme. He found an easier solution to his problem and therefore did not start the programme (this was discussed in Chapter 7).

The examples in this sub-theme illustrate that for many non-participants, mobility problems, pain and arthritis effect their beliefs about capability to participate in

physical activity. These characteristics were most likely to be present in those who were over 65 and not working. In addition, their answers show how a small number of non-participants may initiate activity even when they doubt their capability.

As part of this sub-theme, it is particularly interesting to look at the profile of those non-participants who did not show evidence of a lack of belief in their capability, either in terms of mobility, physical or psychological capability (n=4). All of these non-participants were working when they were referred to the programme, three men and one woman.

Importance of physical activity.

Another sub theme to emerge from the non-participant interviews was importance of physical activity (n=12). Non-participants only spoke about this in a negative way. They referred to the importance of physical activity in relation to the other commitments they had in their lives (n=8). In particular, many believed that their other commitments were more important than physical activity and that for them to do any activity, it would have to fit in with these (n=6). In all of these cases, the commitment was work and non-participants said for example:

Trying to work round some of my shifts, I thought I don't know how I'm going to do it. (P22/F/60/ns)

And:

It's all down to time with me and it is a very, err, time consuming job I do. (P6/M/56/do)

In addition to work commitments, two of the male non-participants had family to care for. One who was a single parent and worked part time explained:

It was a bit of a rush trying to get everything sorted with me daughter and everything before I went out. (P19/M/44/do)

This man started activity only to drop out shortly afterwards, which was also the case with others who believed that work affects the importance of physical activity in their lives (n=4). However, for another two non-participants, who were not working, it was the need to avoid commitments that made physical activity unimportant to them (n=2). One woman said:

I think you have got to be in the right frame of mind, haven't you, to do anything like that, to join anywhere. I mean I don't want commitments, I want to be able to say oh no well, I won't bother any more. (P4/F/71/ns)

And one man said:

I could say I'll go and when the time comes, I could be in one of them moods again, where I just, it's not intended, It's just the way I feel sometimes. (P13/M/61/ns)

Neither of these non-participants started activity on the programme. Their responses suggest that they do not like to plan the use of their time in advance, therefore, a twelve week commitment to participate in the programme was too long for them. Time perspectives are covered in Chapter 9.

Another feature that emerged from this sub theme was a belief that diet was more important than physical activity in helping to achieve valued outcomes (n=5). All except one of these non-participants worked full time therefore, work appears to be an important influence on this belief. The answer of one non-participant, for example, shows that he had not even considered physical activity as an option:

I wanted a dietician to be truthful...as far as I was concerned, I was just trying to err, look at things, you know to err lose a bit of weight. (P9/M/56/ns)

In addition, another man said he was:

...more interested in finding out what level to reduce my saturate intake. (P6/M/51/do)

The implication from this quote is that he believed changing his diet was the best solution for his high cholesterol and not physical activity. Like the other non-participants, who talked about diet being important, he worked full time. The non-participants may have therefore believed that physical activity was the more difficult and time-consuming option to fit into their busy lives. Taking the easy option is explored in more detail in the Time domain (Chapter 9).

A belief that physical activity is something that is enforced due to circumstances was another feature to emerge from the non-participant interviews (n=4). Non-participants spoke about how they walked because they were unable to drive. Each of them were women and one explained how:

I do a lot of walking...I think it's the way I sort of, I mean, I get the bus and the train and walk everywhere. I don't drive you see. (P5/F/29/do)

The implication in her words is that if she did drive, she would not do the level of walking she currently does.

The final feature to emerge from the non-participant interviews was a need to be selfish in order to exercise (n=1). This involved putting the importance of your self above that of others. Whilst this was only present in one non-participant interview, it highlights that a focus on family and caring responsibilities affects how important physical activity is to individuals. It is shown in the narrative of a man whose wife had died since he participated in the programme. He described how:

I'd been on the nursing situation night and day like you know, and it's pretty tough, but it's my responsibility, she's my wife, I love her...I did it for about eighteen months. I had a carer coming in the morning you know for an hour. It leaves you free to recoup a little. This was all going on you see, at the same time as I was doing the exercise. I couldn't concentrate on that, whereas now, I can fix up a rota. Well with a little bit more determination and be a bit selfish and think about myself now, can't I. (P27/M/78/do)

His narrative highlights how caring was the most important part of his life at the time he was attempting to become more active and how he believed he was being selfish by exercising. Therefore, physical activity was not important to him and he did not complete the programme. It also shows how individuals need to attempt behaviour change at the right point in time for them. In addition, it highlights that the outcome of an attempt to become more active depends upon non-participants interaction with other people in their lives.

Benefits

Many of the non-participants spoke about the benefits which they believed result from physical activity (n=11). There were three distinct features to this, namely physical benefits (n=6), psychological benefits (n=3) and general benefits (n=7). Some non-participants spoke about more than one benefit.

Non-participants spoke about the physical benefits of exercise in the context of weight loss (n=5). One woman said her GP wanted her to exercise and:

..thought it would be a good idea and I suppose he's just a slim line person who takes a lot of exercise. (P1/F/50/ns)

Her words suggest a belief that her GP is slim because he takes a lot of exercise and that weight loss was his idea not hers. Another non-participant who also never started activity said:

With being more idle now, I have put on a bit of weight. (P3/M/70/ns)

These two examples show that non-participants made the connection between physical activity and weight loss. One other woman said:

Hopefully it will help me weight, which will probably help me mood and how I feel about myself and me confidence. (P5/F/29/do)

Her reason for exercising shows how non-participants believed physical activity would help their psychological well being (n=3). One other non-participant explained:

I have got the depression, which has, is getting worse. I've had to retire because of it. Err, and I thought that getting fitter, getting healthier again, getting fitter again, would help at least a little bit. (P30/M/55/do)

Each of the non-participants who believed physical activity would help their psychological health started on the programme, only to drop out soon after. This indicates that psychological health has an impact on adherence to physical activity.

In terms of general benefits, non-participants believed physical activity makes you feel better (n=4). Non-participants explained for example:

I felt better when I was doing physical activity. (P30/M/55/do)

And:

I've always done exercise and I've felt much better. (P7/F/71/ns)

They also believed that physical activity makes you healthier (n=3). One man for example said:

Keeping fit and health run together. I think it keeps your heart good and your lungs good and everything doesn't it. (P27/M/78/do)

In addition, they believed it is good for you, (n=2) and may prevent illness (n=1).

One woman said:

Well I already know it is very good for you. (P12/F/50/ns)

And one other said:

I also thought if I did exercise, perhaps I wouldn't get ill as much as I do.

(P17/F/54/do)

One non-participant summed up his belief in the benefits of activity as follows:

I think it runs together doesn't it, health and physical activity. Err, physical activity, get your body fit, if your minds good, you have a healthy life.

(P30/M/78/do)

Whilst the majority of non-participants acknowledged that physical activity is beneficial for health, only a few of these talked about what specific benefits they thought they may achieve from attending the programme (n=4). The non-participants who spoke about benefits from attending the programme did initiate activity but had dropped out prior to being interviewed. They used the word "I" in the context of "I wanted" or "I thought" and then followed this with positive benefits such as weight loss, fitness, mobility and feeling better, for example:

I wanted to lose weight. (P27/M/78/do)

I was keen to get fitter. (P19/M/44/do)

I thought it would sort me back out. (P17/F/54/do)

In contrast, those who never started on the programme were more likely to talk about their referrer wanting them to do physical activity. They used words such as "she thought" and "I'm supposed to". In addition, their answers suggest they were not convinced that benefits would result from participating in the programme. This was illustrated by their use of words such as "might" and "possibly", for example:

She thought it might help me get fit. (P12/F/50/ns)

I'm alright really...but I'm supposed to lose weight. (P13/M/61/ns)

I should imagine it would possibly help. (P3/M/70/ns)

Other non-participants who did not start on the programme were more direct in articulating that they did not believe exercise on the programme would benefit their health and said:

I've just got to resign myself and I don't think the exercises will help me.

(P7/F/71/ns)

And:

I thought but I'm going to a gym and I should have just come and got on with it, you know, and think and say, well I don't really think its going to work.

(P22/F/60/ns)

A belief that physical activity on the programme would be of benefit to their health was, therefore, an important factor that distinguished between the two groups of non-participants. It was those who believed they would benefit who were prepared to start the programme. However, for one non-participant, even when valued health benefits were realised, this was not sufficient for her to complete the programme. She explained:

In the gym you feel as if something is happening. You know when I went in there and I went on that machine for my back, I really felt as if my back had been stretched... When I was going, I thought to myself, me back is so much better. (P17/F/54/do)

However, other non-participants who had started the programme, did not talk about any benefits they had obtained from activity on the programme. This may have been because they did not attend for a sufficient amount of time, or because they had unrealistic expectations about how quickly they would see benefits. In some instances, the exercise environment may have contributed to non-participants short time on the programme (n=3). All of these were men who did not continue with physical activity long enough to realise benefits due to having problems with the exercise environment. One man said:

It wasn't until I started that I realised that it, err perhaps wasn't quite my sort of, my scene if you like. (P30/M/55/do)

One other said:

Because it was in the gym, err you know there was no communal sort of feel about the place...so I ended up, sort of I went begrudgingly. (P19/M/44/do)

Both men focused on the negative aspects of their experience of the programme, in particular that the exercise environment was not enjoyable for them. This is discussed in more detail in the enjoyment sub theme (see later).

Risk perceptions (physical activity)

A number of non-participants voiced concerns about physical activity doing more harm than good (n=7). Some of these spoke about physical harm (n=4). This related for example to concern about harm to their back, legs, knees, and hips. One man said:

I told them that I had problems with my back as well so they kept me off certain machines. Erm when I was on me own working out I would actually

have a go on things for me back. Even thought I wasn't probably supposed to because I might have done myself some damage but I thought well just try them because you have to exercise your back even though its damaged.

(P19/M/44/do)

One other man said:

Swimming would have helped you know, but not going down those steps. You only slip and bang you legs and make yourself worse. (P27/M/78/do)

And a woman explained that:

It was decided that really at some point I'm going to need to have a knee replaced so on and because I then eased off a lot of the exercise that I was doing. erm because between working and being on the wards all night and one thing or another I found I didn't really want to put too much pressure on the knee. (P22/F/60/ns)

In addition, one woman with arthritis in her hip explained how:

...sometimes you jump up to push yourself and then it'll do it right or wrong, it's just in the air isn't it, I just don't want to be doing like for doing wrong.

(P7/F/71/ns)

She felt that:

With regards to exercise, I'll try them as long as they can let me in and I'm not going to do any more harm. (P7/F/71/ns)

Some non-participants were worried about experiencing negative psychological feelings as a result of participating in physical activity (n=4). Two of them, for example, felt attending the leisure centre may harm their psychological well being.

One said:

But I knew that probably that if you take it overall erm my psyche was more important than arriving at the Oval and finding that I couldn't get to where the appointment was and being embarrassed. (P12/F/50/ns)

And the other said:

Too many people know me and I'd be skitted (made fun of) left right and centre. (P13/M/53/ns)

Whilst these two non-participants did not go to the leisure centre, because it may result in negative emotions for them, two other non-participants felt uncomfortable with certain types of physical activity. One said:

I felt silly in the warm up exercises. The adviser said, just get on the bike and go slow, so I did that instead of other stuff which would have made me feel silly. (P17/F/54/do)

And the other one said:

My physical shape stopped me doing something like going in the swimming baths and stuff like that, because I'm not confident about the way I look. (P19/M/44/do)

These two non-participants both did something they felt comfortable with however, did not complete the programme. However, one of them was also concerned about doing some harm to his back and the other had been warned by her GP that exercise may do her back more harm than good. Both of them suffered from depression.

Enjoyment

When they were asked how they felt about physical activity, many of the non-participants spoke about enjoyment (n=10). A number of them believed that in order to initiate and maintain physical activity, it has to be enjoyable (n=4). Examples of this are shown in the interviews from two women. One said:

I was feeling as though I was being pushed into something that I wasn't going to enjoy. (P22/F/60/ns)

And the other one said:

After working all day, sometimes you don't want to go out and do exercises, but, so I need to find something that I'm going to enjoy and keep at. (P2/F/27/do)

The first woman believed she was not going to enjoy physical activity on the programme and therefore never started. Whereas the second example highlights how work affects physical activity and also how enjoyment is important to maintain activity. One other non-participant explained that he did not maintain activity due to lack of enjoyment and that:

I was finding excuses not to go because I found the gym boring basically...I think if it had been a bit more enjoyable, a bit more fun... (P19/M/44/do)

Whilst enjoyment of the activity was an important incentive for him to continue, he also said that:

I did enjoy the fact that I had, you know, I had the weeks, the adviser was ringing up to say come down and I was getting pushed to go down, but once I

actually got in there it wasn't what I'd conceived if you like. But I enjoyed the err, I mean I spoke you know, talking to other people. (P19/M/44/do)

His answer shows that other people influence the enjoyment of physical activity. A number of non-participants said how they enjoyed being with people (n=4). One woman explained that:

I thought it would sort me back out, it would be good. Plus the fact getting out and seeing other people you know, which is good. (P17/F/54/do)

Some non-participants particularly enjoyed being with other people and participating in competitive activity (n=4). These were all men who, for example, when asked how they felt about physical activity said:

All the exercise I had taken before had been competitive, had to have a point to it...You win or lose. I found sitting on a bike and gazing in the middle distance and err, all the other things I did, not at all worth, didn't satisfy me at all...I couldn't get in to them because there was no immediate end product. (P30/M/55/do)

And:

I enjoy it. I enjoy competitive, you know like ball games. I do it because I enjoy it on the football, I don't do it to keep myself physically fit, that doesn't err register as part of the incentive to do it. (P6/M/51/do)

Each of these examples shows that the men gained satisfaction from competitive activity and obtained no enjoyment from the activity on offer through the programme. A number of other non-participants said how they particularly enjoyed walking (n=4) and said:

I rather like exercise of some description, and we quite often go for a walk, the wife and I. (P3/M/70/ns)

I do walk a lot. So I do enjoy walking when I can. (P4/F/71/ns)

The responses from these non-participants show how the type of physical activity is an important factor contributing towards its enjoyment.

8.3.2.2 Beliefs about health

Health perception

Half of the non-participants described their health condition in a positive way (n=8). They used words such as marvellous, very good, quite good, all right, fine, fairly fit and not bad. One woman for example, said that:

In general, I feel marvellous in mind and body, absolutely marvellous.

(P4/F/71/ns)

Some non-participants described their health positively in context of their medical problems, for example one man described his health as:

Good, very good. I don't have a problem, just overweight. (P9/M/56/ns)

Another woman explained:

Although I am actually disabled, I am incredibly healthy as such. You understand what I mean if this is a contradiction in terms in people's heads. But actually health wise, do you understand what I mean, my health is actually very good. (P12/F/50/ns)

Likewise, another woman said that her health was:

Fine, err well apart from being tired and stuff. (P2/F/27/do)

Whilst one man said:

Well actually, health wise I was alright as far as I was aware. I'm on disability, I've got arthritis in my knees, back and neck. Neck and back is not too bad, its just the knees. But generally I was OK yeh...I think I'm fairly fit. (P13/M/53/ns).

Most of those non-participants who felt positive about their health did not start any physical activity.

Non-participants also described their health in negative ways (n=5). They used the words bad, ill, and unfit. One woman explained that she had one hip replacement and that the other one was:

..pretty bad at the moment...and I'm finding it quite difficult to walk actually. (P1/F/50/ns)

One woman believed she was really ill and said:

What can you do when you are really ill. The pain...it just immobilises you and you stop in. (P7/F/71/ns)

Whilst these two non-participants never started any activity on the programme, three of those who felt negative about their health did attempt activity, only to drop out shortly afterwards. One of them described how he:

..went to doctors complaining of being out of breath, being, I felt, as if I had high blood pressure. Err, I just felt totally unfit. (P19/M/44/do)

In addition to describing their health in both positive and negative ways, some non-participants did not directly make an assessment of their health (n=3). When asked how their health was when they were referred to the programme, they spoke only about their problems. One of them said:

Well, I'm having trouble with me knees and of course joints you know.
(P27/M/78/do)

One other said:

I just feel totally shattered all of the time...and I don't think there's anything medically stuff that's wrong with me. (P5/F/29/do)

And the other said:

I've got a lot of old age complaints...me heart now seems smashing, you know, I don't have any trouble with pain. (P3/M/70/ns)

Although non-participants described their health both in negative and positive ways, these descriptions did not convey whether they believed their condition was acute (short term) or chronic (long-term). The majority of non-participants believed that their health condition was acute (n=13), that is it was short-term in duration and therefore not a serious threat to their long-term health. However, in contrast to this, some non-participants did believe their condition was chronic (n=3) and longer-term in duration. These findings are discussed in the Time domain (Chapter 9).

Health concerns

Many of the non-participants indicated that they were not particularly concerned about their health conditions (n=12). There were two features to this. The first was talking about how they accepted their problem (n=9). One example of this was that they talked about accepting an increase in weight and said:

I seem to be accepting and putting on weight gradually and I'm thinking Oh, you know, its only a couple of pounds, and before you know its like two and a half stone. (P2/F/27/do)

And:

I have never been big, but I'm getting bigger and bigger. It is very disturbing. But then again, it doesn't worry me that much because if there is a bar of chocolate going or a bag of sweets, I eat it. (P17/F/54/do)

Another example was that they talked about the problem being something they had accepted as part of their normal lives in terms of:

I've had it for years...it's just something you live with. (P7/F/71/ns)

I can't be cured. (P12/F/50/ns)

These non-participants believe their situation is uncontrollable and therefore have adopted an avoidance strategy in order to deal with it. This would have enabled them to accept their health problem and therefore, provide a reason to avoid doing anything about it.

The second feature was dismissing problems as insignificant (n=7), as the narratives of the following non-participants illustrate when they say:

I don't think there's any thing medically stuff that's wrong with me.

(P5/F/29/do)

And:

With me legs aching and that, well it was me knee joints. But let them hurt, I don't care (laughter), I'm stark raving mad really. (P27/M/78/do)

The last man's response was typical of a number of other men with knee problems (n=3). One of them said he tried not to do any activity because:

It does me knees in you see. (P13/M/61/ns)

The other man who had problems with his knees and also his heart explained how:

Me heart got worse than me knee (laughter), so the Doctor said you are better to see about your heart...forget your knee (laughter). So I have never done anything about it since...me heart now seem smashing. (P3/M/70/ns)

This man had a triple heart bypass that he believed had solved his heart problem therefore, he did not perceive this to be an issue for him any longer.

Both men and women were equally likely not to express concern about their health. However, those who never started on the programme were the group most likely to talk about not being concerned about their health.

8.3.3 Participants

8.3.3.1 Beliefs about physical activity

Self-efficacy

Less than half of the participants voiced concern about their capability to participate in physical activity (n=7). They did this in a number of ways. Some expressed doubt about their mobility and were concerned that pain may prevent them from exercising (n=2). These two women for example said:

I supposed I really expected the usual, for me to manage exercise for 4 to 5 weeks and I'd hit a huge pain barrier. And not be able to finish. And that was really what I was expecting to happen, to be perfectly honest. And I did hit it, I did hit it. But I wouldn't give up and I wouldn't let the advisor give up on me either (laugh), I said, so don't give up on me, can we work through this, so I don't give up. (P28/F/50/c)

And:

I thought that it was going to be far too painful. But as I've worked at it and you know, my joints have loosened and the swelling has gone down, its actually helped rather than hindered. (P15/F/64/c)

These narratives highlight how self-efficacy changed over time as participants did more activity. This feature was present in many of the participant interviews (n=6).

One of these participants explained how she coped with pain as follows:

I managed the real wall of pain. For about four weeks I was really bad...so then back on the horse again. So it made me realise I could do it, it wasn't a failure to come down. Yes, still go on the bike, but don't do as much, drop your level. (P28/F/50/c)

These examples show how perseverance and realistic beliefs about what can be achieved, combined with seeing benefits from physical activity, contribute to a change in self-efficacy.

Other participants also expressed concern about their physical capability to participate in the programme (n=3). Two of these were women. One of them explained that her concern was:

Well, whether I was capable of doing it. When I walked in I said oh my god (under her breath). You know. People on the bike as if they were going up a mountain, Oh I said my god, I'll never be able to do that. (P26/F/69/s)

However, the adviser told her that these were people experienced in exercising and she would not have to do the same as them. She then described how she was:

..quite pleased with meself, what I did really...and actually we got confidence after a bit and I could stay on a bit longer and go a bit faster. (P26/F/69/s)

One man also described how:

After the first day I thought sod this. I didn't think I was gonna do it, it was that hard. Well to me it was hard. And err, the sweat just pored out of me,

unfit. And I thought Oh no, this is no good, it's gonna kill me this. But as I say, the people round you saying, go on, you can do it. (P34/M/61/c)

With this encouragement from others he gradually built up his level of exercise and felt that he was achieving some benefit from the activity.

Other participants lacked belief in their psychological capability to exercise and used the word 'frightened' to describe how they felt about initiating activity (n=2). One woman said:

At first I was frightened, any time when I have to go some where first I always (laughter). I always get a bit worked up you know. Err, feel, I feel funny, get all hot and that you know. Shakey and that. But once I get there and start I'm alright. (P29/F/55/s)

The other woman said:

I said to her that I wouldn't be able to do the gym because of me eyesight....I just kept panicking, saying, I won't be able to do it, I won't be able to do it you know. And you know, what if I fall, every thing was just going through me mind you know, what if, what if, what if. But I think in the beginning yes, I was frightened to death of it. I was, more so because of me eyesight. (P24/F/47/c)

Whilst they expressed doubt about their self-efficacy, they were also determined to persevere in order to achieve benefits which were of value to them. One said:

I was determined to do it not only that because I had to lose the weight and that you know. So I was, once I put me mind to it that's it I'm determined to go through it even if really hurt. (P29/F/55/s)

The other one said:

I thought I have to do something and no body else can do it only me. Lots of things were going through me mind and I thought I can do it. You know I'm going to do it and this is what I kept telling myself every day. (P24/F/47/c)

Both women persevered because they wanted to lose weight. The first because she wanted to comply with her GP's instructions and the second because she feared death. The first woman explained why she persevered with the activity and how her self-efficacy changed:

It hurt at first and that, and then I got used to it, it weren't too bad...well I expected it because I hadn't been doing that kind of exercise for years...me

second week, it weren't too bad and as time got on, it got better and better.
(P29/F/55/s)

These examples are two of a number of participants who demonstrated the ability to persevere with activity (n=6).

Most participants who doubted their self-efficacy at the beginning of the programme changed these perceptions over time. However, one participant who believed she was capable of participating in physical activity when starting on the programme, doubted her self-efficacy as time progressed and said:

Erm and I really thought at that point that I could do it. And I just, I don't know after how many weeks, I just, just messed with it and I just thought why are you doing this, your just sabotaging every thing you try to do. And then because you get in the spiral of I can't do it, oh you're just like sort of naughty if you like, oh you're just naughty. I just can't do it. (P33/F/37/s)

Whilst this was an exception to the findings from other participant interviews, it is an example of a working woman who struggled to cope with conflicting demands on her time and an eating disorder.

The majority of participants did not voice concerns about their ability to take part in the programme (n=9). Of these participants, three did not continue beyond the end of the programme. Those who believed they were capable of participating in physical activity on the programme were mainly men (n=7). One of them said:

I always believe I am able to do it...I wouldn't have started it if I didn't think I could achieve the goals. It doesn't mean to say that I always achieve my goals, sometimes I fall flat on me face, but it doesn't stop me from re grouping. (P8/M/49/c)

His response shows a belief in his ability and in addition that he has capability to persevere if he meets set backs. Other participants who had no doubt about their capability to exercise mentioned how they had found it easier as time progressed (n=4) and said, for example:

I was actually quite good, I could set me self certain things and I could stick to them quite comfortably without killing myself...when I was there I didn't put myself through pain or anything like that. (P10/M/61/s)

And:

I start going every day and it seems to get easier and easier you know as me fitness was getting better...I just said to myself, I'd got to improve, you know, me fitness will improve. (P11/M/53/s)

These examples also show how it is important that the activities were within participants' capabilities and that they are realistic about the level of activity they are able to achieve. They also show that as participants persevered, they gradually found that activity became easier.

Importance of physical activity.

One of the sub themes to emerge from the participant interviews was importance of physical activity (n=7). This was also present in the non-participant interviews. Some participants talked about the relative importance of physical activity in their lives in a negative way (n=3). Two women believed that other commitments are more important than physical activity. One said:

Work took up more of me time again. Immediately there was this conflict there. And although I was allowing myself, I was making time on a Monday, it was a lot of pressure to get straight from work to shoot to the gym. It was pressure and I wanted it to be a relaxing experience...I've got to rush straight from work and then I've got to rush straight to school. (P33/F/37/s)

And the other said:

It was a hell of a rush...give me husband his dinner, jump in the car...you know the day is too rushed. You know when you are doing meals and you've got shopping to do and it's alright when you are on your own, you can please yourself. (P26/F/69/s)

Both women had family responsibilities and found it difficult to juggle the competing demands on their time. They had to prioritise the different demands on their time and along with another woman believed that in order to fit physical activity in to their schedules, they needed to be selfish (n=3). Their narratives highlight why physical activity was not viewed as important as other things when they say for example:

It's alright when you are on your own. (P26/F/69/s)

And:

I put me Wednesday morning as me exercise. I called it me morning to meself, without doing work, cause more or less I've got things day to day...like Monday I iron, mop the floor, vac up... (P29/F/55/s)

And:

If I could stay at home full time, I would know, I would allocate some time for myself to go to the gym...but I would still have enough time to do the things I need to do for the family. It's hard to give myself time and the time I do give myself is split between having to watch tele (laughter) and I do like exercise but its sort of, it's a lot of effort and I find that hard. (P33/F/37/s)

Although each of these women completed the programme they did not maintain activity beyond the end of the twelve weeks. They indicate that it was difficult for them to fit physical activity around their other commitments and that rather than being enjoyable, it became a chore for them.

In contrast, a number of other participants talked about physical activity not being a chore (n=4) and, therefore, viewed its importance in their lives in a positive way.

They said for example:

I just don't find it a chore. (P15/F/64/c)

And:

A sense of well being and a sense of energy from exercising for me is like a real buzz...it's not something I've ever felt as being a chore to do.

(P28/F/50/c)

Although three of these participants were women, two of them had no family commitments and were able to please themselves in how they used their time. All of those participants who did not view physical activity as a chore continued with their activity beyond the end of the programme.

There was one unusual example (who has also been mentioned in the self-efficacy sub theme) of a participant who, like a number of non-participants believed diet was a better option for her than physical activity. She said:

I've done so many faddy diets and I'm trying the last few...I've got fixed ideas about me weight, sometimes the exercise gets a bit mixed up with that.

