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Determinants of attendance
in
a countywide physical activity referral scheme

Adrienne Horatia Sidford

**A thesis submitted in partial fulfilment of the requirements of
Sheffield Hallam University
For the degree of Master of Philosophy**



30 November 2006

Collaborating organisation: Taunton Deane Primary Care Trust

The evidence of the benefits of physical activity for health is unequivocal. Physical activity referral schemes (PARSs) have grown exponentially in the last decade, and are a popular way for primary care trusts (PCTs) and local councils to meet the growing targets set by the Government to promote physical activity to the increasingly sedentary population. However, the efficacy of PARS to increase physical activity and in turn health has yet to be proven. Little is known about the determinants associated with uptake of referral and progress through schemes, as there is little published data following patients from point of referral. This prospective cohort study aimed to explore the influence of referral scheme processes and participant characteristics upon their access to, and exit from, the scheme. The dataset is unique as it contains a large cohort of participants ($n=2958$), and follows them from initial point of referral by their health professional until their discharge from the scheme. Scheme process variables were arranged into categories that represented the public health policy and physical activity context of the current study. Logistic regression was used to analyse the data, as it allows the prediction of a discrete outcome, such as scheme attendance level, from a set of variables of mixed data types, such as age and referring health professional. Findings predicted the scheme processes and participant characteristics that were associated with the four stages that marked participants' journeys through the scheme. More women (62.3%, $N=1842$) accessed the scheme via their health professional than men, while those with mental health and overweight/obesity referral reasons were consistently less likely to progress through contact (mental health OR 0.353 CI 0.188-0.663 $P=0.001$, overweight OR 0.586 CI 0.362-0.951 $P=0.03$), allocation to leisure provider (mental health OR 0.550 CI 0.338-0.896 $P=0.016$, overweight OR 0.695 CI 0.495-0.975 $P=0.035$) and attendance of one or more sessions with a leisure provider (mental health OR 0.399 CI 0.275-0.579 $P=0.001$, overweight 0.639 CI 0.501-0.814 $P=0.001$). Older participants (OR 1.016 CI 1.010-1.023 $P=0.001$) and men (OR 1.00 – Reference value) were more likely to complete their planned physical activity sessions than younger or female (OR 0.823 CI 0.681-0.994 $P=0.043$) participants. Highlighting that PARSs do have a place within public health, but that those with obesity/overweight and mental health referral reasons need greater support to progress through the scheme and access physical activity. This study is the first to explore the impact of scheme processes upon participants journey through PARS, and the contribution of scheme processes upon participants' use (attendance) of PARS. This prospective cohort study marks a move away from previous research designs used to evaluate PARS. Although PARS are not the answer for public health, and the population level behaviour change needed, they should be acknowledged for providing a supported introduction to physical activity for specialist populations and as this study found, can be successful mediums for targeted groups of individuals to accomplish regular attendance to a physical activity programme over a period of time.

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Candidate's statement

The objective of this thesis is to investigate the influence of physical activity referral scheme processes and participant characteristics in relation to scheme progress outcomes of a rural physical activity referral scheme. Data collection was undertaken as part of scheme processes by the researcher. Published materials were sourced using literature searches engines (PubMed, PsychInfo and SportsDiscuss), manual literature search methods, library catalogue, Government and other relevant internet sites, the British Library and Senate Library (see full Reference section at the end of Chapter 8).

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'If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health'

(Hippocrates, 460-377 BC)

1.1 Physical inactivity and health

Over the past century peoples' lifestyles throughout the Western World have dramatically changed, owing to the increasingly privileged lifestyle that humans have not yet learned to adapt to (Morgan 2001). This has resulted in a growing epidemic of physical inactivity and associated diseases.

Physical inactivity is globally recognised as a major cause of chronic physical and psychological diseases including cardiovascular disease, diabetes, obesity, osteoporosis, some cancers (Paffenberger, Hyde, Wing et al 1986; Pate, Pratt, Blair et al 1995; Wanless 2003), depression and anxiety (Biddle, Fox & Boutcher 2000; Wanless 2003). This is equal to the health risks of smoking tobacco or an unhealthy diet (World Health Organisation 2003b). This recognition is a significant step that strengthens the argument for promoting physical activity and reinforces the level of support by the Government.

Non-communicable diseases (NCDs) associated with inactivity cause the majority of deaths (59%) and diseases (46%) throughout the world (World Health Organisation 2003b). The most prevalent of these is high blood pressure, which is a risk factor for coronary heart disease and stroke (Wanless 2003). In European, American and Western Pacific Regions 80% of deaths are attributed to NCDs (World Health Organisation 2003b). Increasingly, public health has called for the promotion of physical activity in policy guidelines and targets.

The evidence for leading a physically active lifestyle for positive health benefits is unequivocal (Grant 2000; Paluska & Schwenk 2000; Pate et al 1995). The cost of inactivity and associated diseases in England is estimated as £1,890

billion a year of days lost to industry and premature death (DCMS Strategy Unit. 2002). So it is perhaps not surprising that physical activity promotion has been identified as the best buy for public health (Morris 1994).

Currently the recommended level of physical activity to benefit health for adults is thirty minutes of moderate intensity physical activity, such as continuous brisk walking or cycling (amongst others) on five or more days a week (Department of Health 2005; Health Education Authority 1995; Pate et al 1995). Preferably, these periods of physical activity should be continuous, but shorter accumulative bouts are also beneficial (Health Education Authority 1995; Pate et al 1995). These guidelines offer achievable objectives that are more realistic for encouraging sedentary individuals to increase their physical activity levels than the previous guidelines that recommended vigorous intensity physical activity.

Despite the awareness of the benefits of being physically active, only 37% of men and 25% of women in England achieved the physical activity level targets (Department of Health 2000d). Whereas in Somerset, less men (30%) and slightly more women (27%) achieved the targets (Somerset Health Authority 1999).

1.2 Physical activity and health policy

By 2020 the Government aims for 70% of the population to meet the recommended physical activity levels (DCMS Strategy Unit. 2002). The Government's commitment to achieve this target and improve the nations health is highlighted by forecast spending of up to £60 million on smoking cessation over three years (The Stationary Office 1998), while spending on physical activity and sport was estimated as £2.2 billion (DCMS Strategy Unit. 2002). In comparison, countries that have higher levels of physical activity such as Finland are considered successful due to their high public spending. The Finnish Government and the private sector spend around 4% of total public expenditure on physical activity, since the responsibility of employees health is also placed on corporations (DCMS Strategy Unit. 2002).

An historical perspective

The Government first acknowledged the important role of physical activity in the prevention and treatment of target conditions over a decade ago when they included physical activity in their strategy to improve the nations health (Department of Health 1992) and strengthened their resolve later in 'Saving lives: our healthier nation' (Department of Health 1999c). It is no coincidence that this acknowledgement corresponded with the strength of evidence of the positive health benefits that physical activity bestows (Pate et al 1995; United States Department of Health and Human Services 1996) and the escalating levels of physical inactivity throughout the Western World.

Following the Government white papers, National Service Frameworks (NSFs) ensured that physical activity was high on the public health agenda, outlining the services for target conditions and populations. In varying degrees, these all called for the promotion and implementation of physical activity for both disease prevention and treatment. NSFs included targets for the promotion of physical activity in the NSF for Coronary Heart Disease (CHD), Diabetes, Mental health, and Older people (Department of Health 1999a 2000a 2001b 2001c). These documents ensured that physical activity, particularly in the form of PARs, would be high on the public health agenda by endorsing physical activity to population groups that are perceived to need supervised physical activity, delivered by appropriately qualified exercise professionals such as those found in PARs.

Importantly, the NSFs also recognised the potential of physical activity alongside healthy lifestyle promotion to prevent conditions through the reduction of risk factors (smoking, poor diet, inactivity and overweight) (Department of Health 1999a 2000a 2001b 2001c). The NSF for older people, on the other hand, was mainly concerned with the promotion of independent healthy active living and to prevent discrimination (Department of Health 2001c 2003). Whilst in contrast, the NFS for diabetes promoted physical activity for the prevention and management of type 2 diabetes and health improvement of those with type 1 diabetes (Department of Health 2001b).

Similarly, the aim of the NSF for coronary heart disease (CHD) was to reduce deaths and conditions related to CHD by 40% by 2010 (Department of Health 1999c). To accomplish this the NSF for CHD also recommended the development of policies to reduce associated risk factors and set targets to increase the number of patients (85%) offered cardiac rehabilitation following a heart attack or revascularisation. Setting a physical activity and risk factor maintenance target (50%) ensured that there are follow-on activity groups and that participants are encouraged to be independently physically active.

However, the rewards of a physically active nation are twofold, since both the individual and Government benefit. A decrease in the severity and prevalence of conditions decreases the public health burden, for example, by meeting physical activity targets for falls, stroke prevention and mental health (Department of Health 2001c). Meeting these targets will arguably also reduce the public health burden of older people upon the NHS, which currently accounts for a third of all spending. An update on progress of the Older people NSF reported an increase in the delivery of 'active aging programmes' by local councils (Department of Health 2004c).