(P33/F/37/s)

This woman was working part time and had three young children. She therefore found it difficult to fit physical activity in to her life. However, she also had a history of eating disorder and therefore found her weight problem confusing in terms of whether it was best to diet or exercise.

Benefits

Many participants believed that physical activity was beneficial for health (n=12). As in the non-participant interviews, three main features emerged from this sub theme. Firstly, participants believed physical activity is beneficial for physical health (n=4), secondly, for psychological health (n=3) and thirdly, for health in general (n=9).

Those participants who spoke about physical benefits made reference to activity resulting in weight loss (n=4). Some also believed that weight loss would improve mobility (n=2). One woman for example said:

For those people who are overweight, the exercise helps. (P25/F/72/s)

And the other one said:

I immediately link in exercise with weight. (P33/F/37/s)

The first of these women was not overweight and attended to enjoy herself. However, she primarily believed the benefit of exercise was weight loss. The second woman was morbidly obese and acknowledged that exercise would help her to lose weight and also that weight loss would improve her mobility. Another participant who spoke about mobility explained how her GP told her:

...you've got to lose weight because you're a bit heavy and not only that it doesn't help you arthritis. (P29/F/55/s)

In addition, she said that:

I was determined to lose weight cos I'd been on the waiting list to have me veins done. (P29/F/55/s)

Her goal was to have the operation. She believed that this would help her arthritis and reduce the pain in her legs. Her response shows that it was her GP who wanted her to lose weight. This feature was also present in the answer of one man who said his GP:

...suggested we get me weight down and I've retired you see, so I'm probably not getting enough exercise. (P10/M/61/s)

Both of these participants ceased to exercise at the end of the programme. They are similar to non-participants in that it was primarily their referrer who wanted them to do physical activity on the programme. In addition, they use words that indicate doubt that they should exercise (such as 'probably').

When talking about weight loss, one woman emphasised how it is hard for very overweight people to exercise and said:

It's very difficult when you carry so much weight...It's not an excuse but, I want to do it, but I also know I've got limitations because I tend to go like a bull in a china shop, get all enthusiastic. (P33/F/37/s)

Her quote also shows how she had a tendency to over do things. This feature is also evident in the interview of another woman who wanted to lose weight and said:

I thought I must have done too much because it really crippled me. (P29/F/55/s)

Neither of these women continued their activity beyond the end of the programme. Thus, having unrealistic expectations about capabilities and overdoing things is suggested to be a factor that has an impact on continuation of activity. It is also probable that this type of behaviour will result in injury, as one of the examples illustrates when the participant said the physical activity "crippled" her.

In addition to talking about weight loss being one benefit of activity, participants also referred to benefits such as an increase in physical strength and keeping you in shape (n=2). Some participants also believed that physical activity is important for the heart (n=3). The first one said:

I've obviously got general knowledge on the fact that it's good for your heart to exercise. (P33/F/37/s)

The second said:

I mean you should keep yourself at it. I mean everything says so. All the books and papers always say, exercise is important for the heart. (P23/M/63/c)

And the third one said:

I knew I wasn't exercising me heart and I knew I was storing up trouble for meself in years to come. (P28/F/50/c)

Whilst two of these participants continued with activity beyond the end of the programme, one woman did not. She believed that:

I just don't think I really applied any of the principles for long enough. I don't think I gave it a chance really. (P33/F/37/s)

In contrast to the other two participants who took a longer-term view of the cardiovascular benefits of physical activity, she wanted to see immediate benefits in terms of weight loss and said:

I want to wake up in the morning thin. (P33/F/37/s)

This highlights that the time perspective that people take when considering the health benefits of physical activity have an impact on maintenance of activity over the longer term. This is discussed in depth in the time domain (Chapter 9).

Whilst participants talked generally about the physical benefits of activity, they were much more likely to talk about benefits that they had personally achieved from participating in physical activity. One man, for example, spoke about how he judged the benefits he had obtained from physical activity on the programme and said:

I mean I judge my health by when I go to the hospital and get my blood taken and all the other things taken. And what the results are from those and touch wood, since I did the course, I have not had a bad result. (P8/M/49/c)

Another man described how:

Oh I think it's made a lot of difference. Err you know, I'm more flexible. You know I'm not as rigid. I think if any body exercises they feel better for it really. (P18/M/71/c)

Participants also spoke about personal achievements from physical activity in terms of psychological benefits. In particular, physical activity was believed to help with mental well being (n=2) and to improve self-esteem (n=2), as the following examples show:

I get down you know, but the thing is when I was doing the exercise, the downers were a lot less you see. Say for example I was having a downer a week, err but when I was doing the exercises only a downer every three weeks, to it seemed to fight that off. (P21/M/61/c)

And:

I came out and I'd done the exercises, I felt a lot healthier. And me confidence was up and me self-esteem felt a bit better and then I felt as if I was a bit more toned up you know. I just felt healthier really. (P32/F/37/c)

And:

So it's helped me in lots and lots of ways besides the exercise, it's helped me socially as well, you know which has given me that much more self-confidence, you know. (P15/F/64/c)

These participants believed that physical activity was responsible for providing them with psychological benefits. In each case, they continued to exercise beyond the end of the programme.

The majority of participants spoke about the general benefits that they believed they had gained from physical activity (n=10). Many of them believe that physical activity makes you feel better (n=7) and said for example:

I feel better for it. No doubt about it. (P23/M/63/c)

In addition, it was believed to make you healthier (n=2), be good for you (n=2), prevent illness, (n=2) and also to promote wellbeing (n=1) and keep you young (n=1). One example of this is a man who said:

I am more flexible, I can move better. When I tell people how old I am, they say I didn't think you were that old A couple of others, he had a heart attack and he is only 68. So it must keep me young yeh. (P18/M/71/c)

One other example is a man who described that:

The main thing is that you really have to do exercise to maintain your health. I think I have found that that was a very important factor in my life. Because if I wouldn't have done any exercise, I wouldn't have come back so quickly from my unfortunes. And even after I had an operation, before I went for operation, it helped me. (P20/M/72/c)

Whilst the majority of participants believed they would benefit from activity on the programme, some participants started the programme with a belief that activity may not improve their health (n=2). One woman said:

Well you know I fool meself, thinking oh it'll improve me osteoporosis, knowing dam fine it won't (laughter) you just kid yourself. (P25/F/72/s)

And the other one said:

I was a bit worried in case I wouldn't benefit from it, and that. But you've got to have a go at something, well anything. You know to try and test, you know what you can do and what you can't do really haven't you. I mean if you don't do any thing, you don't get anywhere do you? (P29/F/55/s)

Both of these women stopped exercising after the end of the programme. The first woman valued benefits in terms of enjoyment and proving she could still exercise, which she felt she had achieved by the end of the programme. The second woman valued having an operation on the veins in her leg, which she achieved just after she completed the programme. It is suggested that these women completed the programme since it provided them with valued outcomes or reinforcements in terms of short-term benefits. However, they did not value longer-term health benefits and therefore saw no reason to continue with activity beyond the end of the programme.

Setting and achieving a short-term goal is therefore one explanation for participants failing to continue with activity beyond the end of the programme. However, other participants explained lack of maintenance of activity in terms of the exercise environment (n=2). These were both men and one of them explained:

I packed in the swimming cause the water was too cold (laughter), it was freezing. So I packed that in. (P11/M/53/s)

The other man described how when he went to the leisure centre there was:

A queue of about fifty million kids and I gave up and walk away you know...its just too crowded. (P10/M/61/s)

Another woman who did not maintain activity after the end of the programme did believe she had benefited from activity on the programme. However, she also felt that she had not achieved what she expected and said:

General health wise yes I think I did improve. But my mental attitude probably went quicker down the toilet because I felt negative because I hadn't achieved what I wanted to achieve and because of that you tend to block a lot out and think oh, failed on that count. And put it all to the back of your mind and carry on with your life regardless. (P33/F/37/s)

Her transcript illustrates the importance of setting realistic expectations, both in terms of the health benefits and the time within which they can be obtained. Her example contrasts to that of another participant who did continue beyond the end of the programme. This man said:

I mean I never had any illusions and thinking well I'll run up and down here and finish up like Mr Universe. I was never disillusioned. All my goals were just to sort of get fitter than I was really and take some of the problems out of me head. (P21/M/61/c)

His narrative shows that his expectations were realistic. It is suggested therefore that this is a factor that contributes towards longer-term maintenance of activity beyond the end of an exercise programme.

Risk perceptions (physical activity)

A number of participants were concerned that physical activity may cause them some harm (n=7). Many of them were concerned about physical harm and causing themselves damage (n=7). One woman who attended the supervised chair exercise classes described her experience when she tried to exercise unsupervised in the fitness suite and explained:

I went once and erm, I really enjoyed it and erm think I did too much. The day after I really, I think it put me off and that. He said, you must have done too much and that you know. It put me off a bit, I felt frightened. It's silly really but I felt frightened of err going again and that. So I didn't go again. I don't know why. What I was doing you see. I didn't know me own strength really. (P29/F/55/s)

Her interview illustrates that she caused herself harm and this meant that she did not attempt this activity again. Other participants also described their concerns about physical activity and said:

...me blood sugars tend to hit the floor, you know, with doing a lot of exercise. (pause) I was a bit wary of that. (P11/M/53/s)

And:

...you could go to the gym, and be encouraged to get started on an exercise programme, that was appropriate for some body my size without killing myself you know. (P33/F/37/s)

And:

Well as they say, you've got to do it slowly, you can't be sort of just running at it. Because I think then you would probably perhaps damage yourself, or something. We are all older as well aren't we, it's not like where young people can do it. (P26/F/69/s)

Each of these participants had attended supervised sessions with one of the advisers. However, they each ceased to maintain activity on their own after the end of the programme. Their answers indicate that they were concerned about doing some harm if they exercised unsupervised.

Three of the participants who had continued to exercise beyond the duration of the programme also felt concerned about exercising unsupervised. The first said:

*They do look after you. Make sure you're not killing yourself (laughter).
(P34/M/61/c)*

The second said:

Like, do I soldier on through the pain, how much do I soldier on before it goes pop and I can't do any thing for months. (P28/F/50/c)

And the third said:

So you don't really know whether you are doing good or bad sometimes. I could be doing some of those machines now which could be doing more harm. (P23/M/63/c)

Two of them were very proactive in seeking information about their health and activity. One of them monitored his own blood pressure after he had exercised and the other was receiving support from a pulmonary rehabilitation programme. The third participant relied on her son who was a qualified exercise professional to help her maintain safe activity. She said that:

*There was a lot of apprehension about being on my own...me son...he comes up to the gym and looks at me programme. I have to say, if I hadn't had him, I don't know how I would have progressed from where I stopped at the end of the three months. As to how I would have increased safely my activity.
(P28/F/50/c)*

In addition to being concerned about physical harm, one participant was also worried about psychological harm and feeling uncomfortable (n=1). He described his first visit to the gym:

When I went in, I'd seen how all the other people were. You know, I thought oh my god...their bodies were beautiful...and I thought oh no, I'm not having this. But errm they were in a world of their own...so I just stuck to what I was supposed to and after a couple of weeks you get to know the different people and it was good. (P34/M/61/c)

Whilst this man was concerned about negative feelings, some participants said that they were not embarrassed to exercise (n=2). One woman for example described how:

Well if I can do it, there is no real reason why anybody else can't do it. You can't use disability and pain as an excuse, or I'm too fat, what do I look like on an exercise bike. And I just go, don't look if you don't like it, is what I say, look the other way if it offends you (laughter). (P28/F/50/c)

Enjoyment

When asked how they felt about physical activity and why they thought they had completed the 12 week programme, three quarters of the participants mentioned enjoyment (n=12). One woman mentioned enjoyment as something that is not a chore and said:

Exercising for me is a real buzz...is not something I've ever felt as being a chore to do. It's something I get a lot of enjoyment out of. It's good fun. (P28/F/50/c)

Another man illustrated how the type of exercise influences enjoyment and said:

I really do enjoy exercising, but then it depends what sort of exercise. I mean there is no way I'd start, well one thing I can't do, I can't run. I mean, I can run obviously, but I find it so boring. (P21/M/61/c)

Another man spoke about enjoyment of exercise alongside other things he liked to do:

I'm not a fanatical keep fit person, but I like to keep really fit. I do sit down and watch tele at night, and have a read of the paper and that sort of thing you know. I like to keep fit though as well. I enjoy it basically. (P18/M/71/c)

Each of these participants spoke about general enjoyment of physical activity. However, enjoyment was also mentioned more specifically, in the context of being an important factor in the maintenance of activity on the programme (n=9). One example of this is a woman who said:

If I didn't have liked it I wouldn't have gone. I wouldn't have continued you know, if I was miserable and I didn't like it, no I wouldn't have gone. (P26/F/69/s)

Other examples are a man who said:

Well, it has given me something to do, to occupy me was the main thing. Err, I sort of enjoyed it to be honest, if I enjoy something, I carry on it you know.
(P11/M/53/s)

And a woman who said:

I quite enjoyed it. I said, I aint come for the good of me health, I've come to enjoy it. (P25/F/72/s)

However, two women participants did not expect to enjoy it. One said:

I was quite surprised you know, I really enjoyed it, err, I mean it was painful at first. Until I got used to it, I ached all over. (P29/F/55/s)

And the other said:

I enjoyed it, and I didn't think...I saw them going on this walking thing and I thought silly buggers, but it's amazing when you go on it you know.
(P26/F/69/s)

The first of these women initiated activity because she always does what her GP tells her to (this is discussed as part of powerful others health locus of control, Chapter 7).

The second woman wanted to exercise to get her out of the house.

The interviews of these participants show that it was important that the activity itself was both within their capability and also enjoyable. They also indicate that for some participants, enjoyment was the main motivation for completing the programme, rather than for health reasons.

Half of the participants said that they gained enjoyment from being with the other people whilst on the programme (n=8). One man illustrated this by saying:

May be that was one of the biggest benefits that I got out of it, was the array of age groups that were actually on it. You know, some very old people, some very young people. The fact that you talk to these people when you are doing these exercises and there was always a very good spirit when you have groups of these people there.....especially people with heart conditions, you would be cycling next to them sort of chatting about things you know. That was a plus in itself. (P8/M/49/c)

And another man said:

Just being with other people you know, you can get to know somebody and it makes it, I don't know. If you get to know people and they are all right, you know friendly, you go again. (P11/M/53/s)

In addition, two women also described the social aspects of activity. One said:

When you are waiting for the next apparatus, well you are standing talking aren't you. You know. Yeh, I thoroughly enjoyed it. (P26/F/69/s)

And the other one said:

The thing is, I've got a sense of humour, so I soon got on with everybody. So I didn't find it... I've made friends, one particular friend, which is very nice that we go together. I think its just the fact that its got me out of myself, I'm enjoying the people's company that I am with and erm.. I just don't find it a chore, I just find it enjoyable Yeh. (P15/F/64/c)

Each of these participants enjoyed making new friends. In addition, for some women it was important to get out of the house and be with other people (n=2). One woman said:

I think it's important really. Well, to meet socially with other people, especially when you are older I think, you should mix with other people. (P26/F/69/s)

And the other one said:

Well, meeting with other people. Because in the day I'm on me own all the time...well it got me out didn't it. (P29/F/55/s)

These answers also show that enjoyment of the social side of physical activity was an important factor in completion of the programme for many of the participants.

8.3.3.2 Beliefs about health

Health perceptions

Half of the participants described their health in a negative way (n=8). They used the words not very good, very poor, ill, fair to middling, and referred to their problems as serious and severe. One woman described her health as:

Not very good. Erm, I had high, very high cholesterol. Me blood pressure was all right erm I was, this is very hard for me to say, erm, I was over twenty stone. (P24/F/47/c)

Two other participants also used the word good in a negative way and said:

Well I felt it wasn't very good. (P33/F/37/s)

And:

It wasn't as good as it is now...I couldn't do absolutely anything. I was in a wheelchair. (P34/M/61/c)

Another participant said her health was:

Very poor. Very poor. Very very low and low self-esteem as well. (P28/F/50/c)

One woman described how:

I went in to see the doctor. I said to them, I've been feeling really ill and lethargic and the weight has just piled on. (P15/F/64/c)

However, one man had difficulty assessing his health and said:

Well as good as...apart from a bit of rheumatism. Erm, its probably is constant. Oh I don't really know, I could walk and do things like that, probably fair to middling (laughs), if you know what I mean. (P10/M/61/s)

Two participants said their problems were serious or severe. One said:

I had sort of quite serious health problems. (P8/M/49/c)

And the other one said:

I went for a long time and I was quite healthy and then I got quite a severe illness, depression. (P32/F/37/c)

Participants who described their health negatively were more likely to continue with activity beyond the end of the programme (n=6). In addition, women were more likely than men to give a negative description of their health (n=5).

In contrast, less than a third of the participants described their health condition in a positive way (n=5). This was the second feature to emerge from this sub theme.

Participants' used words such as very well, quite good, all right, fairly fit and not bad. One man, for example, said that:

I have had a heart attack...and now I'm completely normal, I feel very well. (P20/M/72/c)

Another participant said:

Touch wood, only for high blood pressure, I'm quite good really. (P26/F/69/s)

Two men used the word 'all right' and said:

Well me health was all right generally. (P18/M/71/c)

And:

It was OK. It was all right yeh...I have always been relatively fit.

(P23/M/63/c)

Three of those who described their health in a positive way were men. Two had already suffered from heart problems and the other had diabetes. Each of them believed that physical activity would maintain good health and prevent future health problems. All continued beyond the end of the programme. In contrast, the other two participants who described their health in a positive way were women. They participated in the programme for reasons other than health and neither continued with activity beyond the end of the programme.

In addition to describing their health in both positive and negative ways, some participants did not make a direct assessment of their health and spoke only about their problems (n=3). One of them described how she was in pain and said:

I've got arthritis in both knees, both ankles, me spine, me neck, me shoulders, me hips.. (P29/F/55/s)

The other two said:

I was having a problem with blood pressure and a few other things...I was and still am suffering with sort of post traumatic stress. (P21/M/61/c)

And:

Well I wasn't 100%. I'm not 100% fit and I've had that many ills and operations you know. (P11/M/53/s)

Although participants described their health both in both positive and negative ways, these descriptions did not convey whether they believed their condition was acute (short term) or chronic (long-term). The majority of participants believed that their health condition was chronic (n=12). Only two of these, both women, did not continue with physical activity beyond the end of the programme. However, in contrast, a quarter of participants believed their condition was acute (n=4). All of these participants did not continue beyond the end of the programme. A more detailed discussion of acute and chronic health perceptions is presented in the time domain (Chapter 9).

Health concerns

Some participants indicated that they were not particularly concerned about their health (n=4). One woman was dismissive of her problems and said:

I'm not worried, cause I know what I've got and that's it finished.

(P25/F/72/s)

Three others used the words 'a bit' to show that they perceived their problem to be small. The first one said:

I've got a bit of rheumatism, arthritis, and a bit over weight. (P10/M/61/s)

The second said:

I'm alright really, I've got a bit of a knotty finger...and that's about it...me hands have gone a bit distorted. But you see, things happen when you get a bit older don't they. (P26/F/69/s)

And the third one said:

I knew meself I felt alright, apart from me bit of arthritis in me back, and a bit in me knee, but that comes with old age doesn't it. (P18/M/71/c)

Only one of these participants continued with activity beyond the end of the programme. Whilst he made reference to age contributing to his health problem (along with one other participant), he was also concerned about not letting his health deteriorate (See IHLC theme in Chapter 7).

In contrast to these participants, many of the others indicated that they were concerned about their health (n=8). Some of these were concerned about their mortality and premature death (n=4). Three men described how:

I have had a heart attack...I just took early retirement and all that and I thought (laughter) that's really a bit early to go. (P20/M/72/c)

And:

The grandkids, err twelve months ago, I didn't think I'd see them next birthday. (P34/M/61/c)

And:

Some people just die of a heart attack like that, and if you have done nothing, what a waste. (P23/M/63/c)

One woman referred to dying when she said:

(The consultant) explained to me what this furred up artery means. And I was devastated. I felt god, I'm going to die...well I thought I don't want to die. (P24/F/47/c)

All of these participants continued with activity beyond the end of the programme. Their interviews show that premature death is a concern for them. This was

particularly so for men. However, women were more likely to be concerned about their mobility, pain or being tired (n=4). For example, two of them said:

I did have an illness of depression for a while and I became lethargic, I had no energy. (P32/F/37/c)

And:

I was very concerned...I've got mobility problems...I've also got very high pain levels. (P28/F/50/c)

In general, women were more likely to talk about being concerned about their health. However, the transcripts of each of the men who voiced concern included some reference to mortality and death.

8.4. Discussion

8.4.1 Introduction

The discussion is divided into seven sections, corresponding to the seven sub themes (Sections 8.4.2 to 8.4.8). Within each section, the findings from the non-participant and participant groups are compared and contrasted. In addition, any notable differences within each group, in terms of not starting activity/dropping out or completion of the programme/maintenance of activity beyond the programme are also discussed. Age and gender differences are also considered. The final section of the discussion briefly summarises the key points that emerged from this chapter in terms of the factors that influence initiation and maintenance of activity (Section 8.4.9).

8.4.2 Self-efficacy

Evidence from both the non-participant and participant interviews shows that mobility problems, particularly associated with arthritis and pain, have a negative impact on belief in capability to exercise. Indeed, work by Bandura (1977a) has also shown that fatigue and aches and pains may lead to lower self-efficacy beliefs. The non-participants with these problems were likely to be over sixty five, not working and to never initiate activity. Participants were much less likely than non-participants to talk about mobility and pain. Those who did were women. In both the non-participant and participant interviews, men were more likely than women to believe they were capable of engaging in physical activity, whereas women were most likely to doubt their self-efficacy. This finding is in line with a study by Clarke

and Eves (1997) that found a significant effect of gender for adherence efficacy, with men being more confident of completing their exercise prescription than women. Non-participants who were working (and, therefore, younger) were less likely to have mobility problems or to rate their capability to take part in physical activity in a negative way. However, despite a belief they were capable of physical activity, some non-participants did not initiate due to work commitments. The findings from non-participants indicate that self-efficacy is an important factor in initiation of activity for many people. However, some individuals may initiate activity without a belief in their self-efficacy and evidence for this emerged from both the non-participant and participant interviews. In the case of non-participants, this finding supports the work of Bandura (1997) who suggested that if people do not believe they have the capability to succeed, yet make an attempt, they will give up easily when they meet set backs or do not obtain results quickly. Indeed, the participant interviews did show evidence of perseverance, along with a realistic belief that it would be difficult at first but become easier as time went on.

Evidence from the participant interviews showed that self-efficacy may change over time as individuals engage in physical activity. Indeed, where participant's efforts to control their health were successful, there was evidence that self-efficacy increased (as advocated by Rothman, 2000). This finding is in line with the suggestion that the value of a behaviour will not decline if the behaviour succeeds in producing the desired outcome (Phares, 1971). Thus, for those participants who doubted their capability to exercise at the beginning of the programme, the successful achievement of valued outcomes served as a way of increasing self-efficacy beliefs. It also resulted in the maintenance of a belief in the value of the exercise behaviour or may even have increased the value of it. This finding also supports the work of Sallis *et al.* (1989) who found that efficacy was reciprocally determined by behaviour and that people may move from low to high self-efficacy as they start to engage in behaviour change. If participants doubted their capability at first, this belief may have changed due to a realistic exercise programme that was within their capability, that allowed them to gradually increase the level of activity, to gain in confidence and achieve valued outcomes. However, whilst a belief in capability to exercise was found to be a key factor in the successful completion of the programme, it was not necessarily a pre-requisite for initiation of activity on the programme or a factor that

predicted continuation of activity beyond the end of the programme. This finding supports the work of Marcus and Owen (1992) who found that people in the maintenance stage of exercise exhibit the highest self-efficacy, whilst those who are not yet contemplating exercise show the lowest self-efficacy. The findings also show that self-efficacy is just one of a number of factors that combine to influence the initiation and maintenance of physical activity behaviour.

8.4.3 Importance of physical activity

Both non-participants and participants talked about the relative importance of physical activity in their lives. However they did this in different ways. Physical activity was less important to the non-participant group, whereas it was far more important to the participant group. This would indicate that most participants were doing physical activity for health reasons (as suggested by Laffrey & Isenberg, 2003). Indeed, when non-participants, especially women, did talk about physical activity being important, this was because they were unable to drive and therefore had to walk. The implication here was that they were active out of necessity, rather than for health benefits. Non-participants were more likely to be working than participants and, therefore, focused on the difficulty of having to fit physical activity around their work commitments. In contrast to the non-participants, men participants were all retired and did not have work commitments. For men non-participants, work was a significant factor that influenced their perceived ability to participate in activity, due to lack of time. Indeed, lack of time has been found to be one of the key barriers to physical activity (e.g. HEA, 1992; Steinhardt & Dishman, 1989). This is particularly so in the younger age groups (Booth *et al.*, 1997). Non-participants and participants who worked or had family and caring responsibilities were the most likely to lack time for leisure activities and this would explain why they were the ones most likely to drop out of the programme or to discontinue with activity beyond the end of the programme. Other aspects of individual's lives may be more important than their own health. Indeed, both the non-participant and participant interviews highlighted that family and caring responsibilities affect physical activity behaviour. In particular, women with these responsibilities tended to believe that it is selfish for them to exercise. These findings support research that found women continue to bear the majority of household and caring responsibilities (ONS, 1998b). In contrast to the women participants who were married, the men did

not talk about fitting in physical activity around family and home commitments. This would indicate that women participants in this study took responsibility for household chores and the family and that this affected the time they had for themselves and physical activity (and why they did not continue activity beyond the end of the programme).

Non-participants were more likely than participants to believe that diet was the best option to enable them to achieve valued outcomes (indicating a weight loss goal). Changing their diet was, therefore, believed to be more important than physical activity. This is interesting since regular physical activity has been shown to attenuate many of the health risks associated with overweight or obesity (Blair & Brodney, 1999). The finding indicates that health was not of primary importance to non-participants. The evidence suggests that non-participants focused on diet due to the belief that changing this would be a less time consuming and simpler option to incorporate into their busy schedules. It may also have been due to the fact that they did not see physical activity as being important for other longer-term health benefits. One factor that may have contributed to this belief is age, particularly since non-participants were more likely to be younger than participants. Indeed, older people are more likely than younger ones to be coping with health problems (Aldwin, 1991) although they may be confused about how to stay healthy (O'Brien Cousins, 2003).