People with mental health problems are reported to have poorer health and lifestyles than the general population (Crone, Heaney, Herbert et al 2005a; Department of Health 1999a). A study looking at the lifestyles of people with significant mental illness reported that they were generally inactive and significantly less healthy in comparison with the general population, as there were significant differences in healthy eating, smoking and BMI (Crone et al 2005a; The Mental Health Foundation 2005a). Guidelines for the treatment of those with mild to moderate mental health problems include physical activity promotion (Department of Health/DCMS 2004a; National Institute of Clinical Excellence 2004a; The Mental Health Foundation 2005). Choosing Health (Department of Health/DCMS 2004b) and the commissioning framework document specifically targeting people with severe mental illness (Department of Health 2006c), provides practical suggestions for good mental health, including physical exercise and support. Guidelines for practical delivery of physical activity for those suffering from mental health conditions call for the

implementation of support mechanisms for this client group (Grant 2000; The Mental Health Foundation 2005). The Mendip area of the ProActive scheme offered some support for those referred with mental health problems, but this was only available for those referred through mental health services (Grant 2000).

Despite the consensus of evidence concerning the benefits imparted by being physically active, there is still a lack of evidence concerning interventions that are effective in increasing uptake and maintenance of physical activity (Dunn 1996; Dunn, Marcus, Kampert et al 1999), and the effectiveness of a commonplace intervention; PARSs (Gidlow, Johnston, Crone et al 2005; Riddoch, Puig-Ribera & Cooper 1998). In particular, the lack of evidence regarding the influence of referral processes (Department of Health 2001a; Riddoch et al 1998) upon participants progress through a PARS has received little if any attention.

Current public health focus on delivery

Following the NSFs and the failure to meet the targets set out for physical activity promotion, the white paper 'Choosing health' (Department of Health/DCMS 2004b) was followed closely by the publication of 'Delivering choosing health' (Department of Health 2005) which set out how the targets in choosing health will be delivered. Game Plan document set targets to increase physical activity levels by 70% through both sport and lifestyle activity of the population by 2020 (DCMS Strategy Unit. 2002). However, the sport-orientated nature of this document may have been problematic for the predominantly sedentary population. The target was set by the high level of sports participation of Finland and Sweden.

The lack of targets to monitor progress in previous white papers culminated in the recommendations of the Wanless report (Department of Health/DCMS 2004a) and resulted in the public health targets and clear strategies to deliver them (Department of Health/DCMS 2004b). This has resulted in National Health Service experiencing a revolutionary change in its public health approach, placing greater emphasis upon health promotion and individual

responsibility, 'advice from on high to support next door' (Department of Health/DCMS 2004b p. 102). The aim is to create increased demand for health through the marketing of healthy lifestyles and, in turn, reduce health inequalities. The Government has started the introduction of 'health trainers', accredited by the NHS in order to meet the recommendations and targets outlined in their white paper (Department of Health/DCMS 2004b).

It is envisioned that health trainers will work in the community, providing advice and support on all health issues and be a part of a wider workforce that will provide health promotion. They will support colleagues in primary care and health professionals throughout the NHS, of whom, many more will have the skills to promote healthy lifestyle to patients that they come into contact with (Department of Health/DCMS 2004b). The Government has increased funding to provide this service, but this comes with an insistence on value for money, quality and strengthens the view of users (patients) as consumers. The role of health trainers is as follows:

- Help individuals identify the changes they would like to make (such as stopping smoking, increasing physical activity levels, healthy eating, practising safe sex, reducing stress and tackling social isolation).
- Provide the advice and the necessary support to achieve them by supplying the skills for people to care for their individual health needs, and help with making better use of lifestyle information – on making and sustaining changes over time.
- Act as a conduit to other services within the NHS (for example, smoking cessation, dieticians, sexual health and/or counsellors,) and in the community (for example, swimming pool, local support groups, healthy walks, physical activity referral schemes)

Summary

Successfully increasing physical activity levels across the population could help to reduce the consequences associated with the inactivity associated with a privileged lifestyle. The Government have set targets to increase physical activity levels in the population and promote physical activity to both reduce risk

factors and symptoms of target populations. Physical activity referral schemes are a popular way for PCTs to meet these targets.

1.3 Physical activity referral schemes

Considering the well documented evidence surrounding the benefits of physical activity, it is not surprising that physical activity referral schemes (PARSs) are rapidly becoming a panacea for all ills (Dugdill, Graham & McNair 2005). PARS are an increasingly popular intervention used to meet Government targets to reduce health inequalities, despite there being little evidence of their effectiveness (Biddle, Fox & Edmunds 1994; Crone, Johnston & Grant 2004; Gidlow et al 2005; Riddoch et al 1998). Guidelines for the effective use of PARS and individuals that would most benefit from their services were set out for referring health professionals (Department of Health 2001a). These guidelines also contain recommendations to quality assure scheme processes and ensure participant safety and enjoyment.