8.4.4 Benefits

There was evidence from both the non-participant and participant interviews that physical activity is believed to contribute towards good health, both physical, psychological and general. However, whilst both groups were well aware of the potential benefits of physical activity, they did not necessarily believe that these benefits were relevant to them (which supports findings from existing research, HEA, 1992). One benefit, which both groups believed would result from physical activity, was weight loss. However, if individuals did not believe they needed to lose weight, they were not motivated to exercise for this reason, even if their referrer thought they needed to lose weight. Indeed, both the non-participant and participant interviews showed that if the referrer wanted the outcome from physical activity, rather than them, this had a negative influence on physical activity behaviour. In these circumstances, non-participants are not likely to start activity and participants

will only maintain for the duration of the programme and then stop. This evidence also shows that non-participants are not likely to be persuaded to participate in activity by their GP if they do not believe it will benefit them. However, participants would appear to be more likely to listen to their GP and start activity even when they doubt it will be of benefit to them (this has been discussed in Chapter 7). Non-participants were likely to believe that physical activity on the programme would not provide them with any valued benefits. In contrast, the majority of participants did believe they would obtain valued benefits. Participants were most likely to talk about the specific benefits they had obtained from physical activity on the programme. In contrast, those non-participants who did start activity for a short period were not likely to talk about achieving any valued outcomes. This could be due to them having unrealistic expectations regarding how long it would take to achieve benefits. In addition, the men non-participants who started and then dropped out of the programme did not find the activity environment enjoyable enough to want to persist with activity for the length of time required for benefits to be seen.

Both non-participants and participants discussed the psychological benefits of physical activity. Participants who suffered from depression believed that activity on the programme had helped them with this and all continued to exercise after the end of the programme. In contrast, the non-participants with depression attempted to start activity only to drop out soon after. Since non-participants were the group most likely to be in work, this was possibly due to the interaction between work, psychological health and physical activity, for example the time pressures associated with work may have made it more stressful for them to fit activity in to their lifestyle. Indeed, Bandura (1997) has suggested that if the demands of the behaviour are too taxing, this will result in stress. Participants who did not continue beyond the end of the programme were likely to doubt that they would benefit from it, to believe that the main benefit was weight loss and to have a tendency to overdo physical activity. This indicates that they were looking for benefits to be achieved quickly and also had unrealistic expectations about their physical activity capabilities. If they set and achieved a short-term goal for example, they were likely to discontinue with exercise. This was particularly the case for women participants. In contrast, the men who discontinued their activity after the end of the programme were more likely to have been discouraged by the activity environment. The activity

environment was a factor that had an impact on men in both the non-participant and participant groups. This evidence shows how the activity environment is particularly important for men and also relates to other evidence that emerged under the enjoyment sub-theme. This found that competitive activity is especially important for men. Those participants who continued to exercise beyond the end of the programme viewed the benefits of physical activity as more than weight loss. They were more realistic in their expectations about their capabilities. In addition, they valued outcomes related to longer-term health benefits. There was evidence from both the non-participant and participant interviews that in order to achieve the desired benefits from physical activity, there needs to be a realistic expectation regarding the time it will take to achieve the valued outcomes.

8.4.5 Risk perceptions (physical activity)

Concern about physical activity causing harm was present in both the non-participant and participant interviews. However, non-participants were more likely to believe that there may be negative psychological consequences from participating in physical activity on the programme. In contrast, participants were less likely to be concerned about how they appeared to others when they exercised, or to be embarrassed about their physical appearance. Participants were more likely to be concerned about physical activity causing them physical harm, although they did not specify exactly what damage they believed they might sustain from physical activity. This finding may be due to the difference in age profiles of the two groups. In particular, participants were generally older than non-participants, which would support existing research that found concern about injury to be an important influence on physical activity for older people (King, 2001). The population in the current study has a variety of medical problems that may put them at greater risk of injury. It is suggested, therefore, that their concern may be linked to their perceptions of their health problems, for example risk of causing more pain or disability from arthritis.

Eden *et al.* (2002) have suggested that people who stop exercising and drop out of supervised programmes do so because they experience some harm. The findings from the current study indicate that experiencing harm is a factor that has contributed both to drop out before the end of the programme as well as to failure to maintain

activity beyond the end of the programme. However, those participants who continued beyond the end of the programme were likely to overcome the fear of causing themselves harm by gaining support from elsewhere, or by maintaining the programme set for them by the exercise adviser whilst they were on the programme. This highlights the importance of support for individuals who are at risk and are concerned about causing themselves harm. In addition, those participants who maintained activity beyond the end of the programme, (although acknowledging there may be a risk to their health from the activity), may also have believed that the benefits they would gain from activity outweighed the potential risks.

8.4.6 Enjoyment

Both non-participants and participants spoke about enjoyment in the context of participating in physical activity. However, they did this in slightly different ways. When deciding to initiate activity, the belief that it would be enjoyable formed part of the decision making process for both non-participants and participants. Some participants initiated activity with a belief that they may not enjoy it. This perception changed whilst they were on the programme and they found that they did enjoy it. In contrast some non-participants initiated activity and found they did not enjoy it and then dropped out of the programme. Therefore, enjoyment was found to be an important factor in completion of the programme for both non-participants and participants. Participants were the only group to talk about how they generally gained enjoyment from physical activity, although the type of exercise was an important factor in the level of enjoyment that was obtained. Both non-participant and participant interviews contained evidence that one of the factors that contributes towards enjoyment of physical activity is being with other people. However, whilst participants did not speak about taking part in competitive activity with others, for non-participants this emerged as an important part of the enjoyment, although this was evident only in the interviews from men. Since the programme did not include competitive activity, it did not offer enjoyment to these non-participants. Indeed, as Biddle (1994) suggests, the challenge of the environment may not have been sufficient for men, which resulted in boredom and ultimately drop out. However, gaining enjoyment from being with other people was a key factor that contributed towards completion of the programme. Those participants who maintained activity beyond the end of the programme were the ones most likely to have enjoyed the type

of activity as well as enjoying exercising more generally. In addition, they were likely to have formed social relationships through physical activity that continued beyond the end of the programme. However, other participants who also enjoyed all aspects of the programme stopped activity after the end of the programme. Whilst enjoyment is a key factor in completion of the programme, it does not predict maintenance beyond the programme. This may be because other factors moderate enjoyment, such as health motives and support from the programme (as advocated by Garcia & King, 1991).

8.4.7 Health perceptions

Non-participants were more likely than participants to talk about their health in a positive way. This could have been due to the difference in age profiles between the two groups, since in general non-participants were younger than participants. Research by Benyamini, Leventhal and Leventhal (2000) and Arber and Cooper (1999) may help to explain the differences between non-participants and participants health perceptions. In particular, Arber and Cooper (1999) found that in older age groups, women reported poorer health than men and that the proportion of people rating their health as less than good rises with age. Since the age profile of non-participants in the current study is younger than that of the participants, this indicates that some of the difference in health perceptions between the two groups is due to age. There were also gender differences in the participant group, with men being the most likely to talk about their health in a positive way. This may have been because men made more use of avoidance coping, whereas women were more likely to confront the health problem (Weidner & Collins, 1993). It may also have been due to the different health problems suffered by men and women.

It is interesting that the majority of non-participants who described their health positively never started on the programme. In contrast, it was those non-participants who felt negative about their health who attempted physical activity for a brief time and then dropped out. This evidence indicates that in order to initiate activity, non-participants must believe that there is some problem with their health. Those who do not believe there is a problem and describe their health in a positive way, may not believe that they need to change their behaviour or may think that they are already doing sufficient activity. Indeed, people are not generally aware of the need to

exercise above their current level in order to achieve health benefits, and tend to believe they are doing sufficient activity (HEA, 1992). In contrast to the non-participants, participants were more likely to speak about their health in a negative way. It is suggested that this indicated they were concerned about their health and felt responsible for doing something about it. However, those participants who spoke about their health in a positive way and continued exercise after the end of the programme, also acknowledged that they had problems. One of the differences between them and those who stopped physical activity at the end of the programme was that their aim was to prevent future problems. Therefore, speaking about health in a negative way, or acknowledging there is a problem is suggested to be one factor that predicts initiation of physical activity. For participants, maintenance of physical activity is likely to be predicted by a negative view of health or a positive view combined with past health problems and a focus on prevention of future problems. These participants appear to have focused their efforts on reducing the threat and enhancing recovery prospects (as suggested by Cohen & Lazarus, 1979).

8.4.8 Health concern

The majority of non-participants were not concerned about their health problems. In contrast, the majority of those who participated in the programme did voice concerns about their health. This would suggest that a concern about current health status is a factor that contributes towards initiation of physical activity. Participants may have believed that the threat to their health was a long-term one and, therefore, have adopted physical activity as a coping strategy (as per Ingledew *et al.*, 1996) in order to reduce stress and make efforts to address the threat. Non-participants were likely to dismiss their health problems, whereas participants were concerned about premature death, mobility, pain and tiredness. Those non-participants who never started on the programme may have dismissed their problems as insignificant in order to justify why they did not take any action and start physical activity. In addition, those who started activity and then dropped out may have dismissed their problems in order to justify their discontinuation of physical activity on the programme. Indeed, they may have been overwhelmed by the lack of certainty of outcomes and stressed about changing their behaviour, thus leading to coping by giving up (as suggested by Krohne, 1993). Non-participants denial that they had a

health problem may have meant that they had no reason to alter their perceptions of themselves or their behaviour.

Some gender differences emerged in the way in which participants voiced their health concerns, with men being more concerned than women about cardiovascular problems and premature death. This finding supports the work of Hunt *et al.*, (1999) who found that women were more likely to report musculoskeletal problems whilst men were more likely to report cardiovascular problems.

8.4.9 Summary

Positive self-efficacy beliefs are important in the initiation of activity, although they are not a prerequisite for initiation. Pain and mobility problems have a negative influence on efficacy beliefs. This results in individuals being less likely to initiate activity. When valued outcomes are being achieved, self-efficacy supports maintenance of activity for the duration of the programme. However, this does not necessarily lead to the maintenance of physical activity beyond the end of the programme.

Lack of time due to work or family commitments has a negative influence on participation in physical activity. Individuals with these responsibilities tend not to initiate activity, to drop out quickly after starting, or to fail to maintain activity in the longer term. Whilst individuals generally believe that physical activity is beneficial to health, in order to initiate activity, they need to believe that they will personally achieve some valued benefits (this may be health or social benefits). Work would appear to have a negative influence on the benefits that may be gained from activity. In particular, the costs in terms of time pressures and added stress outweigh any benefits. When individuals have conflicting demands on their time, physical activity is not perceived to be an important aspect of their lives.

Enjoyment influences both the initiation and maintenance of activity, although a belief that physical activity on the intervention will be enjoyable, is not necessary for initiation. However, enjoyment does have a positive influence on maintenance of activity in the short term. This results from the type of activity, the activity environment (particularly for men) and the social aspects of participation. However, in the longer term, these factors are not sufficient, in themselves, to sustain

behaviour change. One factor that does appear to be an important consideration in the maintenance of activity is fear of injury. This is particularly the case when the support of a supervised programme is withdrawn.

Describing current health in a negative way has a positive influence on initiation of physical activity. In contrast, a positive view of current health is likely to result in lack of physical activity. This indicates that perceiving health to be threatened has a positive influence on activity. However, where a positive view of health is combined with a history of chronic health problems and a desire to prevent future problems, this is likely to result in initiation and maintenance of activity.

Perceptions regarding the controllability of the threat also influence physical activity behaviour. Those who do not believe they can control the threat may not initiate activity. Therefore, the representation of an illness is an important factor that influences physical activity behaviour.

Maintenance of activity is supported by perceptions that benefits are long-term outcomes, as opposed to short-term solutions to a problem. Therefore, valuing outcomes that are related to longer-term health benefits have a positive influence on the maintenance of activity. In addition, a realistic expectation regarding the time frame required to obtain valued benefits would appear to support maintenance of activity. Indeed, time perspective is a helpful concept for understanding health behaviour. It is discussed in detail in the Time domain in the next chapter (Chapter 9).

Chapter 9

Time

9.1 Introduction

In the previous chapter a brief mention of time was made in the context of how long participants perceived it would take to achieve valued outcomes. However, the concept of time in a broader sense emerged as an important feature of the thesis and, therefore, the aim of this chapter is to present it as a separate domain. References to time were made in the interviews in a number of ways. This included whether individuals were orientated towards the past or future; whether they focused on the short or longer term; how they made attributions with reference to time; managed and organised their time and perceived they had changed over time. The literature that is pertinent to this chapter includes perceived control; attributions; self-efficacy; outcome expectations; time perspective and time line. This will now be briefly discussed.

In their review of perceived control, Wallston *et al.* (1987) identified control over time (i.e. control over past, present or future) as one of its important dimensions. They suggested that the distinction between control over the cause of the problem (past) and its solution (future) seem particularly relevant to health behaviour. In addition, they found that studies on perceived control have distinguished between attributions of responsibility for the onset of a problem and attributions of responsibility for solutions to a problem. Individuals might, for example, believe they are not responsible for getting a disease, yet believe they can control how they respond to it. Attribution research is concerned with what individuals believe has caused past outcomes. In their review of the attribution literature, Fisk and Taylor (1984) suggested that attributions are important because they underpin judgements, achievement expectations, emotional reactions and future behaviour. In their review of attributions and health Benyamini, Leventhal and Leventhal (1997) found that individuals do not universally search for causes of their illness, even under unexpected conditions, uncertainty or threat. However, Fisk and Taylor (1984) have suggested that causal analysis becomes especially important when people are surprised or threatened by events that undermine their beliefs and expectations. Benyamini *et al.*'s review (1997) found evidence to suggest that in the early stages of illness, when symptoms are mild and slow to develop, individuals may interpret

them as normal or unavoidable signs of ageing rather than signs of disease. They also found that emotional distress was lower when illness was attributed to an uncontrollable event rather than to one for which an individual was personally responsible. They suggested that it is essential to recognise that attributions and adjustment are likely to vary according to different illnesses. A serious event such as a heart attack for example, is followed by a brief recovery period and lingering fear of recurrence, whereas arthritis and diabetes involves the concern of daily lifetime coping.

Bandura (1997) has argued that one way in which efficacy beliefs regulate behaviour is via cognitive processes, such as the time perspective taken by an individual. Indeed, the time perspective (past, present or future) that an individual adopts has been found to be particularly relevant to health behaviour. Bandura (1997) suggested that people who take a future time perspective (i.e. the way in which they think ahead and set goals for themselves) in structuring their lives tend to have a high sense of self-efficacy. According to social cognitive theory, the more self-efficacious people are, the higher the goals they set for themselves and the better they perform (Bandura, 1997). The cognitive processes of reconstructing the past, interpreting the present and constructing the future have been found to influence current decision making (Zimbardo & Boyd, 1999). This research found that having a short-term time perspective (i.e. habitually focusing on the here and now) was negatively associated with healthy behaviour practices. Zimbardo and Boyd (1999) argued that long-term thinkers, who construct the future, are more likely than short-term thinkers to engage in health protective behaviours. Other researchers have also found that time perspective is a psychological construct that is capable of explaining why people have difficulty maintaining health behaviours (e.g. Carstensen, Isaacowitz & Charles, 1999; Hall & Fong, 2003). Time perspective has been found to be causally related to health behaviour and increasing participants long-term time perspective, was found to enhance health behaviour (Hall & Fong, 2003). In their review entitled 'taking time seriously', Carstensen *et al.* (1999) proposed that the perception of time is integral to human motivation, influences behaviour and plays a fundamental role in the selection and pursuit of social goals. They suggest that when time is perceived as expansive and open-ended, knowledge related (long-term) goals are given priority. In contrast, when time is perceived as constrained or limited,

emotional (short-term) goals assume priority. In particular, they argue that when time is perceived as limited, activities that are unpleasant or believed to be devoid of any meaning, are not compelling for an individual.

According to Leventhal & Benyamini (1997) every procedure involved in coping with a health threat is deemed to have an associated outcome expectation. However, outcomes that are anticipated in the immediate and longer-term do not compete on a level playing field. In fact, it has been demonstrated that a preference for larger, later rewards, over similar, immediate rewards reverts as the larger and later reward becomes further removed in time (Lowenstein & Thaler, 1989). Hall and Fong (2003) have noted that engaging in regular physical activity requires an individual to endure minor inconvenience and/or discomfort in the short-term in order to obtain favourable outcomes that may be realised at some unknown time in the distant future. The anticipated long-term outcomes (predominantly positive) associated with physical activity, are likely to be overshadowed by anticipated immediate outcomes (predominantly negative). It is the tendency to over-value the immediate consequences of physical activity that may explain why it is not maintained (Hall & Fong, 2003).

In addition to having an outcome expectation associated with it, coping with a health threat also has a 'time frame' associated with it (Leventhal & Benyamini, 1997). If the time frame exceeds outcome expectations, then the efficacy of the behaviour will be questioned. For example, the efficacy of physical activity may be questioned if it is ineffective, works too slowly, for too brief a time period, or doesn't work at all. Leventhal and Benyamini (1997) also put forward the concept of 'time-line' as one of the components or attributes of illness representations. Time line refers to the duration of illness and also to illness development. With respect to duration, individuals may believe their condition is acute i.e. short-term in duration, caused by temporary agents, and not a serious threat to long-term health. Alternatively, they may believe their condition is chronic, i.e. long in duration, caused by multiple factors and representing a serious threat to long-term health. Those perceiving their illness to be acute are more likely to drop out of treatment earlier than those who perceive it to be chronic. For example, it has been found that patients dropped out of hypertension treatment because they no longer had any symptoms and/or they felt

cured (Meyer, Leventhal & Gutmann, 1985). This study showed that individuals starting treatment for hypertension for the first time were more likely to believe the condition was acute, as opposed to chronic, and therefore, to fail to maintain treatment.

9.2 Method

Chapter 6 sets out details of the qualitative methodology. Table 7.1 contains a summary of the profile of study participants. Through a close reading of the interview transcripts, codes that included a reference to time were included in this domain. Codes were then examined in order to identify similar groupings. Five main themes emerged from this process (Table 9.1).

Table 9.1

Themes and features of the time domain

Theme	Sub theme	Features
Past or future time orientation	Looking backwards	Thinking about and recalling the past, including thinking about previous health and past physical activities. A desire to recapture the past in terms of past feelings and previous fitness.
	Looking forwards	Thinking about and predicting the future in terms of predicting future health outcomes and anticipating the future consequences of physical activity. Perceptions about avoidance and prevention of future health problems, along with consideration of future mortality.
Taking a long or short term perspective (time line)	Illness / Health	The time frame attached to an illness. Perceptions of it as long-term (chronic) or short-term (acute).
	Physical activity	The time perspective used when considering participation in physical activity. Is it considered as a short-term behaviour change (12 weeks only) or a longer-term behaviour change (beyond the duration of the programme).
Attributions relating to time	Age	The way in which ageing is used as the causal explanation for a health condition. Perceptions of the potential impact of retirement on health. Causal explanations for healthy ageing.
Management and organisation of time		How individuals chose to use their time and the approach they take towards time management.
Changes in health and self-efficacy over time		The impact of the 12 week programme on cognition and health. This is only present in the participant group.

9.3 Results

9.3.1 Introduction

Within the time domain five main themes emerged from the data. Four of the themes were present in both the non-participant and participant interviews, although the features within the themes were different in the two groups. The common themes were 'past or future time orientation', 'taking a long or short time perspective (time line)', 'attributions relating to time' and 'management and organisation of time'. The theme that was present only in the participant group was 'changes in health and self-efficacy over time'. Within the 'past or future time orientation' theme, there were two sub themes (looking forwards and looking backwards). Two sub themes also emerged from the time line theme (taking a long or short-term perspective with respect to illness/health and taking a long or short-term perspective towards physical activity).

The non-participant results are presented first (Section 9.3.2). The findings are shown under each of the main themes and sub themes, along with their respective features. The findings for participants are then shown in the same format (Section 9.3.3), along with the five themes and their respective features.

9.3.2 Non-Participants

The first theme in the non-participant interviews was past or future time orientation. This was present in two contrasting ways, looking backwards, or past orientation (n=7) and looking forwards, or future orientation (n=8).

Looking Backwards

Almost half of non-participants expressed a desire to recapture the past (n=7). Two of them spoke about wanting to regain their psychological well being and one of them said:

I remember that when I did go I felt a lot better about myself and maybe I want to feel like that again. (P5/F/29/do)

Many non-participants made reference to wanting to turn back the clock (n=5). This was in the context of being able to do the activity they had done in the past. One of them said:

In my head I'm not a pensioner I still think I want to do things as I did at a younger age. (P22/F/60/ns)

Another said:

You know I used to play squash, I used to play, well in my latter days, five a side football. I couldn't manage the full game but err, I just wanted to try. I suppose you just want to turn back the clock a bit. (P30/M/55/do)

The first example makes reference to age (which will be discussed later). The second example indicates that the man would like to be able to do the activity he had previously done. If non-participants expressed a desire to regain their previous level of physical or psychological function, they were likely to attempt physical activity, although they stopped shortly after starting. However, two of them did not attempt activity. One doubted her capability to exercise and the other did not believe she would gain any benefit from exercise on the programme.

Looking forwards

The second sub theme is taking a future time perspective or looking forwards (n=8). When they looked forwards, non-participants anticipated the consequences associated with undertaking physical activity. These consequences were viewed negatively with feelings such as embarrassment, frustration and discomfort (this has already been mentioned as part of risk perceptions in Chapter 8). A quarter of non-participants were concerned about the negative psychological consequences associated with taking part in activity on the programme (n=4). One woman believed there would be negative consequences to her psychological health if she attempted to exercise, and felt that these outweighed the positive benefits of exercising. Her use of the word "arriving" demonstrates the concept of looking forwards when she says:

But I knew that probably that if you take it overall erm my psyche was more important than arriving at the Oval and finding that I couldn't get to where the appointment was and being embarrassed. (P12/F/50/ns)

She also uses the phrase "if you take it overall" to indicate that she is weighing up the pros and cons of acting. Her quote has also been used to illustrate risk perceptions in Chapter 8 (in the context of being worried about negative psychological feelings resulting from physical activity). Her example illustrates how non-participants made predictions when they looked forwards. Three quarters of them did not believe they were capable of physical activity and this has already been discussed in detail as part of self-efficacy (Chapter 8). However, some of them made

a specific reference to the time required to achieve benefits (n=3). They predicted that they would not be capable of maintaining activity because it was not something they felt motivated to do in the longer-term. This was particularly because they felt any benefits would take time to achieve and would disappear once they stopped exercising. One woman demonstrates this when she says:

Changing is pointless because as soon as you stop, you're back where you started. (P2/F/27/do)

Like other non-participants, she believed that the cost in terms of time required to achieve an expected outcome outweighed the benefits of the activity. She, therefore, questioned the efficacy of physical activity, believed trying was pointless and concluded that change was not worth the effort. If non-participants had doubts about achieving benefits, they were likely to start physical activity only to drop out shortly after. However, most non-participant interviews did not contain reference to benefits they believed they could obtain from activity (n=12) and this has been discussed under benefits (Chapter 8).

One non-participant made a prediction about his life span when he demonstrated looking forwards and said:

We've got longevity in the family, so I'm going to go on until I'm 100, at least... immortality. (P27/M/78/do)

A belief in longevity may be another factor involved in explaining non-participation. It implies that no benefit would be gained by changing an existing lifestyle and that mortality is due to factors beyond his control (this has been discussed in the Health Locus of Control domain, Chapter 7).

Taking a long or short term perspective / time line

Non-participants mainly focused on a fairly short time frame (n=13). When they spoke about initiation of change, none of them made reference to prolonged effort or to time beyond the 12 weeks of the scheme. An example of this is one woman who did not see any change as long term. She believed that as soon as she stopped the new activity she would be back where she began and said:

No sooner you stop ...your back ...so it's pointless anyway (P2/F/27/do)

This suggests that non-participants acknowledge that a prolonged effort is required in order to obtain and maintain health benefits. However, any perceived health gain

is not seen as being worth the effort. A possible explanation for this is that non-participants do not see health as a priority for use of their time. This is discussed in a later section on management and organisation of time. When they spoke about achieving a desired outcome, non-participants emphasised a short time span. They wanted solutions that could be achieved quickly and without much effort. One man illustrated this by saying:

Pity you can't just shorten or stretch the thyroid, whichever way would make the weight come off. (P27/M/78/do)

One other non-participant who wanted results without expending any effort said:

I think really I expected some sort of miracle (giggles), you know to be given something like...probably expected to be given something you know, and then for something to work that way, the easy option basically. (P2/F/27/do)

Each of the non-participants quoted here started activity only to drop out later.

When non-participants talked about how their health had been in the past, they spoke about the duration of their illness. Most non-participants perceived that their condition was 'acute' and would therefore be short-lived, rather than something that could pose a threat to long term health (n=13). Some of these non-participants actually had a 'chronic' condition, for example they may have had a heart attack. However, they did not perceive the condition to be chronic or a threat to their long-term health. One non-participant (whose quote has also been used in Chapter 8 to demonstrate health perceptions) believed he had been 'cured' by surgery and said:

Me heart now seems smashing, you know, I don't have any trouble with pain or any of that with me heart. (P3/M/70/ns)

There were also individuals who felt their symptoms had gone since they visited their GP, or they had been cured. One of them said:

I was complaining so much about the arthritis, it came on me awful quick...it's gone a lot better... (P4/F/71/ns)

Non-participants with problems such as obesity or tiredness felt that this was 'temporary' and would not be threatening to longer-term health. One woman (whose quote has also been used in Chapter 8 to illustrate health perceptions and concerns) said:

I've just felt tired all the time, errm and I don't think there's anything medically stuff that's wrong with me. (P5/F/29/do)

This suggests that when a health condition is seen as short term, and not threatening to future health, non-participants see no need to change their behaviour.

In contrast, three non-participants believed their condition was chronic. One of these had an incurable disease. The other two did not believe that they had the capability to exercise due to chronic depression and chronic and disabling rheumatoid arthritis. These non-participants believed their condition was long term in duration and a threat to their health. However, it was factors such as low self-efficacy and concern about benefits being outweighed by costs that resulted in non-participation.

Attributions relating to time (Ageing)

As touched on earlier in this chapter, non-participants were likely to make an assessment of the ageing process when considering their health and thinking about participating in physical activity. Half of them attributed their health problems to ageing and the passage of time (n=8). A number of them referred to weight increasing over time and how difficult it was to lose this as they aged. One woman (whose example has also been used to show health concerns in Chapter 8) said:

...it's still not shifting. I seem to be accepting and putting on the weight gradually and (pause) I'm thinking oh you know, its only a couple of pounds and before you know it 's like two and a half stone (P2/F/27/do)

As well as referring to their weight increasing over time, non-participants talked about their fitness level and functional ability decreasing over time (n=6). This is demonstrated by one man who spoke about his age, increase in weight and decrease in fitness and functional ability as follows:

I mean I am only 45 now, I was 44 at the time, I felt I was putting on a bit of a paunch here (slaps stomach) and I've always been reasonably fit, and I found mes., because of that erm, being out of breath, erm I couldn't do any of the activities I would have normally have done. You know, just day to day living activities you know. (P19/M/44/do)

The younger non-participants, like this man, who were concerned about their level of functional fitness were likely to start activity and then drop out shortly after. In general, the transcripts from non-participants interviews indicated that whilst non-participants reflected on the changes resulting from ageing and the passage of time, they perceived this decline to be inevitable and beyond their capability to control.