The acknowledgement by public health and service commissioners that PARS provide only one small part of physical activity promotion to the population (Riddoch et al 1998), will ensure the development of different services to meet the specific needs of target populations, such as community walking programmes (Ashley & Bartlett 2001). Recognition of the important role that PARSs play in meeting policy targets was revealed by the publication of Government guidelines for the quality assurance and provision of improved services by physical activity referral schemes (PARS) (Department of Health 2001a). PARS provide fully supervised physical activity to specialist populations and those that need more support.

The traditional model for PARS involved the opportunistic recommendation of physical activity by a health professional, usually a general practitioner (GP), during a routine appointment. Physical activity is usually tailored and supervised at a local leisure centre. Access to PARS is dependent on many factors, including whether the health professionals considers the scheme will be beneficial for their patient and barriers to referral, such as, time and sedentary behaviour. To access the scheme the patient consents, which is

influenced by their individual barriers and motives for taking up physical activity and the impact of their GP. Initial attendance with a leisure provider is thought to be influenced by similar factors.

It is quite possible that both scheme processes and participant characteristics influence progress through the scheme, in terms of the points in the scheme where participants continue or stop progressing through the scheme (see Figure 4.3). Differences of population groups in relation to referral processes (such as, type of referring health professional or leisure provider) and participant characteristics (age, gender and referral reason) may provide insight into which facets determine success (progress through the scheme) and may assist in determining the needs of some groups, in relation to perhaps additional support, appropriateness of PARS or alternative service provision.

This study aims to explore the influence of referral scheme processes and participant characteristics upon participants progress through the scheme.

1.4 Research questions and context of thesis

In light of the need to investigate the influence of scheme processes and participants characteristics on their subsequent progress through a PARS, the aims of this thesis was addressed through the following research question:

Research question: To what extent do certain facets of the referral processes (referring health professional, central referral mechanism and leisure provider) and patient characteristics (age, gender, referral reason) relate to scheme attendance levels?

This research question is concerned with differentiating participants in relation to scheme processes and their individual characteristics, in order to assess whether they act as determinants of the progress of participants through the scheme. In particular, to investigate which facets of scheme processes altered the likelihood for participants progressing through the scheme. Scheme processes that are related to less successful progress may be identified and

compared with more successful processes, with the possible view of improving scheme effectiveness. Participant characteristics associated with success may provide an insight into which population groups the scheme is most suited to. Whereas, certain outcome may be related to different participant characteristics or scheme processes, they may be explained by greater barriers for certain population groups, which may assist in the provision of more tailored scheme services in future.

Unique characteristics of ProActive

The current study evaluated a large, established, co-ordinated rural countywide PARS, which has been cited as a model of good practice (Biddle, Fox & Boutcher, 2000: p.5). The implementation of the first quality assured systems (Crone et al 2004) ensured that the scheme had unique characteristics which, at the time, included; a central referral mechanism (CRM) (Section 3.2.6), recognition and accreditation of leisure providers (Section 3.2.4), support services and development workshops for scheme staff (Section 3.2.3). In addition, data collection did not affect scheme processes as it was incorporated into them. This provided a unique dataset, since participants progress was followed and monitored from their initial point of referral by their health professional through each of the scheme processes until they were discharged from the scheme, providing exclusive access to the data associated with those that exited the scheme after being referred. The data was also very detailed in relation to tracking participants' progress through referral processes (Figure 4.2), allowing comparison of participants at each stage.

Context of thesis

When this thesis was conceived no PARS evaluation had investigated the processes of PARS using a prospective cohort design. The merits of this method are recognised by Sallis and Owen (1999), in particular the ecological validity of the prospective cohort methods they were using to identify the complex determinants of physical activity (Sallis, Hovell & Hofstetter 1992; Sallis, Hovell, Hofstetter et al 1990; Sallis, Johnson, Calfas et al 1997). The retention of scheme processes, often lost in other study designs, is crucial to

process investigations. As PARS themselves are embedded within both public health policy and physical activity research, this thesis falls within both areas of work. Findings were considered from both a public health and physical activity perspective. Undoubtedly, there is a considerable amount of literature that explains health behaviours in relation to psychological theories. However, this thesis was principally interested in the influence of the PARS setting, in relation to the influence of scheme processes and participants' individual characteristics. It also provides a unique perspective in contrast to the majority of PARS evaluations, which are often limited due to study design compromising traditional characteristics of schemes, through controlling variables or randomisation. Additionally, the explanations of findings are often in relation to scheme effectiveness, physical activity outcome levels and psychological theory.

Scheme process variables and participant characteristics were used to differentiate participants and also act as possible determinants for participants progress through the scheme, since there is some evidence for associations with some of the variables that make up scheme processes and participants characteristics in relation to physical activity, however these have been investigated in isolation and have not all been explored in relation to referral scheme processes. It was possible to investigate the influence of these variables due to the socio-ecological perspective of this thesis (Sallis & Owen 1999).