Management and organisation of time

A quarter of non-participants believed that lack of time was a factor affecting their non-participation (n=4). Some explained this was due to being responsible for others. This included caring for elderly parents or spouses, being a single parent and being responsible for children. One woman described how caring made it difficult to have time for herself when she said:

Me domestic circumstances at the moment you know, I'm looking after somebody who isn't terribly good...so you know it's just a little bit difficult (P1/F/50/ns)

Another explanation that was given for lack of time was work commitments. This was often combined with being responsible for others. One man discussed how work and being a single parent left no time for physical activity when he described how:

I wasn't doing anything at all, apart from just work. Err, I have me daughter living with me so it was a case of going home from work, and cooking, cleaning, doing the usual single parent sort of thing (P19/M/44/do)

These responses suggest that priorities for non-participants are their responsibilities and work commitments. These took up most of their time and left them with little time for themselves. When they did have time for themselves, non-participants chose to spend it on something other than physical activity. One explanation, therefore, for lack of physical activity may be that non-participants did not see their health as a priority for their free time. There is also some evidence for this in the narratives of six non-participants who said that physical activity should fit around their other commitments (this is discussed in Chapter 8). Some other explanations may be that non-participants believe physical activity will not benefit their health (see Chapter 8 on attitudes and beliefs) or that they place the needs of others above themselves.

9.3.3 Participants

The first theme in the participant interviews is past or future time orientation. As with the non-participants group, this was present in two contrasting ways, looking backwards (n=2) and looking forwards (n=9). This differed from non-participants who were found to use both orientations to almost the same extent.

Looking backwards

Two participants demonstrated looking backwards. However, unlike the non-participant group, they did this within the context of looking to the future. When looking backwards, participants referred to feelings that resulted from past physical activity. Two women spoke about how they felt fit and how physical activity made them feel good mentally and physically. Both women believed they no longer had these feelings and expressed a desire to recapture them. One of them with high pain levels and poor mobility explained:

I get this buzz when I've exercised. I get this feeling, you know, the body buzzes. And erm I suppose when you've always exercised, maybe I took it for granted, but getting that back again was really important. (P28/F/50/c)

She emphasises how these past feelings were positive ones and therefore how important it was to experience them again. Her use of the words 'getting that back again' indicates a desire to recapture the past. The women specifically expressed the desire to recapture past feelings in conjunction with wanting to prevent future health problems. Although they recalled past feelings, the focus was on looking forwards to their future health, as the same woman explained:

weight was going on, you know, not having those benefits of how you feel when you exercise. Cause I like that feeling of when you exercise. Erm, I knew I wasn't exercising me heart and I knew I was storing up trouble for meself, in years to come. (P28/F/50/c)

The concept of looking forwards in time is illustrated by the phrase 'in years to come'. Part of this quote has already been used to demonstrate the benefits of physical activity (in Chapter 8).

Looking forwards

Over half of the participants looked forwards rather than focusing on the past and demonstrated an orientation towards the future (n=9). This is shown by participant's use of words and phrases that emphasise moving on, rather than a desire to recapture or regain what had already gone before. Two participants spoke about improving their current health. One said:

I wanted a degree of mobility to improve, my stamina to improve, the length of time I could sit in a chair. (P28/F/50/c)

The other one said:

The only goal I could say you set is to just to try and improve your, what you already have you see. (P21/M/61/c)

In addition, another two participants talked about how far they 'had to go' to achieve their health goals. One man spoke about measuring his health in terms of the frequency of visits to the hospital and said:

I was attending the hospital daily for months and then my goal was to attend it every two days and having achieved that, once a week, once a fortnight, once a month. (P8/M/49/c)

Whilst a woman talked about how far she had to go with her weight loss and said:

I've still got a way to go, cause I'd gone up to nearly twenty stone. So I erm, I really .. I'm doing really well at the moment so I'm down to fifteen now. (P15/F/64/c)

Three men believed their health might deteriorate if they did not exercise. They talked about wanting to avoid future health deterioration in terms of 'not wanting to let themselves go' and one said:

I think the worst thing they could do is sit me in the armchair and stagnate me see, so if you're up and doing like having a game of golf and as I say I walk every day. I mean that keeps the Dr away it keeps you sort of cold and flu's seem to bypass you (P21/M/61/c)

The second one said:

I have always been relatively fit and I've always kept myself in good shape. What I don't want to do now I'm retired is spread you know, and become unfit. (P23/M/63/c)

And the third one described how he believed:

The average person they don't seem to bother do they. You see some one with a belly sticking out like this (shows with hands) and you think whhhowh, my god. I can't understand people letting themselves go like that really. (P18/M/71/c)

These men were motivated to participate by a desire to maintain their current health and to prevent future health decline. Each of them successfully maintained their activity in the longer term and their examples illustrate two important factors involved in maintaining activity. The first is a desire to maintain or improve on current health status. The second is the use of problem focused coping. This

indicates that they acknowledge there may be a risk to their health in the future and that they have a desire to prevent any future health problems.

Another feature that emerged from the looking forwards sub theme was that participants talked about letting go of the past, putting setbacks behind them and focusing on moving forwards (n=4). This feature was particularly relevant to those who maintained activity in the longer term. Their responses suggest they have the ability to manage their health condition and to take responsibility for it as one man illustrates when he says:

If somewhere along that side you sort of collapse it is important to erm be depressed for one or two days but then to put it behind you and start up again. (P8/M/49/c)

He felt pleased with himself for having taken action that allowed him to improve.

Another participant who suffered with pain explained how:

I still have the problems and I'm very sore this past couple of weeks, but it hasn't stopped me. I've moderated my exercises and I've been careful but I haven't stopped and I know I'll get over this and I'll be back again you know doing my usual. (P28/F/50/c)

In addition, two other participants spoke about how their health affected their physical activity. One explained how her illness made her lethargic and this had temporarily affected her exercise:

That's part of the illness I had really...but it hasn't affected me otherwise. I keep exercising, I knew I'd get back to it. (P32/F/37/c)

The other spoke about how he viewed days when he could not exercise due to his pulmonary disorder and said:

Well some days you're bad, and you feel bad, well every body has them and you can't do as much as the day before, but you know it is only temporary and once the pulmonary rehab's finished, I'll join the gym again (P34/M/61/c)

This man was determined to resume his exercise in the future. In line with the other participants who looked forwards, he was not de-motivated or put off his long-term exercise plans by what he perceived to be a temporary set back.

When they looked forwards in time some participants made predictions about what they believed would happen in the future if they initiated physical activity. At the beginning of their 12 weeks of activity, a few participants looked forwards in time and predicted that their attempts to become more active would end in failure (n=3). For example, they felt that physical activity would cause too much pain. One woman (whose quote has also been used to illustrate self-efficacy in Chapter 8) said:

I really expected the usual, for me to manage exercise for 4 to 5 weeks and I'd hit a huge pain barrier. And not be able to finish. And I did hit it, I did hit it. but I wouldn't give up. (P28/F/50/c)

One other said:

I just thought with having..... you know I've got Lupus and erm... it's caused, well its when your own immune system fights your own body, isn't it. And mine gives me I would say, a form of arthritis. And I thought that it was going to be far too painful. (P15/F/64/c)

Despite predictions of failure, participants were prepared to initiate and persevere with activity. Expressing doubt about capability has been discussed in the attitudes and beliefs about physical activity theme (Chapter 8).

The last feature to emerge within the looking forwards sub theme was consideration of mortality (n=3). Three participants spoke about fear of premature death, highlighting that they believed their health condition would be long term in duration (this will be discussed later in this chapter). Although participants did not dwell on this fear, it influenced their initiation and maintenance of physical activity. Specific consideration of mortality and reference to death can be seen in the responses of two men. The first had suffered a heart attack and said:

I just took early retirement and all that. And I thought (laughter) that's really a bit early to go. (P20/M/72/c)

The second had chronic pulmonary disease and described:

Well now I've been through all this its paramount, it is. Because as I say, the grandkids, erm, 12 months ago I didn't think I'd see them the next Birthday sort of thing. And I was in and out of Arrow Park Hospital and I thought this is no good. (P34/M/61/c)

The phrases 'bit early to go' and 'didn't think I'd see them next Birthday' highlight that mortality is being considered. This also implies that they believe their health is at risk.

Taking a long or short term perspective/time line

Taking a long-term view of health was another feature of the participant interviews (n=12). A long-term view is defined as considering a period of time beyond the 12 weeks of the programme. One long-term view related specifically to health and involved perceptions of risk. This was where participants believed that their health problems could cause a serious threat to their health over time. When asked how important her health was to her, one participant expressed her feelings about this as follows:

I think it is very important you know. I think its really important especially when you've had an illness, and you know, quite a serious illness. I feel as if my health is one of the most important things for now and for the future really... I'm trying to prevent anything happening in the future, if I possibly could by exercising and trying to look after me diet a little bit. (P32/F/37/c)

This example is typical of how participants talked about their health condition or illness. They voiced a belief that the condition was not temporary and was therefore long-term in duration (or chronic). Perceiving a condition to be chronic can be expressed as an awareness that a past problem may recur in the future, even if it is not presently a problem. An illustration of this is one participant who had had a heart problem in the past. He felt that there was a possibility that this could recur and, therefore, believed that his problem was long-term and not short lived. He coped with the risk by taking action and changing his behaviour. He explained how he felt as follows:

I mean some people just die of a heart attack like that, and if you have done nothing, what a waste. If you have done something to try to stave it off and it happens, well there is not much you can do. So that is my policy like you know, to keep exercising to try to keep yourself in shape. (P23/M/63/c)

Similarly, another participant had very bad pain levels. She believed the pain was chronic and said:

I had no illusions about the pain. I knew the pain wasn't going to go away. But I wanted a degree of mobility to improve. (P28/F/50/c)

Her use of the words 'wasn't going to go away' illustrates her belief the problem is chronic. She copes with this by using physical activity to help alleviate the pain.

Another long-term view involved consideration of both health and physical activity. For example, participants wanted to maintain physical activity for two health reasons. Firstly, to prevent the reoccurrence of previous health problems and secondly, to alleviate a long-term health problem. In addition, participants acknowledged the need to keep up physical activity in order to maintain any associated benefits (n=4). Two participants believed that health benefits would disappear if they ceased exercising. One said:

For the two weeks after we stopped and we weren't involved and we literally doing anything and so the aching comes back and the tiredness comes back and all that. So I've learnt that to keep yourself sort of mobile you've got to and that's why I do the press ups and do the exercises every day.

(P21/M/61/c)

The other one said:

I keep my ligaments stretched and I find I don't hit huge pain barriers like I used to, cause I'm keeping my ligaments stretched. Cause they'll go back very quickly if I don't stretch. (P28/F/50/c)

Taking a future time perspective, over the long-term, is an important factor in the maintenance of physical activity. It involves the ability to persevere and a belief that a problem is long term and may be a risk to health in the future. It also includes a belief that benefits will cease if physical activity is not maintained.

Attributions relating to time (Ageing)

Another feature of the participant interviews was reference to the ageing process (n=7). Two of them spoke about how it was inevitable that their health would change over time and may deteriorate. However, they were comfortable with this and accepted the ageing process. This is evident in the interviews of two men.

When asked how his health was one said:

I would say very good. Obviously I am getting older. Other wise we will have to accept the facts of life. (P20/M/72/c)

And the other one said:

I knew meself I felt all right. Apart from me bit of arthritis in me back and a bit in me knee but that comes with old age doesn't it. I suppose (laughter).
(P18/M/71/c)

Participants also reported wanting to remain fit and active as they aged. Two men particularly referred to retirement as a turning point in their lives. One of them said:

You know when you retire you've got to, you've got to sort of think about your activities then you can't just sit down and you know go to seed. (P10/M/61/s)

The other man said:

...especially if you are my age, and you find it with people of my age who do retire, because I'm virtually retired so I think the worst thing they could do is sit me in the armchair and stagnate me...(P21/M/61/c)

These men believed it would be easy to cease activity at retirement. They did not want this point in their lives to signify the start of health deterioration. This is illustrated by their desire not to 'go to seed' or 'stagnate'. In addition, participants took pride in being seen as younger than they actually were. They attributed their youthfulness to physical activity. An example of this is one man (whose quote has also been used in Chapter 8 to demonstrate benefits of physical activity) who explained how he proudly tells people his age:

I am more flexible, I can move better. When I tell people how old I am, they say I didn't think you were that old (P18/M/71/c)

This participant attributes his flexibility and ease of movement to regular physical activity and believes this makes him appear younger. It indicates that participants believe physical activity can contribute to healthy ageing. It also implies that participants believe they have some control over their ageing and that it is a process that can be managed. An example of this is one participant who saw physical activity as a way of putting off the ageing process. He believed he was responsible for his health and said his goal was:

Just to get as fit as I can. That is to keep up a level of fitness, for as long as I can. It is staving off the ageing process isn't it really. Some one has too.
(P23/M/63/c)

Another way in which participants talked about their age related to not wanting to be perceived as 'old' by others. For some this was the motivation for initiation of

physical activity. In particular, they voiced a desire to prove to themselves that they could still 'do it' if they wanted to, as highlighted by the narrative of one woman who said:

Yeh, it was an achievement, to do that you know. Cause when you get older and especially younger people say, oh god she is too old to be doing any thing, you know. (P26/F/69/s)

She subsequently failed to maintain her activity beyond the 12 weeks which implies that long-term maintenance requires more than a desire to prove participants can still 'do it'. For example it requires a belief that healthy ageing can be self-managed and that physical activity can help delay or manage the onset of age related problems.

Management and organisation of time

Another theme of the participant interviews was management and organisation of time (n=6). This was present in two contrasting ways. Firstly, those who successfully maintained their activity in the long-term (beyond 12 weeks) had a very flexible approach to using their time (n=4). Whilst they planned physical activity in to their weekly schedule they were able to adapt their plan. For example, if they could not attend planned physical activity for some reason, this did not cause them any negative feelings. Participants continually looked forwards and easily resumed physical activity if they deviated from their plan. Two men talked about how they managed their activity around their families. One said:

I go three times a week. But if the wife wants to go out I go. I can go to the gym again. (P18/M/71/c)

The other one said:

If I can't do it one day for a particular reason, I can do it another day. I have that flexibility of time. (P23/M/63/c)

Some participants spoke about looking forward to physical activity and organising their other commitments around it. For example, one participant explained that he did not see physical activity as interfering in his life and explained how:

It gave us a sort of target in life we were looking forward to, and so we planned around that. If anything it gave me a programme to work to rather than interfering in our lives. (P21/M/61/c)

One other participant also spoke about physical activity being:

Something to look forward to each week. (P32/F/37/c)

The participants who managed their time in a planned and flexible way maintained activity beyond the end of the programme. However, in contrast, two women experienced negative feelings in trying to fit physical activity in to their lives. One explained how:

I can't fit loads of things in to a week. I have to know, I need to have a little bit of time for everything. I hate to have a day where I've got appointment, appointment, appointment. I can't separate them and it all just merges in and I can't deal with it (P33/F/37/s)

Both women failed to maintain physical activity beyond the 12 week programme. They had each set a target to attend physical activity every week but their following responses (The first one has already been used to demonstrate the importance of physical activity sub theme in Chapter 8) show how achieving this was problematic when they said:

You know the day is rushed you know when you are doing meals and you've got shopping to do. (P26/F/69/s)

I'd struggled with the 12 week programme, I found it so hard to get there. (P33/F/37/s)

If these women missed their planned activity, they had difficulty coping with the feelings that resulted from this. One of them summed this up by saying:

As soon as you start slipping a bit, once it starts going wrong, once you start not doing what you initially planned, you can't scramble back, you can't....and you start beating yourself up and then you become a bit negative (P33/F/37/s)

These two women felt that physical activity should fit around their other commitments. The importance of physical activity in relationship to other commitments has already been discussed and in particular how work and family commitments influence the management and organisation of time (see Chapter 8). Flexible time management is therefore seen as an important factor in the long-term maintenance of physical activity. A rigid approach to time management in terms of goals for attending physical activity may lead to negative feelings if the goal is not achieved, which may in turn result in lack of maintenance. In addition, the management of time would appear to differ according to gender, with men being

most likely to talk about fitting activity in with family commitments and women talking about struggling to manage conflicting demands on their time.

Changes in health and self-efficacy over time

The theme that was only present in the participant interviews was 'changes in health and self-efficacy over time' (n=5). Changes in self-efficacy have also been discussed in Chapter 8. Some participants voiced concerns about being unable to take part in activity (see the looking forwards sub theme earlier in this section). However, perceptions about failure were likely to change if a positive outcome was achieved. One woman demonstrates this when she says:

I often wished I could do it. I often wished I could do it. But I thought it was great once I had started you know, once I was able to do it and as the time has gone on, it has got much easier...Like I used to be absolutely exhausted after 5 minutes on the walker but I mean, I can get up to half an hour now....I hated the bike when I first went because of my knee. They thought at one stage that I would have to have an artificial knee. But erm, and it used to be painful on the bike, but now I can do 20 minutes on the bike now.

(P15/F/64/c)

Despite doubts about their ability to take part, participants with low self-efficacy were willing to initiate physical activity. They were also prepared to persevere even if they found physical activity hard. This is particularly evident in the narrative of one man who said:

After the 3 or 4 weeks, you did feel the benefits, instead of doing 2 minutes, you were doing 3 or 4, 5, 7. I thought this is good this. And I could go to me car without puffing and blowing. (P34/M/61/c)

Self-efficacy may therefore be modified by a number of factors, such as perseverance and seeing an improvement in health over time. This also illustrates how participants did not expect immediate results and indicates how they took a long-term view of health.

9.4 Discussion

9.4.1 Introduction

The discussion is divided in to four sections; past or future time orientation; taking a long or short-term time perspective; attributions and the management and

organisation of time. Since self-efficacy has been discussed in Chapter 8, the findings relating to self-efficacy are only briefly discussed as part of the last section. Within each of the four sections, the findings from the two groups are compared and contrasted. The factors relating to time that have been found to influence the initiation and maintenance of physical activity are summarised in the final section (9.4.6).

9.4.2 Past or future time orientation

Both non-participants and participants looked backwards and expressed a desire to recapture past feelings and past health. However, the way in which they did this differed. Non-participants were more likely than participants to look backwards. They wanted to have control of the past and expressed a desire to turn back the clock. In contrast, participants talked about past feelings in connection with their future health and a desire to prevent future health problems. Non-participants were pre-occupied with the past (recapturing) and in contrast to participants did not refer to the present (maintenance) or the future (improving) when they spoke about their health. This finding supports Wallston *et al.*'s (1987) suggestion that control over the cause of a problem (past) and its solution (future) is relevant to health issues. Wallston's concept of wanting control over the solution to a health problem is shown in the participant findings. This indicates that participants have a high internal locus of control and do not want to leave the solution to chance, or to give control to another person, such as their GP. In contrast, non-participants focus on the past may indicate a reluctance to take responsibility for their current and future health status. In particular they may not see the solution to their problem as being under their own control. A focus on control over the solution to a problem is therefore a factor that distinguishes participants from non-participants.

Both participants and non-participants also looked forwards in time, although in different ways. Non-participants looked forwards and anticipated the negative consequences of undertaking physical activity. They did not focus on the health benefits that may result from activity. Non-participants doubted that physical activity would produce valued benefits for them, or believed that the time required to achieve benefits was not worth the effort. In contrast, participants were able to devise ways of coping with their concerns. Their future time perspective enabled

them to overcome negative feelings, put the past behind them and move forwards. Participants focused on improving their current health and preventing future problems, rather than on curing what may have already happened in the past. This finding supports Zimbardo and Boyd's (1999) suggestion that it is the cognitive processes of reconstructing the past, interpreting the present and constructing the future that influence current decision making. Participants in general appeared to be longer-term thinkers and were therefore more likely to engage in health protective behaviours. Their long-term time perspective is illustrated by their fear of premature death and focus on prevention. They looked forwards and believed that they had some control over their ageing process and the timing of their death. Part of participant's motivation for engaging in health protective behaviour was to remain in good health as they aged.

9.4.3 Taking a long or short-term perspective

Non-participants mainly focused on a fairly short-term time frame and achieving valued outcomes quickly. In contrast, participants took a much longer-term view of their health and acknowledged that they would need to maintain physical activity in order to achieve valued benefits, such as healthy ageing and prevention of future health problems. The two groups also differed in the way in which they perceived their illness. Non-participants perception of their illness was predominantly as something that was short-lived and not a threat to long-term health. However, for the participant group, illness was perceived to be long-term and something that would have a negative influence on their health over time. Thus, perception of illness as chronic is a factor that has a positive influence on physical activity behaviour. This also indicates that 'time-line' (perceived duration of an illness) is an important factor that influences physical activity behaviour (as suggested by Leventhal & Benyamini, 1997).

In focusing on the short-term and perceiving time to be limited, non-participants will have given more consideration to the short-term costs associated with physical activity. Short-term cost will have dominated their decision making, especially since the longer-term benefits were further removed in time. Non-participants preference for immediate rewards will have outweighed their desire for longer-term benefits (as suggested by Lowenstein & Thaler, 1989). In contrast, participants were prepared to

endure inconvenience and discomfort in the short-term in order to obtain favourable outcomes in the future. The findings showed that non-participants did not believe they could achieve what they wanted within the time they believed was acceptable (which would support research by Leventhal & Benyamini, 1997). In fact, this was found to be a reason why many of them initiated activity only to drop out shortly after starting. However, those non-participants who never initiated activity did not believe physical activity would provide them with valued outcomes and, therefore, saw no point in changing their behaviour. Compared to non-participants, the participant group set longer-term goals for themselves. This may indicate that participants had higher self-efficacy beliefs than non-participants. This would support Bandura's (1997) suggestion that people who take a future time perspective tend to have a higher sense of self-efficacy and to set themselves higher goals.

9.4.4 Attributions

Both non-participants and participants made reference to their health problems in the context of their age and the passage of time. However, non-participants did not demonstrate a desire to take personal action for the solution to their health problems, whilst participants did. This implies that non-participants did not believe their own actions could influence health deterioration. This may have particularly been the case if they attributed the cause of the problem to ageing and the passage of time and believed that they had no control over this. In contrast, the participant group did demonstrate a belief that they could influence their health via their own actions (i.e. they attributed control for the solution to themselves). Both groups spoke about their desire to do the activity they wanted to do. However, only the participant group was prepared to take action over the longer term to ensure that their health improved or did not deteriorate further.

The findings indicate a distinction between the way in which the two groups view control over the cause of the problem (past) and control over the solution to the problem (future). Both groups attribute the cause of their health problem (to varying degrees) to ageing. However, non-participants were unlikely to attribute the solution to themselves, as something over which they wanted control, or something over which they were capable of taking control. In contrast, participants were likely to attribute control over the solution to themselves. It is possible that in perceiving

their illness to be short-term, non-participants interpret the illness as normal or as an unavoidable sign of ageing. As a consequence, they are not concerned about it and see not point in taking action. In contrast, participants view their illness as long-term and believe that through taking personal responsibility for it, they can avoid future deterioration.

9.4.5 Management and organisation of time

There was a difference between the two groups in the way they managed and organised their time. Participants viewed time in a more open way than non-participants. For example, if participants were unable to exercise due to other commitments they rescheduled their activity for another time without experiencing any negative feelings. In addition, if their health deteriorated and they were unable to exercise, they easily resumed activity once they felt well enough to do so. Participants, therefore, took a longer-term view of both their health and physical activity. They appreciated that over time their health would fluctuate and were able to cope with the ebb and flow of illness. If they were feeling too ill to exercise one day, they took a long-term view of exercise and looked forwards to when they were well enough to resume activity again. This finding suggests that self-efficacy changes over the course of an illness. Whilst health is good, participants believe they are able to exercise and when it is bad their perception of self-efficacy changes. Indeed, the findings highlighted that participants may initiate physical activity when they have doubts about their capability. However, if they persevere long enough to find out that they can achieve valued outcomes, their perceptions of capability improve.

The men participants were more likely than the women participants to perceive their time to be 'expansive and open ended' (this is Carstensen *et al.*'s, 1999, description of time). This would mean that they give priority to long-term goals. In contrast, women's conflicting family demands mean that for them, time is perceived as limited and constrained, therefore, women's priority are short-term goals. This would explain why men participants were more likely than women to maintain activity beyond the end of the programme. In a similar way to the women participants, the non-participant group was likely to see time as limited, particularly by work and family responsibilities. Thus, they perceived it as difficult to integrate

physical activity into their existing commitments (this has been discussed in Chapter 8). As Carstensen *et al.* (1999) suggested, it is possible that those individuals who see their time as limited will not feel compelled to take part in any activity. They will behave this way if they perceive something to be unpleasant (which physical activity may be in the short term) or devoid of any meaning (i.e. it will not provide any valued benefits within an acceptable time frame).

9.4.6 Summary

The time perspective adopted by an individual is a factor that influences physical activity behaviour. Those who are predominantly orientated towards the future and view this in a positive way will be most likely to initiate physical activity. However, a future orientation combined with a belief that a health problem is long-term in duration is particularly likely to result in maintenance of behaviour. Taking a long-term time perspective with respect to the outcomes from physical activity is also likely to result in maintenance. This will be particularly the case when individuals are capable of persevering long enough to enable the short-term (mainly negative) outcomes from physical activity to be outweighed by valued positive benefits. If an individual attributes control for the solution to a problem (a future perspective) to themselves, this is likely to have a positive influence on physical activity behaviour. Perceiving time to be limited and constrained due to other commitments will have a negative influence on physical activity behaviour, both in the short-term and longer-term.

Part Four

Discussion, Conclusions and Recommendations

Chapter 10

Discussion

10.1 Introduction

This chapter is divided into six main sections (aims and objectives of the thesis; theoretical perspective; summary of key issues from each empirical chapter; synthesis and discussion of key issues; limitations and future work and conclusions). The section that synthesises the key issues from the thesis consists of eight sub-sections (age; gender; health perceptions; self-efficacy, outcome expectations, health locus of control; GP influence and barriers. Each sub-section discusses the variable and its influence on physical activity behaviour and relates this to the relevant literature.

10.2 Aims and objectives

The thesis aimed to explore and understand physical activity behaviour in Wirral adults with risk factors predisposing them to coronary heart disease (CHD). The objective of the health and lifestyle survey was to provide a context for the subsequent studies and to investigate factors that influence physical activity behaviour in the general Wirral adult population. The thesis then sought to explore factors that influence initiation and maintenance of physical activity behaviour in individuals referred to a primary care exercise referral programme (the ELC). This included exploring the usefulness of health locus of control (HLC) and Wallston's modified social learning theory (MSLT) in helping to understand physical activity behaviour in those at risk of CHD.

10.3 Theoretical perspective

The majority of the research in this thesis was informed by HLC and Wallston's MSLT. A number of UK studies have suggested that HLC is useful for examining exercise behaviour (e.g. Norman *et al.*, 1997) and that this is particularly the case when the HLC dimensions are considered as an eight type typology (Norman *et al.*, 1998). In this thesis, it was hypothesised that HLC might be a useful conceptual tool for understanding physical activity in individuals referred to a primary care exercise referral scheme. In particular, the thesis sought to explore whether a combination of HLC beliefs may be useful for supporting behaviour change. Wallston's MSLT (Wallston, 1992) suggests that in order to engage in a health behaviour, an individual

needs to believe their health status is controlled by their own behaviour, be motivated by health and believe they are capable of carrying out the behaviour. This theory has not previously been tested in the context of an exercise referral scheme.

As a result of careful analysis of the qualitative data, a second theoretical perspective also emerged as an important one in this thesis. This was a self-regulatory model as proposed by Leventhal *et al.* (1992). This was found to provide a useful framework for explaining many of the concepts that emerged from Chapter 8 (beliefs about health and physical activity) and Chapter 9 (time). This model emphasises the central role of illness representations in guiding adherence decisions and suggests that health related behaviour, or coping responses, are influenced by an individual's beliefs or representations of his/her illness.

Whilst the thesis was informed by HLC, Wallston's MSLT and Leventhal's self-regulatory model, it is acknowledged that there are other theoretical perspectives that would also have been very relevant to the research in this thesis. These include the theory of planned behaviour (which has been discussed in section 2.10) and the transtheoretical model (which has been discussed in section 2.13). Another perspective that is particularly relevant to behaviour change is motivational interviewing. This is discussed as part of the recommendations chapter (improvements to the ELC, section 11.3). Self-determination theory (Deci & Ryan, 2000) focuses on the process of self-motivation and three psychological needs (competence, autonomy and relatedness). Self-motivation occurs when these needs are met. This theory is of practical significance to the study of exercise behaviour since it can contribute to knowledge about the causes of behaviour. As already discussed (section 2.10) no single theory is able to thoroughly explain physical activity behaviour. The implication of this for future research and practice is that concepts from a wide range of theoretical perspectives should be considered when studying exercise behaviour.

10.4 Summary of key issues

The findings from the health and lifestyle survey (Chapter 3) showed that levels of inactivity in Wirral are increasing. Individuals were significantly more likely to meet the current recommendations for physical activity if they rated their health in general as good, very good or excellent; did not have an illness, health problem or

disability; did not have arthritis and were not obese. Levels of physical activity were found to decline significantly with an increased age and men were significantly more active than women. Self-rated health was the best predictor of physical activity behaviour. The relationship between these two variables was mediated by age (with older adults being more likely to report poorer subjective health). The structural equation model showed the complex association between meeting physical activity recommendations and four key variables (self-rated health in general; employment status, age and gender).

The evaluation of the exercise and lifestyle centres (ELC) intervention (Chapter 4) showed that, in relationship to the general adult population in Wirral, women were twice as likely as men to be referred to the ELC. Referrals were also twice as likely to come from the 35 to 64 age group. Over a quarter of those who were referred did not start the ELC. Those who did participate in the ELC varied greatly in age (range 16-79) and medical conditions (e.g. BMI range 18-51). Women who participated were significantly more likely than men to have obesity, stress and arthritis, whereas men were significantly more likely to have high blood pressure, asthma/breathing problems, diabetes or previous history of cardiovascular disease. Medical conditions were also found to differ significantly by age group, with those aged 35 to 64 being significantly more likely than expected to be obese, have high blood pressure, high cholesterol, to have stress/anxiety/depression, arthritis/mobility problems and diabetes. Although, the 65 and over age group were significantly more likely to have suffered heart problems or a stroke in the past. Sixty one percent of those who started the ELC programme completed it (i.e. increased their levels of activity and/or had continued to take part in ELC activities by the end of the programme). Those most likely to adhere to the intervention were retired; of normal weight; rating their health in general as very good or good; from areas of low deprivation; without stress, anxiety or depression; aged over 65 and having transport. Gender was not found to be a significant predictor of adherence. The ELC was successful in increasing activity levels in 91% of those who completed it. However, only 52% of these individuals were meeting the recommended levels of physical activity. There was no significant difference between gender and change in levels of physical activity or meeting the recommended levels of activity (although men were more likely than women to meet the recommendations). The 65 and over age group were

significantly more likely to have increased their level of activity than the other age groups. However, they were significantly less likely than expected to meet the recommended levels of physical activity. The 35-64 age group were the most likely to meet the recommended levels of activity. Individuals reporting a positive change in their health at the end of the ELC programme were the group most likely to have increased their level of activity. Those rating their health as good, very good or excellent at the end of the programme were most likely to meet the recommended levels of physical activity. No significant difference was found between any of the variables and adherence to activity three months beyond the end of the ELC. However, those who completed the ELC and perceived pain was a barrier to activity were significantly more likely not to have continued with activity after the end of the ELC. One year after completing the ELC the only variable that predicted meeting the recommended levels of activity was geographical area, with those from the areas with the higher levels of deprivation and younger adult population age profile continuing to meet recommended levels. Whilst the ELC enabled small improvements in activity behaviour in the short term, it was not particularly effective in enabling participants to meet the recommended levels of activity in the longer term. The most frequently cited reason for failing to complete the ELC was health problems or illness (35% of drop outs). In addition, physical barriers (e.g. pain, injury, deterioration in health and overweight) were the most likely to have a negative influence on adherence to activity after the end of the programme.

The findings from Chapter 5 confirmed that individuals were more likely to engage in health promoting behaviour if they believed they had control over their behaviour (i.e. have an internal health locus of control). A combination of a belief in the role of powerful others and strong internal beliefs (a believers in control typology) were found to be particularly important in supporting behaviour change in individuals referred to the ELC programme. Those with this combination of beliefs were most likely to be successful in completing the ELC. Men were significantly more likely to have higher powerful others HLC (PHLC) beliefs than women. Those individuals holding high PHLC beliefs were significantly more likely to complete the ELC than those with low PHLC beliefs. PHLC beliefs were higher in the 65 and over age group. The combination of HLC beliefs differed by age group. The 35 to 64 age group were significantly more likely than expected to be pure internals and less

likely to be believers in control, whilst the under 35s had low PHLC beliefs along with a high chance orientation. Whilst HLC orientation predicted completion of the ELC, it did not predict maintenance of activity beyond the end of the programme. All of those participating in the ELC were likely to value their health highly (range = 8-24, mean = 18.7) and also to rate their self-efficacy highly (range = 0 – 10, mean = 7.42). However, health value scores were significantly higher than expected in the 35 to 64 age group, lower than expected in the under 35s and as expected in the 65 and over age group. Those taking part in the ELC were, therefore, likely to value their health, believe they were capable of taking part in activity and perceive they had some control over their health. Thus, confirming the utility of using Wallston's MSLT to identify individuals who are likely to participate in a primary care exercise referral programme.

The qualitative findings from Chapter 7 helped to develop an understanding of how HLC beliefs were operationalised by those who initiate and maintain physical activity. HLC beliefs were found to be helpful in understanding exercise behaviour in individuals referred to the ELC. When preventive behaviour was attributed internally and seen as controllable, physical activity behaviour was likely to be maintained. In addition, when HLC was viewed according to Wallston's typology, a combination of internal and powerful others HLC beliefs were found to be useful for supporting behaviour change when individuals were advised to change by a health professional. Those who participated in the ELC were likely to demonstrate a desire for control (to have IHLC beliefs). They felt responsible for taking action based on the advice of their GP and were particularly likely to participate if they were receptive to the advice from their GP. If the advice was communicated in a way which provided good information and motivation, participants were more likely to maintain physical activity after the ELC. Those who participated in the ELC viewed activity as a means of controlling (or coping with) their health problems and as a means of preventing future problems. Thus, suggesting that they had positive outcome expectancies from activity and believed their own actions would influence their health. A desire to prevent future problems contributed to maintenance of physical activity in the longer term. Men participants who demonstrated internal HLC beliefs were more likely than women participants to maintain activity beyond the ELC programme, suggesting that gender mediates the influence of IHLC on

physical activity. The health condition of participants also influenced maintenance of activity (those who were not working due to long-term sickness were likely to continue with activity). In contrast to the participants, those who did not participate in the ELC viewed their health professional as a provider of the solution (or cure) to their health problem and were not prepared to take action themselves. Women non-participants and those who worked were more likely not to want to take action themselves. In general, non-participants did not welcome the referral to the ELC, were not receptive to advice, were not provided with information by their GPs and in some instances, were not told they had been referred. There appeared to be a relationship between CHLC beliefs and age (with those aged over 60 being likely to demonstrate CHLC beliefs) and also gender (with women being more likely to demonstrate CHLC than men). Individuals with CHLC beliefs, who participated in the ELC, also had IHLC beliefs, and those who maintained activity beyond the ELC had these in combination with PHLC beliefs.

Beliefs about health and physical activity (Chapter 8) were found to influence both initiation and maintenance. Belief in capability to participate in activity on the ELC programme had a positive influence on initiation, although was not a pre-requisite for it (some participants initiated activity with doubts about their capability and some non-participants believed they were capable but did not initiate). Likewise, self-efficacy beliefs did not predict maintenance of activity after the ELC programme. They were, however, a key factor in the successful completion of the programme. These beliefs were also found to change (from low to high) when activity was within participant's capabilities and valued outcomes were set realistically and achieved. However, self-efficacy was likely to be negatively influenced by pain, arthritis and mobility problems (conditions that were particularly prevalent in the 65 and over age group). Men were more likely to demonstrate self-efficacy than women. The importance of physical activity in relationship to other aspects of individual's lives was found to influence physical activity behaviour. Family and work commitments were prioritised above physical activity and had a negative impact on both initiation and maintenance. Those who initiated and maintained activity believed it was an important way of achieving valued outcomes, they made time for it and planned it into their lives. However, this was found to be easier to achieve for those who were retired and for men. Whilst individuals generally believed that physical activity is

beneficial for health, they did not necessarily believe they would obtain benefits from it. In order to initiate activity, participants needed to believe they would obtain some valued benefit from it. Maintenance of activity for the duration of the ELC programme was positively influenced by the achievement of valued benefits (and these outweighing any negative consequences, such as stress of fitting activity in with other commitments like work and family). Negative feelings about the activity environment were particularly important influences on maintenance of activity for men (and were likely to lead to drop out, even if other valued benefits were obtained). Maintenance of activity was positively influenced by realistic expectations of capabilities and benefits and realistic beliefs about the timescale required to achieve them (especially by benefits being viewed as long-term). A belief that physical activity may cause harm had a negative influence on the initiation and maintenance of activity. Experiencing harm contributed to drop out before the end of the programme and also to failure to maintain activity beyond it. Maintenance was achieved if participants were able to overcome a fear of harm. This was done via obtaining on-going support with activity or maintaining the activity that was advised by the ELC staff. Beliefs about activity being enjoyable had a positive influence on initiation. Actually finding it enjoyable positively influenced maintenance beyond the end of the programme, although this factor did not ensure maintenance. However, finding activity enjoyable was a key factor in the completion of the ELC programme. The social aspects of the ELC contributed to enjoyment (men particularly believed that competitive activity facilitates enjoyment). Perceptions of health were found to influence physical activity. Those who talked about their health in a negative way were more likely to initiate activity (indicating that a belief that there is a health problem has a positive influence on initiation of activity on the ELC). In fact, being concerned about health was found to have a positive influence on initiation of activity. Women who participated in the ELC were more likely than the men to speak about their health in a negative way. They were generally more concerned about their health than men, although men were more concerned about cardiovascular problems and premature death.

The orientation that individuals had towards time was also found to influence physical activity behaviour (Chapter 9). Initiation was positively influenced by an orientation that looked forwards in time and focused on improving the current

situation, preventing future problems and controlling solutions. When participants looked forwards in time the benefits that were anticipated to result from the activity (as opposed to a focus on the negative consequences) were found to have a positive influence on initiation of activity. Demonstrating a long-term view of health was also found to have a positive influence on initiation of physical activity (particularly acknowledging the need to maintain activity over time in order to achieve valued benefits that may not be realised in the short-term). Perceptions of illness as being long-term in duration also positively influenced initiation of physical activity. Ability to think long-term and to endure the negative short-term consequences of activity was found to support maintenance. Willingness to attribute the solution of their problem to themselves had a positive influence on physical activity behaviour (participants believed their own actions could influence their health). Maintenance of activity was facilitated when participants took a longer-term view of both health and physical activity. It was also facilitated when they were able to cope with, and recover from, lapses in activity due to the ebb and flow of illness and other commitments. Men who took part in the ELC were more likely to view time as unlimited, whereas women viewed it as constrained by other demands.

10.5 Synthesis of key issues

10.5.1 Age

Findings from the thesis suggested that age is an important factor influencing physical activity behaviour (and that it does this via its mediating influence on a number of other factors). The review by Trost *et al.* (2002) confirmed that age has been found to be one of the most consistent demographic correlates of physical activity behaviour in adults. Findings from the thesis confirmed this (as the age of Wirral adults increased levels of physical activity were found to decrease). The evaluation of the ELC showed that whilst the over 65's were significantly more likely than the other age groups to increase their levels of activity when on the programme, they were still significantly less likely to meet the recommended levels of physical activity. Marcus *et al.* (2000) also found sedentary behaviour to be more prevalent in older adults. The lower levels of activity in older adults might be explained by a number of factors. Older adults have been found to have attitudinal barriers towards physical activity, such as misconceptions or erroneous beliefs about it (King, 2001; Wilcox & Storandt, 1996). They also cite injury (e.g. Booth *et al.*,

1997; O'Brien Cousins, 2000) and poor health as barriers (Booth *et al.*, 1997; King, 2001) and expect fewer benefits from taking part in activity (Wilcox & Storandt, 1996; Yael & Shulamith, 2004). Older people may, therefore, feel that it is too late to make any improvements in health through exercise because they think declines in health are inevitable and irreversible with age. They may also view old age as a time of rest and relaxation and, therefore, lack the motivation necessary to initiate and maintain regular exercise. Wilcox and Storandt (1996) found that age was negatively associated with attitude towards exercise and exercise self-efficacy. The qualitative study in this thesis found that self-efficacy beliefs were negatively influenced by pain, arthritis and mobility problems (conditions that were most prevalent in the over 65 age group). Age has also been found to be negatively associated with self-efficacy beliefs in the chronically ill (Schieman & Campbell, 2001).

The thesis found that the 65 and over age group was significantly more likely than the younger age groups to adhere to the ELC programme. This might be explained by the difference in barriers faced by young and older adults. Whilst older adults have been found to cite injury and poor health as barriers, younger ones cite child responsibilities, lack of time and lack of motivation (Booth *et al.*, 1997). Adults over 65 have also been found to report less fear and anxiety about illness and to reduce risk and emotional distress via problem-focused coping (Leventhal *et al.*, 1993). In fact, exercise has been found to be used as a coping strategy and to be correlated with problem-focused coping (Ingledeew *et al.*, 1996). Aldwin (1991) has suggested that older adults are better than younger ones at coping with difficulties and use a range of strategies to deal with their health problems. Whereas, the most common coping strategies for middle aged adults have been found to be avoidance and delay (Leventhal *et al.*, 1993). Referrals into the ELC were twice as likely to come from the middle age group (35 to 64), confirming research by Harrison *et al.* (2005). This age group was the one reporting the greatest number of CHD risk factors. Van der Bij *et al.* (2002) have also found that age does seem to influence participation in physical activity interventions. The qualitative study in this thesis, found that those who did not initiate activity were, in general, younger than those who did. This difference in age profile may explain why the two groups viewed the relative importance of activity in different ways. Young people may not be

concerned with long-term health problems (especially if they do not perceive their health condition is serious). Therefore, they may not believe that physical activity, as a means of maintaining or preventing health problems, is important to them. Those who did not initiate activity (the younger group) tended to focus on short-term, immediate benefits of activity such as weight loss, rather than considering how activity is good for the heart and mobility (as the older participant group did). Young people were also more likely to be working which meant that not only was fitting physical activity in to their daily lives difficult, but attending supervised sessions on the ELC was problematic. Indeed, it was the retired group that was most likely to complete the ELC programme and to find it easier to make time for physical activity.

Findings from the thesis indicate that age has an influence on physical activity behaviour via its mediating effect on control beliefs. The over 65 age group was significantly more likely than the other age groups to have high PHLC beliefs, the 35 to 64s were significantly likely to be pure internals and the under 35s were low on PHLC and CHLC beliefs. Age differences in control beliefs may reflect life-span related changes such as health-related physiological changes becoming more evident and less controllable (Nurmi *et al.*, 1992). Lachman (1986) found that the elderly acknowledge the importance of external sources of control, yet at the same time, preserve their sense of internal control. Older adults with more than two chronic conditions have also been found to have higher PHLC and CHLC scores (Bell *et al.*, 2002) and those with chronic illness have been found to report lower IHLC beliefs than older healthy adults (Frazier, 2002). Studies have also found that an interest in health increases with age and thinking about health becomes more external with age (Nurmi *et al.*, 1992).

10.5.2 Gender

The findings from the thesis highlighted that gender is another important factor that influences physical activity behaviour (and that it does this via its mediating influence on a number of other factors). Findings from the survey showed that, in the general adult population of Wirral, men were significantly more active than women. Indeed, gender has been found to be correlated with physical activity behaviour in adults, with activity being consistently higher in men (Troost *et al.*,

2002). This may be due to the different barriers that men and women have to participating in physical activity, with women being more likely to report emotional and motivational barriers and lack of energy (HEA, 1992). Whilst both men and women perceive that time is a barrier to physical activity, for women this is likely to be due to looking after family whilst for men it is due to work (HEA, 1992). The qualitative study confirmed that men found it easier to make time for physical activity and to plan it into their lives. Men were likely to view time as unlimited, whereas women viewed it as constrained by other demands. However, it is possible for women to overcome barriers relating to family and domestic commitments if they are able to develop an identity as an exerciser (Hardcastle & Taylor, 2005). The evaluation of the ELC found that women were twice as likely as men to be referred into the intervention. This may have been because women experience their conditions differently to men (Hunt *et al.*, 1999) and are, therefore, likely to consult their GP more frequently than men (e.g. McCormick *et al.*, 1995). Indeed, diagnosis by a GP has been found to be influenced by the way in which symptoms are perceived by the patient (Sayer & Britt, 1996). Findings from the qualitative study indicated that women were more likely than men to talk negatively about their health and, in general, they were more concerned about their health than men (although men expressed concern about cardiovascular problems and premature death). It has also been suggested that women seem more able than men to select appropriate coping mechanisms for dealing with health problems, and to use vigilant strategies when their health is threatened, which may increase the likelihood of women seeking medical care early (Weidner & Collins, 1993).

The evaluation found that men and women differed in their referral conditions. Women were more likely to be referred for stress, obesity and arthritis, whilst men were referred with high blood pressure, breathing problems, diabetes and previous cardiovascular problems. The qualitative study also found that in the participant group, men were more likely than women to be concerned about cardiovascular problems resulting in premature death whilst women were more concerned with musculoskeletal problems. Other studies also confirm that women are more likely to be referred to interventions with musculoskeletal conditions and men with cardiovascular disease risk factors (Harrison *et al.*, 2005). Pain often accompanies musculoskeletal conditions and this has been found to be a factor that leads people to

consult their GP (Hunt *et al.*, 1999). This would provide another explanation for women's greater level of referral into the ELC when compared to men. Chronic illness has been found to present different challenges for men and women in terms of their traditional gender roles (Helgeson & Reynolds, 2002). The traditional masculine male may be the most vulnerable to non-compliance with medical advice due to features such as independence, self-control and difficulty in expressing emotions and vulnerability. The traditional female gender role may lead to conflict between focusing on their own health and caring for others. These gender differences may provide some explanation as to why studies have found women to have lower self-efficacy than men (Clarke & Eves, 1997; Yael & Shulamith, 2004) and men to be more confident than women of completing an exercise prescription (Clarke & Eves, 1997). In fact, findings from the qualitative study showed that men were more likely to demonstrate self-efficacy than women. However, the studies in the thesis did not find any significant gender differences in adherence to the ELC or in levels of physical activity (although men were more likely to meet the recommended levels of activity). However, some significant gender differences in control beliefs were found. Men had significantly higher PHLC beliefs than women, which may be indicative of the different health problems they faced (with men being more likely to have life threatening disease and women having musculoskeletal problems).

10.5.3 Health perceptions

The findings from the survey confirmed that self-assessment of health in general is a powerful indicator of actual health status, or mortality (Idler & Benyamini, 1997). It predicted which respondents were likely to meet the recommended levels of physical activity and also which referees were likely to successfully complete the ELC programme. However, there appeared to be some contradiction between the quantitative and qualitative findings relating to health perceptions. There were differences between the way people talked about their health and how they rated it on a likert scale. In particular, the quantitative findings showed that those rating their health as good or better than good were the ones significantly more likely to meet physical activity recommendations and to complete the ELC programme. However, in the interviews, those who talked about their health negatively were more likely to initiate activity. This finding would appear to support literature that

says, when people rate themselves on a quantitative scale, they consider many different factors, including their own values, before deciding on a rating (Bergner & Rothman, 1987). One factor that they have been found to take into account is their ability to be physically active (Benyamini *et al.*, 2003). A high self-assessment of health (which predicts adherence to the ELC programme) may, therefore, be indicative of a high level of self-efficacy and a belief that an individual has the ability to participate in physical activity. The qualitative findings showed that a belief that there was a health problem, and being concerned about this, had a positive influence on initiation of activity. In addition, perceptions of illness as long-term in duration positively influenced initiation of activity on the ELC. Williams, Wasserman & Lotto (2003) point out that perception and reporting of health status are central to health self-regulatory behaviour (e.g. deciding when to take medication, when to seek health care). They assert that self-assessed health is the primary means by which people communicate with healthcare providers, which in turn affects the care they receive. This may help to explain why those who talked about their health in a negative way were more likely to initiate activity (i.e. they communicated this concern to their GP who consequently offered motivation to exercise and referred them to the ELC). The fact that women were more likely than men to talk about their health in a negative way may also explain their high level of referral into the ELC programme, when compared to men.

It has been suggested that those who have higher levels of self-assessed health (as those who were likely to complete the ELC did) may suffer from some health problems, but are not seriously sick (Benyamini *et al.*, 2003). These people may be judging their level of health, in contrast to those who rate their health as fair/poor who are ill people mainly judging their levels of illness. Indeed, how people view their symptoms (or illness representations) has been found to influence perceptions of health (Dishman, 1982). There was evidence from the interviews that symptoms affected the initiation of, and adherence to, physical activity. This supports the findings of Leventhal, Diefenbach and Leventhal, (1992) where symptoms are also suggested to change over time, resulting in the constant updating of individuals' appraisal and coping processes. How people felt when they were first referred to the ELC programme, in terms of their symptoms, had an impact on whether they started activity or not (the referral had to be at the right time for them). Symptoms also had

an impact on self-efficacy, in particular participants were likely to stop activity when symptoms were bad and they did not feel capable of exercising. Some were likely to re-commence activity when the symptoms eased (e.g. pain) whilst others were likely to drop out and discontinue activity. Those who continued are suggested to have greater levels of self-motivation, or perseverance and willpower, as found by Dishman *et al.* (1980).

10.5.4 Self-efficacy

Self-efficacy was found to play an important role in enabling individuals to maintain activity behaviour for the duration of the programme. Other studies have found that those in the maintenance stage of behaviour change exhibit the highest levels of self-efficacy (Marcus & Owen, 1992). However, it was not necessary to hold strong beliefs in capability to exercise on the programme in order to start activity. The distinction between self-efficacy at the different stages of behaviour change may have been contaminated or eliminated by the nature of the GP intervention (Clarke & Eves, 1997). If non-participants doubted their self-efficacy but attempted activity, they dropped out soon afterwards because they gave up easily when they met set backs or did not obtain results quickly (Bandura, 1997). These failure experiences would have undermined feelings of efficacy (Rothman, 2000). On the other hand, participants who initiated activity with low efficacy beliefs were more likely to persevere because they valued the outcomes, were more realistic in their goals and also believed that it would take time for outcomes to materialise. They were, therefore, likely to persevere long enough to find they were capable of participating in activity and, consequently, their perception of self-efficacy changed. It is not surprising that individuals who initiated activity on the ELC did so with varying levels of belief in their capability. This was probably because they had been sedentary in the past and would not have had realistic perceptions of control over their behaviour (Norman *et al.*, 2000) and would also have been poor judges of their personal level of control (Armitage, 2003). Evidence from the participant interviews showed that not only does self-efficacy have a role in determining behaviour, but also that behaviour can determine self-efficacy (as advocated by Garcia & King, 1991; Rothman, 2000). Through the process of exercising, self-efficacy perceptions may change from low to high. However, if they do not change, as was the case for some non-participants who initiated activity, then behaviour change will not be

maintained. Self-efficacy was not found to determine longer-term behaviour change (a number of those who completed the programme failed to maintain activity after the programme). It is, therefore, suggested that whilst self-efficacy is particularly important in short-term maintenance, other factors play a role in the longer-term maintenance of activity. Fatigue and aches and pains have been suggested to lead to lower self-efficacy beliefs (Bandura, 1977b) and findings from this thesis confirmed that self-efficacy beliefs were negatively influenced by pain, arthritis and mobility problems.

10.5.5 Outcome expectancies

Findings from the qualitative study highlighted the importance of outcome expectations as an influence on initiation and maintenance of physical activity. A belief that a valued benefit would result from physical activity had a positive influence on initiation, whilst achieving a valued benefit had a positive influence on maintenance. Beliefs about the outcomes from physical activity have been found to be significantly correlated with physical activity behaviour and the belief that physical activity will promote health is a factor that has been suggested to be required in order to perform a behaviour (Norman, 1995). In fact, Norman (1995) suggested that it is more important for individuals to believe that the behaviour will promote their health than to believe that they have control over it (they are capable of achieving the behaviour and that it will produce valued outcomes). However, outcome expectations have also been found not to predict physical activity behaviour over and above self-efficacy. This is because all individuals have been suggested to expect some reward from physical activity and, therefore, outcome expectations may provide the incentive for other cognitive mechanisms to mediate physical activity behaviour (Dzewaltowski, 1989). Findings from the thesis showed that it was particularly those participants who had realistic expectations about the benefits they could achieve, and also had a realistic time scale attached to these outcomes, who maintained activity after the ELC programme. They did not expect to see immediate results but believed that physical activity was important for their future well being. Time perspective (with respect to how close or distant in time the benefits were perceived to be), therefore, had an influence on physical activity behaviour. It has been suggested that people typically assign less importance to outcomes in the distant future than in the present, thus, they may assign little importance to future

health consequences when deciding how much time to spend in physical activity (Cawley, 2004). This is suggested to have been the case for individuals who did not maintain activity. In addition, the time that individuals spent on the ELC programme affected the benefits that were gained (thus, highlighting the importance of a time component in the study of physical activity behaviour). In fact, non-participants gave up fairly quickly and, therefore, did not see any benefits. They were likely to focus on short term benefits, such as weight loss, whereas those who maintained activity beyond the end of the ELC programme were likely to focus on long term benefits, such as prevention of future health problems.