1.5 Thesis structure

- Chapter 2 examines the evaluation methods currently used within public health and in turn to evaluate PARSs. The associated problems with these methods to date have resulted in a lack of evidence, particularly in relation to the influence of schemes in relation to participant attendance levels, prompting greater discourse regarding suitable evaluation methods and a call for methods to evaluate PARS to move away from RCT style evaluations.
- Chapter 3 provides an overview of the previous studies examining outcomes of physical activity referral schemes (PARSs) in relation to

scheme processes and participant characteristics. It also places this research, provides the background of the ProActive PARS and an explanation of the scheme processes, which are central to this research.

- Chapter 4 describes the context of the current study, justifies the research methods and approaches used. The approach of the current study differs from the traditional methods used to evaluate PARS, in order to examine the influence of scheme processes and in turn ecological validity it uses quasi-experimental methods. Finally, the methods used are described.
- Chapter 5 initially describes the characteristics of the cohort that agreed to be referred onto the scheme by their health professionals. The results of each of the four logistic regression models, highlights determinants that relate to participants progress through each phase of the scheme.
- Chapter 6 initially discusses the characteristics of referred participants and continues to examine the determinants of attendance that arose from the four logistic regression models that relate to participants journey through the scheme.
- Chapter 7 conclusions from the most pertinent results are discussed, how they have changed practice, implications for practice and research and how they relate to Government policy.
- In Chapter 8 the researcher reflects on the contribution of experience of working on the PARS, the research process, the impact of her own influence upon the thesis and the interpretation of the literature and results.

This chapter sets out to discuss how the evaluation methods currently used within public health have influenced the evaluation methods used for PARSs. Using these methods have to date resulted in a lack of evidence, particularly in relation to the influencing facets of schemes in relation to participant attendance levels. This has prompted greater discourse amongst PARS researchers regarding suitable evaluation methods and a call to move away from RCT based evaluations.

2.1 Introduction

Public health is calling for the evaluation of the escalating number of PARS, which continue to be popular with both participants and practitioners. To date research on PARS has been limited to a few good quality evaluations, which has resulted in a paucity of evidence to support their use as an intervention for public health (Department of Health 2001a; Gidlow et al 2005; Riddoch et al 1998) (Section 3.1). As a consequence of the call for rigorous evaluations, there is growing discussion regarding suitable evaluation methods for PARS and the need for evaluators to ask different questions, other than in relation to effectiveness, in order to provide new evidence to inform practice. This is partly due to the focus of previous studies on individual factors rather than the influence of the setting itself. Socio-ecological methods (Sallis & Owen 1999), such as the current study, provide greater understanding of the influences of intervention itself by examining the factors linked with the social and physical environment. Public health practitioners are critical of researchers, as the evidence is difficult to translate into policy and practice. This is partly because researchers do not make explicit recommendations for the practical development of programmes and policies based on their findings, and as Smith and Bird (2004) noted in their review, there is a lack of contextualised research.

2.2 Evaluation in public health: definition and methods

Definition

Evaluation is a process that is carried out regularly, and comprises of: standards against which we can review outcomes, it enables us to learn from experience, and it provides a set of procedures to judge the worth of an activity (Oakley 2001). Studies such as the current one, that aim to describe processes and outcomes are termed as evaluations.

Research approaches of PARS and public health

PARSs are a form of health promotion and, as such, sit within both public health and exercise science domains. Unsurprisingly perhaps, the evaluation methods in health promotion are a matter of contention and continuing discussion concerning the strengths of researchers particular approaches. These come from two different schools of thought (paradigms). Those that advocate 'bio-medical' approaches and those who promote 'social' models for research and evaluation. Bio-medical evaluation involves scientific research that is either experimental or quasi-experimental, resulting in numeric data analysis (Altman 1994; Springett 2001; Thomas & Nelson 2001; Victora, Habicht & Bryce 2004). Social evaluation represents people, places and processes using a descriptive form of investigation, such as content analysis or other forms of description to represent the themes arising (Denzin & Lincoln 2000; Strauss & Corbin 1998). Furthermore, although many researchers associate 'process' with 'qualitative' research methods, this is not the case, as the socio-ecological models championed by Sallis and Owen (1999) illustrate.

Rationale for evaluation in public health

The Government has called for policy to be based on evidence (Stationary Office 1999) ensuring that evaluation has become a central part of public health policy and practice. The reasons why well designed outcome evaluations need to have a key place in health promotion research (Campbell, Fitzpatrick, Haines et al 2000; Oakley 2001) are because health promotion can do harm as well as

good, or have no effect at all, and can depending on the intervention, be costly (Glasgow, Vogt & Boles 1999; Macintyre & Petticrew 2000; Rychetnik & Wise 2004). Additionally, since health promotion programmes generally target primary prevention rather than the treatment of the sick (Rychetnik & Wise 2004), programme commissioners need to ensure that interventions are beneficial and strive for improvement and development. These programmes are continually evaluated, adding to the body of knowledge and providing examples of 'best practice' for other practitioners to use.

Rationale for evaluation methods in physical activity

Physical activity research moved to large prospective cohort studies half a century ago lead by Professor Morris in 1958. Over almost three decades population studies have significantly increased the knowledge base regarding both the health risks associated with physical inactivity and the predictors of physical activity (e.g., Blair, Kohl, Barlow et al 1995; Blair, Kohl, Paffenbarger et al 1989; Paffenbarger et al 1986; Paffenbarger, Wing & Hyde 1978; Sallis, Haskell & Fortman 1986; Sallis et al 1992; Sallis et al 1990; Sallis et al 1997; Sallis & Owen 1999). These studies were able to explore the complex variables associated with real world population behaviour and as such provided evidence that predicted the increased or decreased risk to health associated with health behaviours and individual characteristics. Unlike in physical activity research, large cohort studies have had little place in the evaluation of PARS, with the exception of Harrison, McNair and Dugdill (2005a).

Importantly, Sallis and Owen (1999) recognised the significance of the ecological validity of the prospective cohort methods they used. They were observing, not controlling, large population groups and in turn, the environmental and individual characteristics that predicted physical activity outcomes. The use of socio-ecological models in the evaluation of physical activity, allows comparison to other similar population groups, provides a fuller understanding due to the measurement of the potential impact of social and environmental characteristics upon whether people were active or not (Sallis & Owen 1999). This is particularly important for physical activity referral schemes, since they have complex processes (such as referring health

professional and leisure provider context) that may have an impact upon participants' attendance. Recently Harrison et al (2005a) undertook the first large prospective cohort study of a PARS that investigated which scheme processes determined participants accessing a scheme (the findings of this study are detailed in Section 5.3.3).

2.3 Evaluation in physical activity referral schemes

With the recent exception of Harrison et al (2005a), large cohort studies have not been employed within PARS. Apart from the dominance of other evaluation methods, this is possibly due to practice based schemes not being research projects (Smith & Bird 2004). Controlled studies are recommended by the current NIHC criteria (National Institute for Health and Clinical Excellence 2006a).

Process information, central to the current evaluation, is increasingly being seen as important, as it provides a greater understanding of why and how programmes work in their individual settings (Blamey & Mutrie 2004), which enhances the study's ecological validity (Sallis & Owen 1999). It is vital to link such process information to the outcomes measured from more traditional evaluation methods (Riddoch et al 1998). Resulting in a call by the Government for the future evaluation of PARS which put forward guidelines for the evaluation of process variables in relation to scheme outcomes (Department of Health 2001a).

Other studies have overcome the problems of small datasets to investigate the impact of physical activity scheme processes, by examining them in relation to participants' experiences. They used designs appropriate to their research questions, by using qualitative methods (Crone, Smith & Gough 2005c; Hardcastle & Taylor 2001; Singh 1997) that select participants to answer their research questions. These studies have ecological validity, since they are using the participants' experiences to investigate the ecological and social impact of the schemes. Whereas, prospective cohort studies add to this information as they give odds ratios relating to the likelihood of participants attendance of the scheme in relation to the scheme processes that they have

come into contact with. However, the important evidence-based practice contributions that these qualitative studies make in the development and improvement of PARS and physical activity interventions are rarely highlighted in evidence, due to the review criteria imposed.

The findings from Harrison et al's (2005a) prospective cohort study (PCS) of a PARS illustrates the strengths of socio-ecological method and the need for researchers to move away from the traditional research methods associated with health promotion and PARS. This method captured the context of an established community intervention, as the PCS observed variables as they happened, since processes were observed and measured rather than manipulated. In turn, this provided evidence which is transferable to other PARS.

Evaluation method recommendations

Almost a decade ago, possibly in acknowledgement of the different methods used by other research areas, such as physical activity research mentioned earlier in this Chapter, the World Health Organisation (WHO) (1998) recommended that policy makers consider different ways of evaluating health promotion. This was because they considered the dominant medical science methods inappropriate for the evaluation of the complex activities associated with health promotion programmes (World Health Organisation 1998).

However, this recent increasing call for health promotion evaluations of physical activity and PARS to move away from methods associated with drug trials has been undermined by the recent guidelines from a review of evidence of PARS by the National Institute of Health and Clinical Excellence (NIHCE) on behalf of the Department of Health (DoH) (National Institute for Health and Clinical Excellence 2006a). NIHCE has recommended that health professionals should only refer patients to PARS where the scheme is part of a controlled research study to determine effectiveness (National Institute for Health and Clinical Excellence 2006a). The recommendations made by NIHCE are less surprising considering that their primary remit involves assessing the evidence for different (medical) treatment options for patients. Commissioners

and fund-holders distort the evidence base, due to their seeming lack of flexibility over study design type, perhaps due to a lack of understanding of the phenomenon being examined (National Institute for Health and Clinical Excellence 2006a).