Outcome expectations in terms of the negative consequences of physical activity were found to be a barrier to physical activity initiation and maintenance (this is discussed as part of the barriers sub section 10.5.8). However, it is worth noting that active individuals have been found to counter every negative thought with a strong positive dialogue and every barrier with a solution (O'Brien Cousins, 2003). There is some evidence from the thesis to suggest that this is what those who maintained activity after the ELC programme did. However, a decision to initiate a new behaviour may well be dependent upon whether favourable expectations about future outcomes are held, whereas maintenance depends on perceptions of satisfaction and whether it is sufficiently desirable enough to warrant continued action (Rothman, 2000). The qualitative study indicated that if people reached their goal (e.g. completed the ELC) and were satisfied with this, there was then no motivation to continue. In contrast, participants who continued with activity after the ELC were satisfied with what they had achieved, but still wanted to achieve more (i.e. were still dissatisfied with their current standing). It is also suggested that their motivation (or incentive) to participate was greater than those who stopped activity because they expected future dissatisfaction if they were to discontinue physical activity during or after the ELC programme. This would support research by Dzewaltowski (1989) who found that people who were satisfied with outcomes exercise more than those who were less satisfied. Findings from the qualitative study also showed that enjoyment is an outcome expectation from physical activity (it may be a factor that contributes towards satisfaction). It is something that had a positive influence on both initiation of activity and completion of the ELC programme. Enjoyment was found to support participation in physical activity (HEA, 1992), to be influenced by

the social aspects of physical activity (Paxton *et al.*, 1997) and social support in the physical activity environment (McAuley *et al.*, 2003). Enjoyment may also have influenced self-efficacy beliefs and supported individuals in completing the ELC (positive feeling states have been found to increase self-efficacy beliefs) (McAuley *et al.*, 2000). Enjoyment is also discussed under barriers (section 10.5.8).

10.5.6 Health locus of control

Individuals who had an internal HLC were the group most likely to participate in the ELC programme. This indicates that those who initiated activity believed they had some control over their health through their own actions (Lefcourt, 1976; Wallston & Wallston, 1981). It also shows that HLC is an important determinant of initial involvement in exercise (as suggested by Dishman, 1982). Others have also found that individuals with pure IHLC beliefs performed the most health behaviours (Norman *et al.*, 1998) and have suggested that an individual is unlikely to engage in health behaviour if they do not believe their health is controlled by their own behaviour (Wallston *et al.*, 1987). Having a strong belief in the role of powerful others also had a positive influence on physical activity behaviour in individuals referred to the ELC (which supports research by Wallston, 1989). However, it was a combination of IHLC and PHLC beliefs that was particularly important in positively influencing completion of the ELC programme. This provides evidence to support the suggestion that PHLC beliefs indicate a receptivity to the health message (Norman *et al.*, 1998) and may be particularly relevant to illness behaviours (Wallston, 1992). In addition, it supports the suggestion that when individuals have been advised to change by a health professional, a combination of IHLC and PHLC beliefs are particularly important in supporting behaviour change. Individuals are both receptive to the health message and are also able to translate this advice into behaviour change (Wallston & Wallston, 1981; 1982). In fact, adherence in those with chronic conditions has been suggested to be predicted by perceptions of control that combine internal and external beliefs (Wallston, 1992). These people seek to achieve control via a partnership between themselves and their health professional. HLC, therefore, provided a useful way of understanding how individuals at risk of CHD would respond to a preventive health message and the way in which they would respond (as suggested by Bell *et al.*, 2002).

The quantitative study (Chapter 5) found that control beliefs were influenced by age (this is discussed in the age section 10.5.1). Indeed, self-mastery (part of IHLC) has been found to decrease with advancing age (Marshall, 1991). This finding also supports previous research that suggested that dimensions of HLC were not able to fully mediate the influence of age (and also gender) on exercise behaviour (Norman *et al.*, 1997). It is also possible that HLC beliefs were partly determined by health status (as suggested by Wallston, 1992). For example, those in the under 35 age group (with the least number of health problems) were most likely to have low PHLC beliefs along with a chance orientation. Levels of illness have been found to influence HLC beliefs, with the chronically ill being more externally orientated (e.g. Frazier, 2002; Marshall, 1991). Wallston *et al.* (1987) have also pointed out that the consequences of holding certain HLC beliefs can not be dealt with without taking individuals health into account (e.g. are they ill and attempting to recover/cope/adapt or are they well and trying to remain healthy). The findings from the thesis indicate that preventive behaviour that is attributed internally and seen as controllable, should be more likely to be maintained (which supports the proposal by Wallston *et al.*, 1987). Those participants who successfully completed the ELC viewed activity as a way of controlling (or coping with) their health problems and as a means of preventing future problems. A desire for prevention was particularly important in positively influencing maintenance of activity after the ELC programme.

Locus of control refers to expectations over outcomes. However, health is just one outcome of physical activity behaviour. Outcomes other than health (such as enjoyment) were found to influence physical activity (which supports suggestions of Wallston, 1992). Even those who place a high value on their health might have stronger, competing reinforcements for engaging in unhealthy behaviours (Walker, 2001). However, valuing health highly appeared to provide an incentive to initiate activity on the ELC. This may have been because participants had lost, or were under threat of losing, their health (as suggested by Walker, 2001). This may help to explain why locus of control has been suggested to be more relevant to illness behaviours (Wallston, 1992). It may be that, only when illness strikes, does the impetus for engaging in behaviours to restore health exceed that of other more immediate and certain pleasures of life (Walker, 2001). Indeed, factors that determine health behaviour in the most immediate and short term have been

suggested to be the most powerful (Bandura, 1977b). However, findings from the thesis showed that it was those individuals who valued the longer-term health outcomes from activity who were the most likely to adhere to activity after the end of the ELC. Interestingly, Lefcourt (1976) found evidence that internally orientated individuals are more likely than externally orientated ones to defer immediate benefits in order to carry out long-ranging plans. Those who dropped out of the ELC focused on value of activity in terms of the short-term outcomes, rather than outcomes that were distant in time and probably the most difficult to achieve (suggesting their internal beliefs were less strong than those who adhered). Walker (2001) found that whilst people strive to achieve an outcome if it has value for them, it is not only the value of the outcome that influences the likelihood of behaviour, but its immediacy and certainty. Health outcomes, no matter how desirable, are neither immediate or certain (Walker, 2001).

10.5.7 GP influence

Those individuals who participated in the ELC were particularly receptive to the advice of their GP and demonstrated that they felt responsible for taking action based on this advice. This indicates that the GP influenced physical activity behaviour. However, it was the way in which the GPs communicated with their patients that influenced whether they participated in the ELC programme. In addition, if the patient received advice that included good information and motivation, he/she was likely to maintain physical activity after the ELC. However, there was also evidence that some participants associated referral from their GP as a temporary 'fix' associated with illness, similar to a prescription of medicine. The idea of being on an exercise programme may, therefore, have implied that at some point in the future it would cease. In fact, failure is often the natural endpoint (Buckley *et al.*, 1999). It is possible that the way in which some health professionals referred people to the ELC resulted in participants feeling a diminished sense of perceived control. The health professional may have taken responsibility for the solution and, therefore, removed control over the outcome from the participant. The participant may, therefore, have merely equated their prescription to a course of medication and not considered continuing with exercise, just as they would not consider taking a second course of tablets unless they had been prescribed. Findings from Moore *et al.* (2004) showed the importance of involving patients in their health care treatment and

illustrated that patients' experience of medical professionals has a significant impact on whether they seek and adhere to medical treatment. Evidence from the thesis showed that a complete lack of GP communication was only evident in the non-participant group. This is suggested to have contributed to an unwanted referral into the ELC programme and failure of the individual to initiate activity (i.e. non-adherence).

10.5.8 Barriers

Health problems and illness were the most frequently cited reasons for failure to complete the ELC programme. In addition, participants who successfully completed the ELC cited physical barriers (e.g. deterioration in health, pain, injury, and being too overweight) as reasons why they had not maintained activity after the programme. Indeed, symptoms such as pain have been found to be a significant barrier to physical activity (Clark, 1999). Injury has been found to be the most common reason for relapse from exercise (Sallis *et al.*, 1990) and also appears to be a strong influence on maintenance and drop out from regular physical activity (Hofstetter *et al.*, 1991). Whilst supervised exercise programmes have been found to reduce the risk of injury (e.g. Buchner & Coleman, 1994; Timpka *et al.*, 2005) these programmes often exclude adults who have a risk of health problems or high risk of injury. However, the participants on the ELC had a range of health problems and were particularly susceptible to injury. Middle aged sedentary adults, particularly those who are overweight and unfit have been found to be particularly susceptible to injury from high intensity exercise, such as fast paced walking (Pollock, 1998). The physiological feedback from this activity (e.g. increased heart rate and shortness of breath) may be perceived negatively by sedentary individuals, leading them to believe regular exercise would be difficult for them to achieve. Research findings suggest that, as yet, researchers do not know enough about how to minimise the risk of injury from physical activity (e.g. Marshall & Guskiewicz, 2003). Injury is something that has been shown to affect adherence to physical activity (Dishman & Buckworth, 1997). This is especially so if individuals suffer pain and are concerned about re-injury (Verbunt *et al.*, 2005). The consequences of injury, especially for older adults, can create many other associated problems. Fear of injury is, therefore, a very valid concern for those who are unused to exercise and the qualitative findings from this thesis demonstrated that this had a negative influence on maintenance of

activity after the ELC programme. In particular, a belief that physical activity may cause harm had a negative influence on both initiation and maintenance of activity after the programme.

A belief that physical activity was not going to be enjoyable was a barrier to initiation of physical activity on the ELC programme and failing to find it enjoyable was a barrier to completion of the programme. Failure to find the activity environment enjoyable also had a negative influence on maintenance of activity. This confirms research by Sallis *et al.* (1989) who identified that not finding exercise enjoyable was a prominent barrier and dislike of exercise was a significant predictor of lack of behaviour change. Feeling uncomfortable or lacking confidence in the exercise environment may also have a negative influence on the enjoyment of exercise. However, if individuals feel comfortable, they may be able to build up feelings of efficacy by observing the achievements of others and seeing others who are similar to them coping with exercise. The exercise programme itself may also influence enjoyment. If it is simple, convenient to engage in and provides opportunity for social interaction, adherence to exercise is suggested to improve, particularly in older adults (King, 2001). If the exercise environment provides opportunity for social interaction, perceptions of capability may also be enhanced (e.g. McAuley *et al.*, 2000; Turner *et al.*, 1997). In addition, convenience and accessibility of the exercise setting has been found to have a major influence on adherence (Dishman, 1982). Wallston and Smith (1994) found that patients with a high desire for control over their healthcare setting needed choices that met their needs. The restricted choice of exercise setting available on the ELC programme and the limited opportunity for social interaction may, therefore, have had a negative influence on participation for some individuals.

Another barrier to initiation and maintenance of physical activity was the perception that time was constrained by other demands, particularly by work and family commitments. These two factors had a negative influence on both initiation and maintenance of activity. Even if some non-participants had a strong sense of self-efficacy and believed they would benefit from activity, work was a significant factor that prevented them from initiating exercise. The limited time available to those who worked and cared for family may explain why they had unrealistic expectations

about the time required in order to achieve the benefits from physical activity. In fact, having unrealistic expectations about the time required to achieve benefits was found to have a negative influence on completion of the ELC programme.

10.6 Limitations and future work

Staffing, facilities and process have been suggested to influence leisure centre-based exercise programmes like the ELC (Taylor, A., 1999). Indeed, each of these factors presented limitations to the research that was undertaken for this thesis. The ELC exercise advisers were all new exercise physiology graduates who had a narrow focus on fitness and no skills in working with individuals with health problems. These factors probably contributed to the generally low credibility of the scheme with GPs and its eventual discontinuation. Whilst exercise facilities were available throughout Wirral, access to the exercise advisers was only during restricted hours, which limited the ability of those referees who worked full time to take advantage of full support and supervision. The support of the advisers may have been particularly important in helping referees to set realistic and obtainable goals. Therefore, adviser support is suggested to have influenced adherence to the ELC programme. In terms of the process of the ELC, it was limited by restricted and time limited funding. The findings (in terms of adherence to the ELC) would have been influenced by the advisers (this was not controlled for within the study). These factors meant that difficulties were encountered in developing an evaluation that was acceptable to the exercise advisers, that there were limitations in the data that could be collected and the time frame within which this was able to be collected. The facilities that were available for exercise participants (i.e. the exercise environment) would have also had an impact on the findings. For example, the facilities themselves and their ability to offer social interaction would have influenced participants' enjoyment. These issues suggest a number of areas for future work. For example, it may be useful to explore how GPs perceptions about primary care exercise referral schemes could be improved. Referral rates by GPs could be investigated and also adherence rates by referrer (to explore the effectiveness of face to face referrals and where these need to be improved along with how these could be improved). In addition, future work could consider ways to increase enjoyment (e.g. looking at the activity, the activity environment, developing perceptions of self-efficacy, managing risk of injury, overcoming barriers and providing opportunities for social interaction). It

could also explore how interventions can provide better support to those who work full time.

The evaluation of the ELC was limited by the nature of an applied study. One of these limitations was the availability of resources, in particular time. The evaluation relied on the exercise advisers to administer and collect questionnaires and this process was affected by demands on their time and their commitment to evaluation. In addition, there were a large number of referrals entering the ELC each week (approximately thirty each week) and a continually increasing case load for the six advisers (they were likely to give extensions in time to participants who needed to stop and restart). As a consequence they also had limited time to spend with each participant individually, which would also have influenced adherence to physical activity. It is suggested that future evaluation work might focus on smaller numbers of participants (ideally referral numbers should be smaller) or focus on sub-sets of the individuals referred into the intervention (e.g. explore the experiences of women, of older adults or those with specific health conditions).

Another limitation, caused by the nature of an applied study, was that the focus of the ELC programme changed, necessitating changes in the evaluation. The focus of the programme evaluation shifted from process evaluation in terms of number of participants completing the programme to physiological outcomes. In many instances, both diet & exercise advice were given to participants and participants were also taking medication which may have changed during their time on the ELC (this was not documented by advisers). It was, therefore, not possible to attribute the physiological results to a specific component of the ELC. Thus, this thesis did not report the physiological changes in ELC participants (although these were an important concern for the management of the scheme). The evaluation was also limited by the difficulty of incorporating triangulation into the design. Measures of physical activity were obtained both from participants and from the leisure centre computerised booking in system. However the Leisure centre system was flawed and unable to generate reliable data on the frequency and duration of participants' activity. An attempt was made to include GPs in the evaluation, however, the response rate to a survey was extremely poor and it became apparent that GPs received little feedback from their patients after they had referred them (this data is

not reported in this thesis). However, since the thesis aimed to understand the personal perspective of people with respect to their physical activity behaviour, triangulation may not have been appropriate anyway. Having said this, it would be interesting for future work to include the GP in the evaluation of exercise referral schemes. Future work could also focus more on how people feel whilst on a scheme like the ELC and explore a wide range of exercise experiences, both positive and negative.

Findings from the evaluation of the ELC (Chapter 4) showed that whilst there were small improvements in physical activity in the short term, these were not sustained over the longer term. This raises issues about the cost effectiveness of using exercise referral schemes to promote lifestyle change. Indeed, whilst Wirral has a policy to improve the health and lifestyles of its population, increasing levels of physical activity is just one aspect of this. The decision to discontinue the ELC was based on the costs being perceived to exceed its long-term benefits. The PCT decided to fund obesity management as a primary project, with a focus on dietary advice and the promotion of physical activity taking a secondary role. This decision was partly based on the evidence generated by the ELC evaluation as well as PCT budgetary policies. However, the quality of evidence provided by the ELC evaluation may have been negatively influenced by a number of factors, including the appropriateness of referrals, variability in the exercise advisers and leisure centres and the pre-post design of the evaluation. Therefore, this evidence may not have been a true reflection of the cost-effectiveness of exercise referral schemes, which if managed according to the NQAF guidelines, may have provided a more positive picture of cost-effectiveness.

The use of a randomised control trial as opposed to a pre-post design may have produced better quality evidence on which to make an assessment of cost-effectiveness. In particular, it would have reduced any scepticism in the findings by clearly stating elements such as recruitment strategies, inclusion criteria and standardised components for the intervention (e.g. exercise advisers and leisure centre facilities). Policy makers may have also been sceptical about the potential bias inherent in excluding data on individuals who were lost to follow up. They may have assumed a negative outcome for these individuals, indicating a negative effect

on cost-effectiveness. In fact, there are implications of reporting data only for those who complete assessments. This is in terms of overestimating the impact of the intervention. A way of overcoming this would have been for the evaluation of the ELC to adopt an 'intention to treat' analysis. This would have involved inputting any missing data at follow-up assessments (taken from the previous assessment) in order to retain the internal validity of the findings. In the case of a randomised control trial, an intention to treat analysis may have made an assumption that those lost to follow-up in the intervention group would have had a poor outcome, whilst those lost to follow-up in the control group would have had a good outcome.

One other limitation of the thesis relates to the measures that were used in the studies. One measure was that of physical activity. The difficulty of using self-report measures for physical activity and how they may not accurately reflect actual patterns of exercise has been discussed in Chapters 3 and 5 (see 5.4.4). The exercise advisers also interpreted participants' self-reports of activity and this may have compounded the problem of gaining an accurate measurement (particularly since advisers were monitored on the number of participants they successfully enabled to increase activity and complete the ELC programme). In addition, when people report their activity levels, they tend to do so over a brief period of time (e.g. the past two weeks). It is therefore not clear how well this represents people's general activity levels over several months, and it then becomes important to assess the length of time people were regularly active as well as the prevalence of activity. Thus, it is suggested that future work should explore different options for measuring activity behaviour. Other measures may also have limited the findings from the thesis. For example, Lau *et al.*'s health value scale may fail to capture the value that individuals place on short-term health gains. In addition, a health specific locus of control scale, such as Wallston and Wallston's (1981) MHLC scale, assumes that health is the primary reinforcement for physical activity, when in fact, it may not be. The limitation of each of these measures has been discussed in detail in Chapter 5, 5.4.4. Future work might consider undertaking further structural equation modelling in order to assess the relationships between factors in Wallston's MSLT, factors that were found to be significant from the survey (e.g. age, gender etc) and physical activity behaviour.

Future work might also consider other ways of measuring self-efficacy. The limitations of the measure of self-efficacy used in the quantitative studies has already been discussed (see 5.4.4), namely its lack of sophistication. In addition, the difficulty of using an exercise specific self-efficacy measure with a sedentary population referred to exercise by a GP, has also been discussed (see 2.15). This includes the possibility that the GP referral may contaminate the self-efficacy measure and that a sedentary individual's estimate of their self-efficacy will be unreliable due to their lack of experience of physical activity. It was argued that the use of a measure of exercise self-efficacy in a previously non-exercising population would have been inappropriate. However, a barriers specific self-efficacy may have proved more appropriate. This measure is designed to tap individuals' perceived capabilities to exercise in the face of commonly identified barriers to participation. Individuals would indicate their degree of confidence (from 0 to 100%) in performing exercise on a regular basis when faced with a series of barriers (such as 'when I am feeling tired', 'during bad weather'). Whilst this is a useful measure, due to the space limitations in the ELC questionnaire, it would not have been practical to use it. However, another way of simply measuring self-efficacy would have been to give a specific target for activity, such as asking participants to indicate how confident they were that they could perform activity five times each week for at least thirty minutes. This may have provided a better indication of their self-efficacy. However, like the measure adopted in the quantitative studies it would also have been susceptible to unreliable estimates resulting from the previous levels of activity performed by participants.

A limitation of the qualitative study was that, by its nature, it was subject to self-selection bias. It was most likely that participants who felt positive about the programme and obtained benefit from it were those who agreed to be interviewed. In addition, the non-participants who consented to participate in the study were often having second thoughts about not participating. They may, therefore, have been those who were already receptive to the idea of participating in the ELC. As a consequence some factors that influence non-participation (and in particular those present in the pre-contemplation stage of behaviour change) may not have been found in the transcripts. The social context of the qualitative study may have influenced the relationship between the participant and the researcher and, therefore,

the way in which participants responded to interview questions. For example, the researcher did not have any health problems and participants may have viewed her as not understanding their condition. Participants may also have perceived the researcher as a health professional and thus, focused their answers according to what they believed a person in this role would want to hear. The age and gender differences between the participant and the researcher may also have influenced the interviews. Whilst the researcher was open to the perspectives of all participants, it is also difficult to overcome the inevitable balance of power relations between those who consent to participate and the researcher who controls the interview and benefits from the research process. Whilst semi-structured interviews provide a means for respondents to give a rich picture of their beliefs and perceptions they also have disadvantages. For example, respondents may give answers with a focus on being a good interviewee or use language to impress the interviewer and convince them of their expertise. This may bear no relationship to a factual record or to their beliefs. Indeed, the adoption of a phenomenological perspective makes the assumption that what a respondent says has some ongoing significance for them and that there is some relationship between what they say and the beliefs or psychological constructs that they hold. In addition, since the qualitative study is a piece of interpretative work, it was vulnerable to the biases and subjectivity of the researcher.

In interpretive research the role of the researcher is crucial. This is because engaging with the data relies on their social skills and capacity to creatively interpret and uncover meaning in the data. The qualitative study in the current research was influenced by the unique attributes of the researcher. These included a background in working with figures. This influenced the way in which the qualitative data was analysed and presented. In particular, a grounded theory approach and presenting the data as themes was appealing to someone with a numerical background. The selection of themes was also influenced by the fact that the researcher had no prior experience in the promotion of physical activity before undertaking the study. This meant that there were no pre-conceived ideas about what would emerge from the data. It was an interest in health locus of control and the ongoing literature review (that was carried out alongside the data collection) that guided the choice of themes. At the start of the research journey certain decisions were made based on the researcher's level of understanding about the subject at that particular point in time.

For example, what measures to use for physical activity. However, as the research progressed and knowledge and understanding increased, previous decisions were re-assessed and questioned. This resulted in data being looked at and analysed in different ways. A continual process of reflection took place along the research journey. This process culminated in knowledge and understanding about physical activity that would enable a different and more informed research design to be adopted in the future.

The qualitative study could be perceived to be limited as a consequence of the approach that was used to present the data. Due to the large amount of data that was generated from the thirty two interviews it was necessary to present the data in themes. Some researchers would perceive this to be a 'mechanistic' approach to data presentation. Another way of looking at the experiences of study participants would have been to adopt a more ethnographic, case study approach. In presenting the data as case studies the richness and cohesion of each individual's story would have been clearly shown. However, it would not have been feasible to present thirty two individual case studies as part of this thesis. If a different sampling strategy had been adopted, yielding a smaller number of participants, it would have been possible to present the data in a different way. This could have been achieved via choosing interviewees with a view toward finding things that might challenge the emerging theory. A decision about where to sample next would have been based on previous findings. The emerging themes and theory would have guided further data collection and sampling would have ended once theoretical saturation of a theme had been obtained and additional data did not broaden a theme.

10.7 Conclusions

Exercise behaviour is a result of the combination of social, biological and psychological factors (Burk & Kimiecik, 1994). The examination of any one variable will not, therefore, be able to account for large amounts of variance in behaviour. Health locus of control (HLC) is just one of a number of variables in a causal chain that predict health behaviour. However, it would appear that there is some utility in using the HLC concept to explain the general tendency to engage in a primary care exercise referral scheme. Determining an individual's HLC orientation may also help providers of interventions to tailor them to participants' needs.

However, “human behaviour is complex and multidetermined” and “the HLC scales are not the magic panacea many people believe they are” (Wallston & Wallston, 1981, p.236). Therefore, it is when HLC is used along with other factors, that it provides a useful way of understanding exercise behaviour. HLC, particularly when considered as an eight type typology (Wallston & Wallston, 1981), was found to be a useful conceptual tool for understanding participation in the ELC intervention. Illness representations were also found to influence exercise behaviour, thus, indicating that Leventhal *et al.*'s (1992) self-regulatory model is a useful framework for explaining exercise behaviour in individuals referred to the ELC programme. This thesis found that a number of variables had an influence on physical activity behaviour and highlighted the complexity of the relationship between them. Indeed, one perspective is that “physical activity is too complex a behaviour to be encompassed by a single theory” (Bauman *et al.*, 2002, p.10). Other researchers have also suggested that there is no one single theory that is able to thoroughly explain physical activity and exercise behaviour and that “there is still a need to develop a comprehensive theory of exercise behaviour change that informs the development of interventions” (Mutrie & Woods, 2003, p137).

This thesis highlighted that age and gender are demographic factors that have an important influence on physical activity behaviour. Both of these factors mediate the influence of other variables such as barriers and health problems/illness representations on physical activity behaviour. Increasing age has a negative influence on physical activity due to barriers that include fear of injury, poor health and low self-efficacy (particularly in those with chronic problems). However, older adults are more likely to adhere to a primary care exercise referral scheme since they believe they have problems, are concerned about them and adopt exercise as a problem-focused coping strategy in order to deal with this. In addition, their time is less likely to be constrained by work and family commitments. Their high PHLC beliefs also make them more receptive to the advice of GPs. The greater levels of physical activity found in men, when compared to women indicate that women face different barriers, particularly with respect to availability of time. They also have different health conditions and lower levels of self-efficacy than men. However, they are more likely to be referred into a primary care exercise referral scheme due

to the way in which they perceive their symptoms, which also means that they are more likely to consult their GP than men.

Having a high self-assessment of health had a positive influence on completion of the ELC programme. This measure is so effective as a predictor of physical activity because it incorporates criteria that are as broad and inclusive as individuals wish to make them and involves perceptions, values and preferences. However, perception of there being some problem with health, and a concern about this, had a positive influence on initiation of activity, particularly when this problem was viewed as something that was long-term in duration. This indicates that one reason people adhere to physical activity is if they perceive they are vulnerable to disease and it will have negative consequences. However, some health problems that included pain and musculoskeletal complaints were found to negatively influence physical activity behaviour and to contribute to drop out and a decrease in feelings of self-efficacy. Indeed, self-efficacy was an important influence on completion of the ELC programme. However, it was not a pre-requisite for initiation of activity or sufficient to support maintenance of activity after the ELC programme. Self-efficacy may have been developed during the programme via factors such as the achievement of valued outcomes. In fact, outcomes in terms of the advantages (pros) and disadvantages (cons) that were expected to result from participation in the ELC had an influence on initiation and maintenance of activity. If individuals expected positive outcomes in terms of health benefits, enjoyment or social interaction, they were more likely to initiate activity. Achievement of these valued outcomes had a positive influence on completion of the ELC programme. However, valuing health benefits that were distant in time (such as prevention of future health problems) had a positive influence on long-term maintenance of activity after the ELC. Perceptions of activity as not enjoyable had a negative influence on initiation of activity and failure to find it enjoyable had a negative influence on completion of the ELC and the subsequent maintenance of activity. Enjoyment was influenced by factors such as social interaction, the activity and the activity environment. Injury may be one of the consequences of physical activity, particularly for those who are sedentary and at high risk of injury. Perceptions that physical activity might result in injury or harm had a negative influence on initiation of activity and also on maintenance of activity after the end of the supervised programme (indicating that specialist supervision is

particularly important in allaying fear of injury in at risk groups). Another disadvantage of activity is that it reduces the time available for other things. If individuals perceived that time was constrained by work or family commitments, they were less likely to initiate or maintain activity.