Current thinking in exercise science, summarised by Smith and Bird (2004), calls for greater contextualisation of studies so that the facets of interventions are captured to help understand the impact upon participants and inform practice to improve the delivery of these schemes. Similarly, much of the discourse surrounding methods of evaluation in health promotion, which is also starting to occur within PARS, is resulting in recommendations for greater diversity in evaluation methods (Department of Health 2001a; World Health Organisation 1998). This is despite the guidelines, by both WHO and DoH for policy makers, which recommended the use of methods suitable to the phenomenon being evaluated (Department of Health 2001a; World Health Organisation 1998). Both advise a move away from controlled trials for evaluating physical activity behaviour.

Researchers are calling for a move away from the use of randomised controlled trials (RCTs) for the analysis of social phenomena such as physical activity. The values underlying RCTs are in opposition to those of physical activity as a form of social action (Campbell et al 2000; Oakley 2001; Thomson, Hoskins, Petticrew et al 2004), since RCTs set out to control and strip away the layers (Dugdill et al 2005), resulting in the loss of key scheme characteristics (such as referring health professional). Finally, RCTs are in opposition to the political and ethical issues of withholding treatments that may be beneficial (Blamey & Mutrie 2004; Dugdill et al 2005; Macintyre & Petticrew 2000; Thomson et al 2004).

In 2001 the Department of Health published national quality assurance guidelines for physical activity referral schemes, in which they made recommendations for the best way to evaluate schemes in order to provide evidence-based practice (Department of Health 2001a). These guidelines for PARS evaluation are very narrow and brief. Firstly, there is no clear structure. Secondly, it focuses on RCTs as a measure of scheme effectiveness without

discussing the merits of any other methods, only briefly mentioning 'auditing' and 'reflective practice'. Thirdly, they presume that exercise professionals will take measures, which may lead to a simplistic design and a focus on physiological change (DCMS Strategy Unit. 2003; Dugdill et al 2005), which has previously been criticised in the PARS literature (Crone et al 2005c). They do however call for an investigation of scheme but not for improved evaluation design (Fox, Biddle, Edmunds et al 1997; Riddoch et al 1998).

In sharp contrast to the Department of Health guidelines mentioned earlier, which offers little or no explanation or framework to assist evaluation (Department of Health 2001a) and the NIHC guidelines (2006a), the WHO recommendations (1998) strongly advocate a move away from designs traditionally used in health promotion. In conclusion four, they state, 'the use of randomised controlled trials to evaluate health is, in most cases, inappropriate, misleading and unnecessarily expensive.' (World Health Organisation 1998: p.5). In order for researchers to incorporate the guidelines, they make several recommendations; that at least 10% of a programme budget be set aside to fund the evaluation, that evaluation is in process terms as well as outcome, use of multiple methods to evaluate programmes and the development of appropriate approaches for evaluating health promotion in the future (World Health Organisation 1998).

The WHO recommendations for evaluation of health promotion are also more detailed (World Health Organisation 1998) than the Government recommendations for PARS evaluation (Department of Health 2001a). They propose in particular; participation, multiple methods, capacity building and appropriateness are central characteristics of health promotion evaluation. The WHO recommended firstly, that public health evaluations involve the input of stakeholders (for example, policy makers, community members, organisations and health care professionals). Secondly, evaluators implement study designs that use a broad range of disciplines and information gathering procedures. Thirdly, the programmes that are put in place should enhance the capacity of individuals and communities (including organisation and Governments) to address health promotion concerns. Finally, that the evaluations of projects

capture the complex nature of health promotion initiatives and their long-term impact.

2.4 Conclusions

The debate surrounding whether the paradigm is appropriate for the subject being evaluated will always be an issue of contention and debate between those that prefer one way of evaluating to another. The main point is that PARS should be evaluated in a way that can add to the body of knowledge and be used to improve the delivery and impact of these schemes (Glasgow et al 1999; Oakley 2001; Riddoch et al 1998; Springett 2001). If we are to understand PARS more fully, evaluations need to use different methodologies, driven by intervention theory rather than commissioners (Blamey & Mutrie 2004), in order to answer questions pertinent to them and move away from providing the same limited evidence as previous evaluations (Oakley 2001).