Having an internal HLC orientation had a positive influence on initiation of physical activity (those who believed they could control their health via their own actions were most likely to join the ELC programme). Having these beliefs combined with powerful other HLC beliefs was particularly important in positively influencing completion of the ELC programme (indicating that individuals were both receptive to the health message and able to translate this advice into behaviour change). The thesis highlighted the importance of the GP in influencing initiation of activity on a primary care exercise referral scheme and, in particular, how good communication can positively influence initiation of activity. However, whilst GP counselling can get people started on a physical activity programme, it is important that individuals are offered individualised supervision to support them to achieve behaviour change. The findings indicated that dimensions of HLC are not fully able to mediate the influence of other variables, such as age and gender, on physical activity behaviour. In addition, HLC appears to be influenced by health status (with those having chronic illness being more likely to be externally orientated). Health status (and illness representations) may also influence the value that individuals place on their health (they may only value it when it is diminished or threatened). Health status may also influence perceived levels of capability to exercise (e.g. those in poor health may doubt their capability to exercise). Thus, the three factors that make up Wallston's modified social learning theory (HLC, health value and self-efficacy) may be mediated by health status, which is in turn mediated by age and gender. It is also important to note that health outcomes, and illness representations, have a time frame attached to them. Only when an individual's focus is on future outcomes (due to illness representations being long-term in duration) and he/she views physical activity as a means of helping him/her to achieve these outcomes, will physical activity behaviour be maintained beyond the end of the ELC programme.

The NQAF (2001) states the selection of patients for an exercise referral scheme is important. The findings from the studies in this thesis provide evidence to suggest

that it is generally more appropriate to refer patients with certain characteristics into a scheme (Table 10.1)

Table 10.1

Characteristics of inappropriate/appropriate referrals to an exercise referral scheme

Inappropriate	Appropriate
Low internal health locus of control Low powerful others health locus of control Not receptive to GP advice Expect GP to provide the solution	High internal health locus of control High powerful others health locus of control Believe own actions can influence their health Prepared to take action / attribute control of solutions to themselves Receptive to GP advice
Low self-efficacy	High self-efficacy
Believe activity has no value to them Unrealistic expectations about own capabilities / time to achieve benefits	Expect valued benefits from activity Realistic expectations about capabilities, timescales and outcomes
Have a short-term time perspective Want immediate positive outcomes Focus on negative immediate consequences of activity (e.g. pain) View time as constrained by other demands	Have a long-term time perspective Prepared to sacrifice short-term inconvenience for long-term benefits Focus on improving current situation, preventing future problems Ability to persevere, cope with relapses due to ebb and flow of illness/other commitments. View time as flexible and open ended
Do not perceive there is a risk / problem with their health Believe illness is short-term in duration Believe activity may cause them harm	Believe their health may be at risk Are concerned about their health Believe illness is long-term Able to overcome fear that activity will cause them harm
Working women	Retired individuals

It is possible that these characteristics could be categorised into the five stages of change, as described in the transtheoretical model. Individuals in the pre-contemplation stage who have no intention of changing (inappropriate referrals) may exhibit characteristics such as lack of belief in their ability to exercise, lack of belief that their own actions can influence their health, belief that they will obtain no benefits from activity, belief their health is not at risk and therefore, see no point in changing their current behaviour. In contrast, those in the maintenance stage of behaviour change are likely to have a high level of self-efficacy, believe that their

own actions are having a positive influence on their health, that there is some risk to their health and they are able to obtain long-term future benefits from exercise. In addition, individuals in the maintenance stage of behaviour change will believe that the benefits of regular activity outweigh any barriers or negative consequences.

This thesis has added to the debate about factors that could be included in a theory that examines exercise behaviour in individuals at risk of CHD who are referred to a primary care exercise referral scheme. Whilst the study looked at Wirral adults the findings can be used to inform other primary care exercise referral schemes. They highlight that 'one size fits all' programmes are not particularly effective in increasing levels of physical activity and that interventions need to be tailored to accommodate differences in age and gender as well as the psychological preferences and perspectives of participants. There is potential for these findings to be generalised to the wider, national, adult population. In particular, they provide information to the exercise psychology field regarding the processes involved in the adoption and maintenance of exercise behaviour.

Chapter 11

Recommendations

11.1 Introduction

The recommendations made in this chapter are informed by the literature review and based on the findings from the thesis. Chapters 5 and 7 highlighted the importance of the GP (powerful other) in the process of changing physical activity behaviour. Therefore, the first section focuses on the referral process in to the Exercise and Lifestyle Centres (ELC) intervention and how the referrer/GP can help to increase activity levels (Section 11.2). The aim of the ELC programme was to reduce the risk of coronary heart disease in Wirral adults via increasing levels of physical activity. However, Chapter 4 highlighted that attempting to change physical activity habits via an intervention such as the ELC produces limited outcomes. The qualitative findings, (Part 3) provided some explanations for this. Thus, the second section of this chapter sets out recommendations about how the ELC intervention could have been improved in order to increase adherence rates to physical activity, both over the duration of the programme, and to support maintenance of physical activity in the longer-term (11.3). The final section briefly covers issues relating to evaluation of the ELC programme (11.4).

11.2 The referral process.

Potential participants should be carefully screened at the point of referral. This would mean that only those people who felt capable and motivated to take part in the intervention were referred. It is important that the referrers communicate effectively with their patients in order to identify their expectations, preferences and beliefs about their health and physical activity. By adopting a patient centred approach to the consultation (incorporating communication, partnership and health promotion) compliance with advice to exercise will be improved. Communication should include the referrer providing information about the patient's illness, its duration (chronic/acute), how it will impact on his/her health over time and how the patient can be actively involved in managing it.

Referrers should be well informed about the ELC and be able to talk knowledgeably to their patients about it. They should ensure that patients have reached the 'action' stage of motivational readiness to change before referring them to the ELC. This

could include identifying and discussing their motivation for change and barriers to change. Referrers should provide clear simple educational information, motivate patients, identify the benefits of activity and discuss goals. Emphasis should be on helping patients to move through the stages of change of exercise adoption by increasing the pros of exercise and decreasing the cons. In order to achieve this, a strategy would need to be developed to enable more time to be spent on the referrer/patient consultation. The referrer should emphasise that referral to the ELC is the beginning of a lifestyle change, not merely a prescription to be taken for 12 weeks and then stopped.

There should be a greater focus on referrers engaging with those individuals who are most at risk from CHD. In particular, referrers should be encouraged to target individuals from Wallasey and Birkenhead where the levels of deprivation and the standard mortality rates are the highest. A strategy should also be developed to ensure that more men are referred into the intervention. A range of settings should be considered as suitable for referral points into the ELC and for promotion of physical activity, such as work-sites, places of worship, and other community settings frequented by adults at risk of CHD.

11.3 Improvements to the ELC.

The ELC staff should continuously work in partnership with the local PCT so that details of the intervention are communicated clearly to all potential referrers (GPs, specialist diabetic, stroke and cardiac services). It should promote the benefits of physical activity to potential referrers, dispel any misconceptions and clarify the risks associated with physical activity. The ELC could provide training to referrers to enable them to deliver brief, individualised physical activity advice.

Consideration should be given to encouraging other health professionals to play a role in promoting behaviour change.

The exercise advisers should have a broad range of expertise and abilities. Their credibility could be enhanced by accreditation to a recognised exercise adviser qualification. GPs may then have more confidence in referring their patients to the intervention if they were confident of the level of support they would be offered. Exercise advisers should be equipped with the tools (knowledge, skills and abilities) to be able to identify participants' motivation, monitor their progress, provide

feedback and use problem solving strategies. They should be provided with continuing professional development.

Potential participants could be offered the opportunity to attend a group session (after the referral and before an individual appointment with an exercise adviser). A group session would enable them to find out information, ask questions and meet with other participants to initiate social interaction. This session could include a visit to the exercise venue and an activity taster session. This may reduce feelings of isolation and uncertainty and improve the numbers who initiate activity as well as being more efficient use of programme resources.

Participants should be made aware of all of the activities available on the intervention. Appropriate activity should be selected on the basis of their preferences, perceived capabilities, motivation and health condition. The design of the programme needs to appreciate that the range of health, physical ability, cognitive barriers and motivation to exercise in participants will be enormous. Tailoring the programme to some aspect of the target group (for example motivational state) will be much more effective than having a 'one size fits all' programme. Each activity programme should be unique to the individual. The challenge of the activity needs to be matched carefully to each participant's capability (to avoid boredom or a decrease in self-efficacy beliefs).

The exercise advisers need to understand participant's motivation for changing their activity behaviour and their motivational readiness to change. This will help them to establish realistic goals consistent with participant's needs. Participants should be helped to establish a series of short-term goals that are achievable, as well as being helped to work towards a long-term goal. The ELC could adopt motivational interviewing to improve participant's motivation to initiate and maintain behaviour change. Motivational interviewing is a process that aims to encourage individuals to explore previously unconsidered reasons for changing their behaviour. It focuses on two key questions, 'what are some of the good things about your current behaviour?' and 'what are the less good things about it?' Individuals are also asked to express any concerns they have about their present behaviour or about changing. The adviser would facilitate the motivational interview by summarising discussions and feeding back to the individual. This process may result in a state of cognitive

dissonance in which the individual holds and actively considers two or more sets of opposing beliefs about increasing physical activity. The individual would then seek to reduce this dissonance (or discomfort) by with rejecting the newly considered arguments or adopting a new belief or behaviour.

The NQAF (DoH, 2001) suggests that if individuals delivering exercise are trained in behaviour change strategies (e.g. counselling and motivational interviewing) the effectiveness of exercise referral schemes is likely to be greater. Whilst the ELC advisers were trained exercise physiologists they lacked training in counselling and motivational interviewing, which would have had a negative influence on the outcomes from the evaluation. Whilst the ELC sought to use the NQAF as a framework, in practice it proved difficult to interpret how certain guidelines could best be put in to operation (e.g. what tools should be used to measure activity and to evaluate outcomes). The way in which the ELC was operated has implications for the revision of the NQAF in terms of extending the guidance that it covers. For example, covering the practical issues of engaging referrers in order to ensure patients are effectively selected and screened, designs for evaluation (including appropriate measures) and guidance on how follow-up data should be analysed.

Choice of activity should be driven by aspects personal to each participant and not be primarily influenced by design aspects of the intervention (e.g. venues, facilities and activities available at the leisure centres or the times of supervised sessions). Neither should the adviser's preferences dictate what activity participants take part in. Some group physical activities, involving a competitive element, need to be added to the portfolio of options available. All participants should be offered supervised sessions. This would involve negotiating evening and weekend sessions with the exercise venues to enable those who work to obtain support.

The design of the ELC needs to be based on an understanding of the sedentary activities that compete for people's time and attention. A better understanding of these may enable strategies to be developed that displace them, and replace them with physical activity. Barriers to becoming more active should be identified and realistic strategies devised to enable participants to cope with these. Advice could be provided on planning physical activity into existing lifestyles and on introducing cues to exercise into participant's homes and workplaces.

It is important for people designing interventions to understand the constraints on behaviour in a broader social context before they can develop strategies for changing it (e.g. gender and age issues). In particular, there is a need to acknowledge that gender differences exist for key psychological variables associated with physical activity behaviour (e.g. women have lower self-efficacy than men). There is a need, therefore, to tailor the intervention to gender differences. In addition, other demands on time, such as work, need to be considered. The design of the intervention also needs to take into consideration age related variables. For example, older adults might prefer flexible support that was available outside of structured exercise sessions. Consideration should be given to including goal setting, self-monitoring, feedback and relapse management elements in to the programme. Participants could be given instruction in behavioural and cognitive strategies to promote physical activity. This may help them continue with physical activity once formal contact and instruction is discontinued.

The design should incorporate a strategy to enable participants to move through the stages of behaviour change (in particular, increasing the pros and decreasing the cons in each stage). In the preparation stage goals should be identified, plans discussed and prepared and participants followed up. Once the participant moves into the action stage, follow up should be carried out, goals should be reviewed and coping strategies discussed. The maintenance stage could review coping strategies, reassess goals and advise on prevention of injury and management of relapse. In reality these stages of change do not follow on continuously. In addition, the participant may enter the ELC before they have really given any consideration to changing and then different, predominantly motivational, strategies will be needed (as detailed in Section 11.1).

The physical activity environment should ensure that there is opportunity for social interaction. It should be selected to help to enhance perceptions of capability and enjoyment. During the course of the intervention, access to the activity venue should be ensured or appropriate options provided. Care should be taken to ensure that the activity environment is not used to foster dependence in participants (i.e. the same support at the same venue and times). A range of future activity options should be discussed with participants that would enable them to maintain activity in the long

term. These options should be within participant's financial budgets and fit in with their preferences and lifestyles.

The design of the ELC should incorporate a time perspective. Lasting behaviour change may necessitate building connections between present behaviour and future outcomes. Thus, the intervention should identify and highlight the various beneficial future outcomes of regular physical activity and also the negative effects of being sedentary. Participants should be helped to build the mental connections that link their current behaviour to future outcomes (i.e. long-term benefits should be couched within a framework that emphasises connections to present behaviour). They should be assisted to decrease the cons associated with physical activity and increase the pros. In particular, how participants might overcome the barriers to participating in physical activity (including overcoming fear of injury, managing discomfort and fitting physical activity into their lives).

Participants should be given support to manage their time. They need to be primarily focused on the longer-term rewards from physical activity. Education should focus on enabling them to appreciate that there will, inevitably, be short term costs involved in changing to a more active lifestyle (inconvenience, discomfort) but that in time, these will be outweighed by positive outcomes. They should be informed of the expected benefits and the time required for them to be obtained. A variety of strategies should be used to communicate with participants (e.g. written materials and verbal support) and be tailored to their motivational readiness to change.

Whilst participants may not necessarily have had control over the cause of their health problem, they should be encouraged to believe that they have control over its solution. They should be educated about how to exercise safely, how to avoid injury and manage discomfort. They need to develop an understanding of how to take care of their own exercise after the end of the supervised sessions and acknowledge that the ELC is to help them initiate change (i.e. it is just the beginning of a process).

11.4 Evaluation issues

Resources should be allocated specifically for evaluation and input from experts should be sought. The objectives of the evaluation should be clear at the outset and

outcome measures need to be carefully defined. A range of physical activity measures should be included and be sufficiently sensitive to pick up increases in lower intensity activity. Outcome measures need to be used consistently by all of those involved in the intervention, particularly the exercise advisers. Measures need to be devised that enable data to be gathered easily within the normal operation of the intervention. Careful consideration needs to be given to balancing exercise advisers' time in supporting the participant with their physical activity and also in taking responsibility for assessing and monitoring their outcomes. Advisers should be trained to carry out evaluation and to appreciate how to use it as a motivational tool with participants. Outcome measures also need to include an assessment of outcomes in the longer-term beyond the end of the intervention. All of those delivering the intervention should also have an appreciation of the distorting effects of targets and the difficulty of accurately measuring physical activity. The system for auditing the intervention should include measures such as participant satisfaction, physical and psychological outcomes and changes in lifestyle. This should include gathering feedback from participants on the effectiveness of the exercise advisers and other aspects of the intervention (e.g. the activities and activity environment). This will enable continuous improvement to be made to the delivery process. Systems need to be set up that enable data to be collated analysed and reported on (including identifying determinants of adherence to the programme).

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Appendices

Appendix 1	Survey questionnaire
Appendix 2	Survey covering letter
Appendix 3	Variables involved in the survey chi squared analysis
Appendix 4	Exercise and Lifestyle Centres (ELC) initial assessment questionnaire, part one.
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Appendix 1

**Wirral
Health and Lifestyle Questionnaire**

Place a cross like this in the box which best matches your response.

<p>1. How is your health in general? Would you say it is: Excellent <input type="checkbox"/> Very good <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Bad <input type="checkbox"/> Very bad <input type="checkbox"/></p>	
<p>2. Do you have any long-term illness, health problems of disability which limits your daily activities or the work you can do? Yes <input type="checkbox"/> No <input type="checkbox"/></p>	
<p>3. In the last 12 months have you suffered from any of the following problems?</p> <p>Angina <input type="checkbox"/></p> <p>Heart Attack <input type="checkbox"/> (incl. Myocardial infarction or coronary thrombosis)</p> <p>Heart Failure <input type="checkbox"/></p> <p>Other Heart Trouble <input type="checkbox"/></p> <p>Arthritis <input type="checkbox"/></p> <p>Asthma <input type="checkbox"/></p> <p>Bronchitis <input type="checkbox"/></p> <p>Diabetes <input type="checkbox"/></p> <p>Osteoporosis (thinning of the bones) <input type="checkbox"/></p> <p>Nervous trouble or persistent depression <input type="checkbox"/></p> <p>Sciatica, lumbago or recurring back ache <input type="checkbox"/></p> <p>Stroke <input type="checkbox"/></p> <p>Other chronic illness <input type="checkbox"/></p> <p>I have not suffered any illness <input type="checkbox"/></p>	<p>4. Has a doctor ever told you that you have had a heart attack? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>5. Has a doctor ever told you that you have had a stroke? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>6. Have you ever had your blood pressure measured by a doctor or nurse? Yes, within the past 12 months <input type="checkbox"/> Yes, between 1 and 5 years ago <input type="checkbox"/> Yes, longer than 5 years ago. <input type="checkbox"/> No, never <input type="checkbox"/> Don't know <input type="checkbox"/> If you answered No, Never, go to Question 10</p>
<p>7. Was you <u>MOST RECENT</u> blood pressure measurement high? Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> Was not told <input type="checkbox"/></p>	
<p>8. What was the most recent measurement? <input style="width: 80px; height: 20px;" type="text"/> Don't know <input type="checkbox"/></p>	
<p>9. Have you ever had a blood pressure measurement that was high? Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> Was not told <input type="checkbox"/></p>	

10. Have you ever had your blood cholesterol level measured by a doctor of nurse?		11. The last time your blood cholesterol was measured, were you told it was:	
Yes, within the last 12 months	<input type="checkbox"/>	Normal (alright/fine)	<input type="checkbox"/>
Yes, between 1 and 5 years ago	<input type="checkbox"/>	Higher than normal	<input type="checkbox"/>
Yes, longer than 5 years ago	<input type="checkbox"/>	Lower than normal	<input type="checkbox"/>
No, never (go to question 13)	<input type="checkbox"/>	Or	<input type="checkbox"/>
Don't know	<input type="checkbox"/>	Were you not told anything	<input type="checkbox"/>
12. What was the measurement? <input type="text"/>		Don't know <input type="checkbox"/>	
13. How Tall are you? <input type="text"/>		14. What is your usual weight <input type="text"/>	

These questions are about how you have been feeling lately:

<p>Please read this carefully: We should like to know if you have had any medical complaints, and how your health has been in general, over the past few weeks. Please answer ALL the questions by crossing the box which you think most applies to you. Remember that we want to know about present and recent complaints, not those you had in the past. It is important that you try to answer All the questions.</p>	
15. Have you recently	
1. Been able to concentrate on whatever you are doing?	
Better than usual <input type="checkbox"/> Same as usual <input type="checkbox"/> Less than usual <input type="checkbox"/> Much less than usual <input type="checkbox"/>	
2. Lost much sleep over worry?	
Not at all <input type="checkbox"/> No more than usual <input type="checkbox"/> Rather more than usual <input type="checkbox"/> Much more than usual <input type="checkbox"/>	
3. Felt you were playing a useful part in things?	
More so than usual <input type="checkbox"/> Same as usual <input type="checkbox"/> Less useful than usual <input type="checkbox"/> Much less useful <input type="checkbox"/>	
4. Felt capable of making decisions about things?	
More so than usual <input type="checkbox"/> Same as usual <input type="checkbox"/> Less useful than usual <input type="checkbox"/> Much less capable <input type="checkbox"/>	
5. Felt constantly under strain?	
Not at all <input type="checkbox"/> No more than usual <input type="checkbox"/> Rather more than usual <input type="checkbox"/> Much more than usual <input type="checkbox"/>	
6. Felt you couldn't overcome your difficulties?	
Not at all <input type="checkbox"/> No more than usual <input type="checkbox"/> Rather more than usual <input type="checkbox"/> Much more than usual <input type="checkbox"/>	
7. Been able to enjoy your normal day to day activities?	
More so than usual <input type="checkbox"/> Same as usual <input type="checkbox"/> Less so than usual <input type="checkbox"/> Much less than usual <input type="checkbox"/>	
8. Been able to face up to your problems?	
More so than usual <input type="checkbox"/> Same as usual <input type="checkbox"/> Less able than usual <input type="checkbox"/> Much less able <input type="checkbox"/>	

9. Been feeling unhappy and depressed?
Not at all <input type="checkbox"/> No more than usual <input type="checkbox"/> Rather more than usual <input type="checkbox"/> Much more than usual <input type="checkbox"/>
10. Been losing confidence in yourself?
Not at all <input type="checkbox"/> No more than usual <input type="checkbox"/> Rather more than usual <input type="checkbox"/> Much more than usual <input type="checkbox"/>
11. Been thinking of yourself as a worthless person?
Not at all <input type="checkbox"/> No more than usual <input type="checkbox"/> Rather more than usual <input type="checkbox"/> Much more than usual <input type="checkbox"/>
12. Been feeling reasonably happy, all things considered?
More so than usual <input type="checkbox"/> Same as usual <input type="checkbox"/> Less so than usual <input type="checkbox"/> Much less than usual <input type="checkbox"/>
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For the following questions, please select ONE option only

Diet and Nutrition

16. What kind of bread do you eat MOST OFTEN?	17. What spread do you USUALLY have with bread?
Don't eat bread <input type="checkbox"/>	Don't use a spread <input type="checkbox"/>
Brown or wholemeal <input type="checkbox"/>	Butter <input type="checkbox"/>
Asian breads (Chapati, Nan etc) <input type="checkbox"/>	Hard margarine in a block <input type="checkbox"/>
White <input type="checkbox"/>	Soft margarine in a tub <input type="checkbox"/>
Other bread (please specify) <input type="checkbox"/>	Low fat spread <input type="checkbox"/>
.....	Other spread (please specify) <input type="checkbox"/>
18. What kind of fat or oil is used MOST OFTEN when you eat fried foods?	
Don't eat fried foods <input type="checkbox"/> Butter <input type="checkbox"/> Lard/dripping <input type="checkbox"/> Olive oil <input type="checkbox"/> Gee <input type="checkbox"/>	
Corn/sunflower/rapeseed/soya oil <input type="checkbox"/> Other vegetable oils or fat <input type="checkbox"/>	
Other (please specify)	
19. What milk do you USUALLY use?	
Don't use milk <input type="checkbox"/> Full cream milk <input type="checkbox"/> Semi-skimmed milk <input type="checkbox"/> Skimmed <input type="checkbox"/>	
Dried <input type="checkbox"/> Other (please specify).....	
20. On a typical day, how many portions of fruit and vegetables do you eat (a typical portion is a piece of fruit/glass of fruit juice/serving of a particular vegetable. Potatoes should not be included as vegetables).	
None <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 or more <input type="checkbox"/>	

21. About how often do you eat the following foods?						
	Never	Less than once a week	1-2 times a week	3-6 times a week	Once a day	More than once a day
Bread/bread rolls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Potatoes (not chips), rice or pasta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cakes, pies, puddings, pastries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fruit or fruit juice (not squash)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vegetables/salad (except potatoes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fried foods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fish (not fried)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beef, pork or lamb	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chicken or turkey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beefburgers/sausages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cheese (not cottage)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biscuits, chocolates, crisps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. At present are you taking any extra vitamins, minerals or food supplements, as tablets, capsules, pills, powders, syrups or drops? (exclude meal replacement drinks e.g. 'complan', 'build up' etc.)

Yes No

Exercise

23. How often do you take MODERATE exercise – e.g. going for a walk, walking the dog, bowling etc?

Never Less than once a month More than once a month, but less than once a week
 one to three times a week Four to six times a week Every day of the week

24. How often do you take VIGOROUS exercise – i.e. things which last more than 20 minutes and make you breathless e.g. jogging, football, aerobics, digging the garden etc?

Never Less than once a month More than once a month, but less than once a week
 one to three times a week Four to six times a week Every day of the week

Alcohol

25. On average, how often do you drink any alcoholic drinks? (e.g. beer, lager, cider, wine, sherry, vermouth or spirits – mark ONE option only.)

Never Less than one day a month A couple of times a month
 One to three times a week Four to six times a week Every day of the week

26. In an average week, how many of the following do you drink? (please put '0' if you do not drink the type mentioned).

Pints of beer, larger, cider Pints. Glasses of sherry/wine Glasses

Tots of spirits/liqueurs Tots

Smoking

27. Do you smoke, or have you ever been a smoker? Yes No If no, go to question 33

28. Do you currently smoke at least once a day? Yes No If no, go to question 32

<p>29. On average, how many cigarettes do you smoke a day?</p> <p><input type="text"/> Per day</p>	<p>30. On average, how many cigars do you smoke a day?</p> <p><input type="text"/> Per day</p>
<p>31. On average, how much tobacco (pipe or roll ups) do you smoke in a week?</p> <p><input type="text"/> Grams or <input type="text"/> Ounces</p>	<p>32. How long ago did you stop smoking?</p> <p><input type="text"/> Months or <input type="text"/> Years</p>

33. In most weeks, how many hours a week are you exposed to other people's tobacco smoke (e.g. at home, at work, in the pub etc)? Hours

About you

<p>34. What sex are you?</p> <p>Male <input type="checkbox"/> Female <input type="checkbox"/></p>	<p>35. What is your age? <input type="text"/></p>
--	--

36. What is your current employment status (mark one box which closely describes you)

Working full time (30 hours or more a week)	<input type="checkbox"/>
Working part time (less than 30 hours a week)	<input type="checkbox"/>
Unemployed and looking for a job	<input type="checkbox"/>
I have never had a paid job	<input type="checkbox"/>
Unable to work due to illness or disability	<input type="checkbox"/>
Retired	<input type="checkbox"/>
Student	<input type="checkbox"/>
Housework, not looking for paid employment	<input type="checkbox"/>

37. What is your present or most recent occupation? (please write name of job and brief job description)

38. If you are NOT in paid employment, how long is it since you were?

Less than 3 months 3-12 months 1-2 years 2-4 years
 4 years or more Never been in paid employment

39. Would you describe yourself as:

White
 Black Carribean
 Black African
 Black Other
 Indian
 Pakistani
 Bangladeshi
 Chinese

40. Which of the following qualifications do you have? (mark all that apply or if not specified, the nearest equivalent)

1 + O levels/CSE's/GCSE's (any grades)
 5 + O levels, 5 + CSE's (grade 1)
 5 + GCSE's (Grades A-C), School Certificate
 1 + A levels/AS levels
 2 + A levels, 4 + AS levels
 Higher School Certificate
 First Degree (e.g. BA, BSc)
 Higher Degree (e.g. MA, PhD, PGCE)
 Post-graduate certificates/diplomas
 NVQ Level 1, Foundation GNVQ
 NVQ Level 2
 Intermediate GNVQ
 NVQ Level 3, Advanced GNVQ
 NVQ Levels 4-5, HNC, HND
 Other Qualifications (e.g. City & Guilds, RSA/OCR)
 BTEC/EDExcel
 No Qualifications

41. Do you care regularly for someone with a long standing illness or disability – other than as part of your job?

Yes No If no, go to last page of questionnaire

42. How many people with a long standing illness or disability do you care for?

Living with you in your own home

Living with someone else

43. Please think of the person to whom you give the most care. What problem(s) does he/she have? (please mark all that apply).

Long term illness Physical disability Loss of sight Loss of hearing
 Learning disability (mental handicap) Mental health problems
 Problems of old age Senile dementia (Alzheimers) Other (please specify)

Part of the aim of this questionnaire is to help the health service to reduce the number of people who suffer from coronary heart disease. To understand what is causing this disease in Wirral, we need to know more about what are called "risk factor".

To do this, we need to ask a number of volunteers to allow a trained nurse to measure their risk factors.

If you would like more information, please provide your name, address and day time telephone number below. All of the information which we collect from you will be treated in the strictest confidence.

We will send you full details and ask for your consent at a later date. If you complete your details, you are expressing a willingness to take part. When you receive more information, you are under no obligation to take part if you do not wish to do so.

Name

Address

Telephone
Number

This sheet will be detached and separated from the questionnaire to ensure that your answers are anonymous.

Thank you for your co-operation

Appendix 2.

Survey covering letter

**49, Hamilton Square, Birkenhead
Wirral, CH41 5AR**

June 2001

Dear Resident,

Health & Lifestyle Survey in Wirral

I am writing on behalf of the NHS organisations in Wirral, to ask you for your help with a survey. It aims to find out about the current health and lifestyles of Wirral residents. The results will help to identify where more work needs to be done, so that everyone in Wirral may enjoy healthy lifestyles. They will be used to influence investment in future health projects and to enable appropriate health services to be developed.

To obtain this information, we are asking 4,000 people to fill in a questionnaire. Your name is one of those selected at random from the lists of people who are registered with local Doctors.

Everyone's opinion is important, and that includes you! Even if you are well and have little contact with the health service, your answers are still very important.

We would be grateful if you would spare the time to fill in the questionnaire and return it in the FREEPOST envelope provided. It should only take about 10 to 15 minutes.

What you tell us will be strictly confidential and you will not be identified in any report.

If you do not want to take part, please send back the blank questionnaire in the envelope provided and we will not contact you again. Your future health care will not be affected.

The results from the survey will be published in the local press before the end of the year.

If you would like more information, please telephone Helen Beers or Jackie Cooper on **647 2966**.

Thank you for your help.

Yours sincerely,

Helen Beers
Co-ordinator, Health and Lifestyle survey.

Appendix 3

Results of the chi square analysis.

Table 1. Age group

	χ^2	df	<i>p</i> =
Survey responses	46.78	2	.001
Employment (work / not)	402.30	2	.001
Meeting recommended levels of activity	13.61	2	.001
Self-assessed rating of health in general	165.30	10	.001
Long-term illness, health problem or disability	177.23	2	.001
Arthritis	287.79	2	.001
Heart attack	73.53	2	.001
Stroke	45.07	2	.001
Body Mass Index (BMI)	71.11	4	.001

Table 2. Significant differences in employment

<u>Employment status</u>	χ^2	df	<i>p</i> =
Gender	179.07	6	.001
Long-term illness, health problem or disability	454.00	6	.001
BMI	76.65	12	.001
Meeting recommended levels of activity	46.01	6	.001
<u>Work / not work</u>			
Age group	402.30	2	.001
Self-assessed rating of health in general	174.11	5	.001
Arthritis	124.55	1	.001
Heart attack	42.55	1	.001
Stroke	23.30	1	.001

Table 3. Meeting recommended levels of activity

	χ^2	df	<i>P</i> =
Employment	46.01	6	.001
Age group	13.61	2	.001
Self-assessed rating of health in general	62.63	5	.001
Long-term illness, health problem or disability	26.69	1	.001
Arthritis	17.76	1	.001
BMI	20.59	2	.001
Gender	8.67	1	.003

Table 4. Gender

	Chi Squared	df	P	Significant at
Meeting recommended levels of physical activity	8.67	1	.003	p<= .005
Survey responses	34.18	1	.000	p<= .001
Employment	179.07	6	.000	p<= .001
Arthritis	29.96	1	.000	p<= .001
Heart attack	8.01	1	.005	p<= .001
BMI	30.15	2	.000	p<= .001

Table 5. Illness, health problems or disability

	Chi Squared	df	p	Significant at
Employment	454.00	6	.000	p<= .001
Age	177.23	2	.000	p<= .001
Meeting recommended levels of activity	26.69	1	.000	p<= .001
Self-assessed rating of health in general	693.38	1	.000	p<= .001
BMI	14.13	2	.001	p<= .001

Table 6. Frequencies for Table 3.1

Variable		Meeting recommendations for physical activity	
		Yes	No
Age	Under 35	263	156
	35-64	401	359
	65+	208	195
Employment	Full time	298	270
	Part time	108	83
	Unemployed	39	23
	Illness/health problem/disability	42	65
	Retired	230	213
	Student	67	20
	Housework	77	29
Self-assessed Rating of health	Excellent	110	43
	Very good	295	198
	Good	283	208
	Fair	140	175
	Bad	26	63
	Very bad	6	8
Long-term illness Health problem/disability	Yes	195	645
	No	242	445
Arthritis	Yes	146	180
	No	659	478
BMI	Normal	485	321
	Overweight	267	241
	Obese	84	110
Gender	Male	417	287
	Female	455	423

Appendix 4

Exercise and Lifestyle Centres
Initial assessment questionnaire. Part 1.

Assessment date Advisors Name

Activity start date Activity end date

3 Week follow up 7 Week follow up

Referrer Referring Practice

Reason(s) for referral

<u>Personal Details</u>			
Name	.....	
Address	.....	
		
Postcode	.....	Date of Birth	.....
Phone numbers	.....	Ethnicity	Gender
	.....	White <input type="checkbox"/>	Male <input type="checkbox"/>
		Other <input type="checkbox"/>	Female <input type="checkbox"/>
<i>Are you currently:-</i>			
Married / living as a couple	Single	Separated or divorced	Widowed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<u>Employment status</u>			
Unemployed			
Under 6 months <input type="checkbox"/>	1 year <input type="checkbox"/>	2 years <input type="checkbox"/>	Over 3 years <input type="checkbox"/>
Employed full time <input type="checkbox"/>	Occupation	.....
Employed part time <input type="checkbox"/>	Occupation	.....
Fulltime Homemaker/ Carer for family <input type="checkbox"/>		Student <input type="checkbox"/>	
Retired <input type="checkbox"/>	Past Occupation	.....
Long term sick <input type="checkbox"/>	Occupation	.....

Medical History

Have you suffered from any kind of heart disease or angina? YES NO

Have you ever suffered from a stroke or any kind of circulation disorder? YES NO

Do you ever suffer from chest pains? YES NO

Do your legs ache when you walk up stairs? YES NO

Do you have asthma or breathing difficulties? YES NO

Do you suffer from arthritis? YES NO

Do you suffer from stress, anxiety or depression? YES NO

Do you now, or have you previously suffered from diabetes? YES NO

Do you now or have you previously suffered from epilepsy? YES NO

Do you suffer from back pain or aching joints? YES NO

Do you suffer from a recent or recurring injury? YES NO

Have you had any operation(s) or surgery in the last 12 months? YES NO

Are you pregnant? YES NO

Have you had a baby in the last 2 months? YES NO

Has any member of your family died before the age of 60 from coronary heart disease? YES NO

Are you currently suffering or recovering from a cold/virus/illness? YES NO

Is there any reason why you can't start the programme within the next 6 weeks? (e.g. for a holiday or hospital stay) YES NO

Are you on any medication that is not mentioned on the referral form? YES NO

Physiological Information (where appropriate)

Height (m)	
Weight (kg)	
BMI (kg/m ²)	

Blood pressure (mmHg)	
Total cholesterol (mmol/l)	

Alcohol. How many **units** of alcohol do you drink in an average week?

1 unit = ½ pint of beer or 1 shot of spirits or 1 glass of wine

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 0 | 1 - 7 | 8 - 14 | 15 - 21 | 22 - 28 | >28 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Smoking. How many cigarettes do you smoke in a day?

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 0 | 1 - 10 | 11 - 20 | 21 - 30 | 31 - 40 | >40 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Physical Activity.

In total, how much time during an average day would you say that you are physically active, to an extent that you feel **warm and breathe slightly harder** than usual? (e.g. heavy housework, brisk walking, gardening).

- | | | | | | |
|--------------------------|------------------------------|--------------------------|-----------------------------|--------------------------|--------------------------|
| None | Less than 15 minutes per day | about ½ an hour a day | Between 1 & 4 hours per day | 4 to 6 hours per day | Over 6 hours per day |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

At present, how often do you take exercise that makes you slightly **breathless** and sweaty and lasts for **over 20 minutes**? e.g. a brisk walk, digging the garden, jogging, cycling, aerobics, football...

- | | | | | | |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|
| Every day of the week | 4 to 6 times a week | 1 to 3 times a week | More than once a month, but less than once a week | Less than once a month | Never |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

What exercise do you do?.....

Are there any reasons why it may be difficult for you to change?

Is there anything or anyone that might get in the way & either prevent or affect your ability to change? (i.e. barriers to change). Examples:-

- | | | | |
|--------------------------------------|--------------------------|---|--------------------------|
| Lack of willpower | <input type="checkbox"/> | No transport | <input type="checkbox"/> |
| Too Lazy | <input type="checkbox"/> | I can't afford to eat healthily | <input type="checkbox"/> |
| Too busy | <input type="checkbox"/> | I can't afford to use sports facilities | <input type="checkbox"/> |
| I don't enjoy exercise | <input type="checkbox"/> | There is no one to look after my children | <input type="checkbox"/> |
| I'm too embarrassed to take exercise | <input type="checkbox"/> | I have no one to support me | <input type="checkbox"/> |
| Other reasons (please specify) | | Pain prevents me from changing | <input type="checkbox"/> |

.....

Appendix 5

12 Week Health Assessment

Name of Client Date of this Assessment

Advisors Name Date started activities

PART 1

For completion by the Advisor

Physiological Results

Date reading was taken / / / /
Tests	Result at start of programme	Result at end of programme
Blood Pressure		
Total Cholesterol		
HDL		
Weight	KG	KG
Height	CM	CM
BMI		

How often, on average each week have you attended your prescribed activities?

Name of activity	Number of times attended	Are you still attending?
		Yes <input type="checkbox"/> No <input type="checkbox"/>
		Yes <input type="checkbox"/> No <input type="checkbox"/>
		Yes <input type="checkbox"/> No <input type="checkbox"/>

If you are not attending, please tell us why.....

How have you progressed with your 'personal goal(s)' (i.e. activity at home)

Name of Home based activity(s)	How often have you been doing it?	Are you still doing it?
		Yes <input type="checkbox"/> No <input type="checkbox"/>
		Yes <input type="checkbox"/> No <input type="checkbox"/>

If you are not doing any activity, please tell us why.....

Physical Activity.

At present, are you doing any physical activity (exercise) that makes you *slightly breathless and sweaty*?

e.g. a brisk walk, digging the garden, jogging, cycling, aerobics, football, fitness suite workout.

Yes No

How often and for how long do you do this physical activity / exercise that makes you slightly breathless and sweaty?

How often? (e.g. every day / 3 times a week)

For how long? (e.g. 10 / 20 / 30 mins)

Since starting on the programme, have you increased the level of physical activity that you do in an average week?

Yes No

PART 2 For completion by the participant

Please complete the following questions by ticking the box that most closely matches how you feel about your health.

1. In general, would you say your health is
- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Excellent | Very good | Good | Fair | Poor |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2. Compared with when you started your Exercise and Lifestyle programme (12 weeks ago), how would you rate your general health now?

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Much better | Somewhat better | About the same | Somewhat worse | Much worse |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. What benefits / improvements in your health have you gained from attending the Exercise and Lifestyle Centre activities? (Please tick all of the boxes which relate to your improvement(s)).

<p>How has your health improved?</p> <p>More energy <input type="checkbox"/></p> <p>Less breathless <input type="checkbox"/></p> <p>Increased mobility <input type="checkbox"/></p> <p>Reduced pain <input type="checkbox"/></p> <p>Increased Flexibility / More supple <input type="checkbox"/></p> <p>Stopped smoking <input type="checkbox"/></p> <p>Increased fitness (able to do more in the gym) <input type="checkbox"/></p> <p>Lost weight <input type="checkbox"/></p> <p>Other <input type="checkbox"/></p> <p>I have not gained any benefit <input type="checkbox"/></p>	<p><input checked="" type="checkbox"/></p> <p>How much? .....KG /Stones .....lbs</p> <p>What is this?</p> <p>Why do you think this is?</p> <p>.....</p>	<p>How has your health improved?</p> <p>Reduced stress <input type="checkbox"/></p> <p>More relaxed <input type="checkbox"/></p> <p>Feel happier <input type="checkbox"/></p> <p>Increased confidence <input type="checkbox"/></p> <p>Feeling better <input type="checkbox"/></p> <p>Improved diet <input type="checkbox"/></p>	<p><input checked="" type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
--	---	--	--

Please write down which 3 of the improvements are the biggest / most important to you.

- {1}
- {2}
- {3}

Is there anything that WE could have done differently to support you in maintaining the activity and improving your health?

Yes No

If Yes, what could we have done differently?.....

Appendix 6

Exercise and Lifestyle Centres Questionnaire For participants who completed the scheme one year ago.

1. Physical Activity.

Please tell us about any physical activity you would do in a **NORMAL WEEK**
(please list all the different types of activity you do, or write none if you don't do any. Please do not just say exercise since we would like to know what kind it is).

Name of activity (e.g. walking; swimming; gym)	How often do you do it? (e.g. once a week, 4 times a week)	For how long do you do it (e.g. 30 minutes, 10 mins)
1.....
2.....
3.....

If you are not doing any activity, please tell us why.....

2. How are you feeling in yourself?

Since you participated in the programme....

	Yes it is better	No it is worse	There hasn't been a change
.....would you say that the image you have about yourself has changed? (i.e. your body image)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.....would you say that your general mood has changed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.....would you say that your social life has changed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Medical History

What medical problems did you have when you started on the programme?

Yes	Medical Problem	Did this improve when you were on the programme? (tick if it did get any better)	Have you kept up the improvement? (tick if it is still better now)
<input type="checkbox"/>	Blood Pressure	(yes it improved) <input type="checkbox"/>	(It is still better) <input type="checkbox"/>
<input type="checkbox"/>	Cholesterol	(yes it improved) <input type="checkbox"/>	(It is still better) <input type="checkbox"/>
<input type="checkbox"/>	Overweight	(yes it improved) <input type="checkbox"/>	(It is still better) <input type="checkbox"/>
<input type="checkbox"/>	Stress / Anxiety or Depression	(yes it improved) <input type="checkbox"/>	(It is still better) <input type="checkbox"/>
<input type="checkbox"/>	Mobility & joint problems	(yes it improved) <input type="checkbox"/>	(It is still better) <input type="checkbox"/>
<input type="checkbox"/>	Other. Please say what this was.....	(yes it improved) <input type="checkbox"/>	(It is still better) <input type="checkbox"/>

We would welcome your comments on the scheme. You may also like to let us know the reasons why you have or have not maintained your lifestyle change.

Appendix 7

Exercise and Lifestyle Centres Initial assessment questionnaire. Part 2.

*Please complete **ALL** of the following questions by ticking the box which most closely matches how you feel about your health.*

Section A

Please tick the box that most closely matches how you feel

	Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree
1. If you don't value your health, you don't have anything.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. There are many things I care about more than my health.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Good health is only of minor importance in a happy life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. There is nothing more important than good health.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section B

Please tick the box that most closely matches how you feel

	Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree
1. The main thing that affects my health is what I do myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. If I take care of myself, I can avoid illness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If I take the right actions, I can stay healthy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Having regular contact with my GP is the best way for me to avoid illness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Health professionals (e.g. GP) control my health.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Whenever I don't feel well, I should consult a medically trained professional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. No matter what I do, if I am going to get sick, I will get sick.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. My good health is largely a matter of good fortune.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. If it's meant to be, I will stay healthy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thank you for completing this form

Appendix 8

*Exercise and Lifestyle Centres
3rd Floor, Argyle Buildings
69 - 71 Argyle Street, Birkenhead Wirral CH41 6AB*

8th April 2002

Dear Exercise and Lifestyle Centres participant,

How are you getting on since finishing your program with us?

During the last year, as a result of the advice given to you by a medical professional, you attended the Exercise and Lifestyle centres program.

Over a period of 12 weeks, you participated in a number of activities, under the guidance of one of our advisers. These were designed to help you change your lifestyle and improve your health and wellbeing.

As part of our commitment to continuous improvement of the program and to gather information on the progress of people who have participated in it, we would like to know how you are doing now.

We would appreciate some information on your present lifestyle, health and wellbeing, and enclose a short questionnaire about this.

Please be absolutely honest with your answers.

If you have not been exercising, then please tell us why you think this is. If participating in the program was a life changing experience for you, please let us know. Your feedback will help us to evaluate the effectiveness of the activities we deliver and the support which we provide to individuals who attend the program.

Please spare the time to complete the enclosed questionnaire. There is a freepost envelope included with it, so it will not cost you any thing to return it to us.

If you would prefer to speak to me about how you are getting on, please telephone me on 647 2966.

Your answers are very important to us. They will be used to inform the future of this scheme and others like it, so that others like you can benefit from better health.

Many thanks,
Yours faithfully,

Helen Beers
Exercise and Lifestyle Evaluator

Appendix 9

*3rd Floor. Argyle Buildings,
69 - 71 Argyle Street. Birkenhead CH41 6AB
Telephone 0151 647 2966*

Name

Address

Postcode

Date August 2002

Dear

Exercise and Lifestyle Centres Physical Activity Study

You are being invited to take part in a study about physical activity. The purpose of the study is to evaluate the Exercise and Lifestyle Centres scheme and to understand the reasons why some people decide to take part and others do not. The results will be used to inform the future of the scheme and others like it.

You may have decided not to join the Exercise and Lifestyle Centres scheme. However, I am still interested in your views on physical activity, your experience when you were referred to the scheme and your thoughts about the scheme in general.

Before you make a decision about taking part in this study, it is important that you understand why it is being done and what it will involve. Please read the enclosed information sheet and discuss it with others if you wish. After reading this, if you would like to ask any questions about the study please telephone me on the number at the top of this letter.

Your participation in this study is voluntary and you do not have to take part. Your future health care and participation in the Exercise and Lifestyle Centres activities will not be affected by your decision. If you do decide to take part you are free to withdraw from the study at any time without giving a reason.

If you would like to take part, please complete and return one copy of the consent form in the reply paid envelope no later than (3 weeks from the date of the letter). I look forward to hearing from you and hope that you will be able to help us with the study.

Yours faithfully,

Helen Beers

Exercise and Lifestyle Centres Evaluator

Appendix 10

*3rd Floor, Argyle Buildings, 69-71 Argyle Street
Birkenhead CH41 6AB
Telephone 0151 6472966*

Information Sheet

Please read the following information and discuss it with others if you wish.

How have I been selected?

Your name has been selected since you were referred to the centres by a health professional between October 2001 and March 2002.

Do I have to take part?

You do not have to take part. If you do take part, you are free to withdraw from the study at any time without giving a reason.

What will I have to do?

You will be asked to take part in one interview, which will be recorded on tape. This will take the form of an informal conversation between you and Helen Beers. Anything you say will be treated in the strictest confidence. You will be asked about your health and levels of physical activity. You will be asked to say what you think about physical activity and also about your experiences when you were referred to the Exercise and Lifestyle scheme. If you decided not to participate in the scheme, you will be asked why you decided not to take part. If you did participate in the scheme, you will be asked about why you decided to participate, about your experiences whilst you were on the scheme and after you completed it.

How much time will it take?

The interview will last between approximately 30 minutes and one hour, depending on whether you took part in the Exercise and Lifestyle scheme or not (if you did not take part, the interview will be shorter).

Where will I have to go to take part?

The choice of where the interview takes place is up to you. You can decide to speak to me over the phone if this is most convenient to you. The location may be your own home, the Exercise and Lifestyle Centres offices or one of the local Leisure Centres in Wirral.

What about confidentiality?

The interview tape will contain no reference to your identity, it will just be given an identification number. Information on the tape will be typed up after the interview and the tape will then be wiped clean. Quotes from the interview may be used in reports and this will be done without any reference to your identity. All documents and tapes will be held in a locked cabinet in the Exercise and Lifestyle Centres offices and Helen Beers will be the only person who has access to them.

What happens next?

If you have any questions, please call me at the Exercise and Lifestyle Centres on the number below. If you do not wish to take part, you do not need to take any further action and you will not be contacted again. If you do decide to take part in the study, please complete one copy of the consent form by putting your initials in the box next to each paragraph to confirm you have understood each one. Finally complete your personal contact details and sign the form. This should be returned to me in the reply paid envelope. I will then contact you to arrange a day, time and place for us to speak. Please keep the other copy of the consent form and this information sheet for your records.

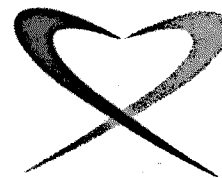
Helen Beers

Telephone 0151 647 2966

Appendix 11

*3rd Floor. Argyle Buildings, 69 - 71 Argyle Street
Birkenhead CH41 6AB*

Telephone 0151 6472966



EXERCISE & LIFESTYLE CENTRES

Consent form

An investigation of physical activity participation in individuals referred to the Exercise and Lifestyle Centres programme in Wirral.

Please put
initials in the
box

I have read and understood the information sheet relating to the study about physical activity and the Exercise and Lifestyle scheme. I know what the study is about and what it aims to achieve.

I have had the opportunity to ask questions if I wanted to.

I agree to my interview being tape recorded and that quotes from this may be used in a report. Quotes used will not have any reference to my identity.

I understand that the information I provide will be kept confidential and that the tape will be destroyed after it has been typed up. There will be no reference to my identity on the typed transcription of the interview.

I understand that my participation is voluntary and that I am free to pull out of the study at any time should I choose to do so.

I agree to take part in the study.

Name

Address

Postcode

Contact Phone Number

Signature

Date

When is the best time to phone you to arrange an interview?

Appendix 12

Interview Schedule

(Sections A and B only for those referred but who did not participate).

“I have received a signed consent form from you and would just like to confirm that you’d still like to talk to me about the Exercise and Lifestyle scheme and physical activity. You don’t have to talk to me if you don’t want to and are free to pull out of the study at any time.

I can assure you that anything you say will be treated in confidence. The interview will last approximately half an hour / one hour and I would like to tape record it, with your permission.

I am interested in your thoughts in general about physical activity and also about your experiences when you were referred to the Exercise and Lifestyle scheme, (and whilst you participated on it).

To begin with, I would just like to ask you a few factual questions, and then to talk more generally about why you decided to participate in the scheme and your experiences whilst on the scheme and after you finished it”.

Section A

1. What area of Wirral do you live in?
2. Where were you born?
3. How old are you?
4. What is (was) your occupation?
5. What is your marital status?
6. Do you have any children?
7. How old are they?
8. Are they living at home with you?
9. Do you smoke? How many a day?
10. Do you drink alcohol? How much on an average week?
11. How did you find out about the Exercise and Lifestyle programme?
12. Who referred you to the programme?
13. Why did they refer you to the programme?

Section B

Now I’d like to ask you about the time when you were referred (before you joined the scheme)

What was your health like at this point?

What kind of physical activity were you doing? (use checklist to prompt)

How often did you do this? (once a week, once a month...)

For how long at each time?

Over what time span did you do this? (a week, a month)

When you visited your GP/referrer, could you tell me what they told you about the scheme

How did you feel about this?

What did they tell you about physical activity in general?
How did you feel about this?

What were your feelings about physical activity?
Did you believe you could do it?
Did you have confidence to do it?
Did you think you had the physical ability to do it?
Did you really want to do it?

Could you tell me about any concerns you had about joining the scheme?

Could you tell me what made you decide to take part? (not to take part)
What did you expect to happen?

What did you expect to achieve?

Did you feel optimistic about what you might achieve on the programme?

Did you have any particular goal(s)?
What was this?
How important was this to you?
Why was this important to you?

Section C

I would now like to talk about the time whilst you were on the scheme

What type of activity did you do during the 12 weeks?

At home

In the centres

Did this activity change during the 12 weeks?

How?

Why?

How were you feeling whilst you were on the scheme?

Was your belief in your ability to do the activity changing?

Did you have more confidence?

Did you feel that you were more physically able to do physical activity?

Were you gaining any benefits?

How were you feeling in yourself at this point?

Were you enjoying it?

Could you tell me about any commitments you had to alter whilst you were on the programme?

Were there any pros and cons associated with this?

What were they?

Did you experience any set backs to your activity?

What were they?
How did they affect you?
What did you do?

Did you experience any disruptions to your activity?
What were they?
How did they affect you?
What did you do?

Did you learn anything during the scheme?
What was this?
Was this important to you?
How is it important?
Why is it important?

Section D

I would now like to move on and talk about when you finished the scheme

What was your health like after the 12 weeks?

Why do you think that you completed the scheme? (did not complete?)
What did you achieve?
Were you satisfied with your achievements?

How did what you achieved match up to your expectations?
Did you enjoy it?
What in particular did you enjoy?
What didn't you enjoy?

Were there any down sides to taking part?
Did you experience any difficulties?
getting to the venues
problems with the venues
problems with the advisors
problems with the support received
attending at set times
any other activities you had to miss

Section E

Finally I would like to talk about the time since you finished the scheme

What type of physical activity are you doing now?

How often?

For how long?

Over what time span did you do this? (the last week / month / 3 months)?

Why do you think you are doing this?

What are your feelings about physical activity now?

How is your health now?