Further, policy makers and managers have criticised researchers, as the evidence rarely speaks for itself, and the lack of discussion by researchers and reviewers of the practical and policy implications of their evaluations and evidence summaries (Rychetnik & Wise 2004). Partly perhaps as researchers and academics are reserved in reporting their findings and tend not to be familiar with policy, they are also criticised when they do make recommendations due to the difficulty of applying their findings practically (Rychetnik & Wise 2004; Smith & Bird 2004)

Another reason for the lack of evidence based practice in the development of existing programmes and PARS, may be due to the reluctance of project managers to change a service they are familiar with and that clients like, even if evidence to support it is poor (Weiss 1998). Interviews with Australian policy makers and health promotion managers revealed that interventions are not always selected due to the evidence for their effectiveness, but instead, to meet local health priorities and opportunities (Rychetnik & Wise 2004). This highlights that despite the push by the Government for evidence-based practice, that evidence does not always influence the judgements on which programmes will be implemented.

Evaluations of PARS have used RCT designs, but many have been criticised as not being true RCTs. The lack of evaluation and small number of studies that meet stringent inclusion criteria of reviews is not surprising considering the difficulty in conducting these studies, fundamentally because there is no true way to blind the intervention (PARS) from the researcher or participants. Interestingly, these studies in the UK have been of both established schemes and interventions similar to PARS (e.g. Harland, White, Drinkwater et al 1999; Harrison, Roberts & Elton 2005b; Lamb, Barlett, Ashley et al 2002; Stevens, Hillsdon, Thorogood et al 1998; Taylor, Doust & Webborn 1998). Findings from PARS studies adopting these designs have not, to date, provided significant relationships between PARS and changes to physical activity levels. Many have been criticised for using crude measures and having a lack of rigorous design, which has led to an increasing call for improved evaluation design. Plus, there has been a move by researchers to ask different questions about PARS, such as the impact of the area and deprivation scores upon PARS attendance (Gidlow 2006).

Fundamentally, 'If change and modification of the programme, to improve the quality of delivery and health outcomes is not achieved, in essence the evaluation will have failed' (Dugdill et al 2005: p. 193) . In order to assess the public health impact of physical activity referral schemes and investigate the influence of the referral processes upon participants' attendance levels, as has been undertaken by the current evaluation, researchers need to look at alternative designs and frameworks for evaluation that better suit this phenomenon, rather than those of clinical drug trial as has been recently recommended.

Using a prospective cohort study in the current evaluation to explore the determinants of PARS processes upon attendance provides a different perspective from most previous PARS evaluations, adding to the evidence currently available. This socio-ecological method also provides ecological validity as it evaluates an established PARS without controlling variables, so the evidence is translatable to other schemes. The following review of UK PARS highlights the lack of evidence in relation to scheme processes and participant characteristics.

3.1 Overview of PARS in the UK

This chapter provides an overview of the previous studies examining outcomes of physical activity referral schemes (PARSs) in relation to scheme processes and participant characteristics. Illustrating where this research sits within the current literature, provides the background of the ProActive PARS and an explanation of the scheme processes, which are central to this research.

3.1.1 Physiological outcomes

In order to assess the effectiveness of schemes and meet public health research targets, researchers have mainly focussed on measuring biomedical outcomes to directly assess the impact of the PARS upon participants' health (For example, Dugdill et al 2005; Harland et al 1999; Lord & Green 1995; Martin & Woolf-May 1999; Taylor 1996; Taylor et al 1998). Generally, measures from PARS examined physiological improvements that were in agreement with previous large cohort studies (Paffenberger et al 1986; Taylor 1996; Taylor et al 1998). These have included; assessment of body mass, blood pressure and resting heart rate (Dugdill et al 2005), physical measurements and exercise test outcomes (Harland et al 1999; Taylor 1996), and general health and health satisfaction questionnaires (Hammond, Brodie & Bundred 1997; Lord & Green 1995; Munro 1997; Taylor 1996) and the previous non-peer reviewed evaluation of ProActive (Grant, Harrison & Coe 1999) took both physiological and psychological health measures. These outcomes were taken at different intervals usually to assess the impact of the scheme physical activity sessions and resulting physical activity levels on physiological measures and perceived health status at: baseline, post intervention (12 weeks) and at 1 year (Harland et al 1999). Taylor et al., (1998) (For full report see, Taylor 1996) assessed at baseline and three intervals up to 6 months following intervention (at 16, 27 and 37 weeks); Hammond et al (1997) followed baseline assessment with 6 and 12 weeks follow up; Lord and Green (1995) took measures at first consultation and after 10 weeks and 6 months; Grant et al (1999) assessed pre and post physical activity programme and at 6 months. These staged measures allowed comparison of changes from baseline, which

were often used to replace the data of a control group. These measures have been consistently measured in PARS despite the unequivocal link between physical activity and physiological improvements in health (United States Department of Health and Human Services 1996).

The biomedical influence that public health asserts onto PARS (Section 2.2) is not surprising considering that they were originally set up to meet CHD targets set by the Government at the time (Department of Health 1999c). This influence is also evident in some qualitative research, as participants reported their experiences in relation to physiological symptoms and benefits (Hardcastle & Taylor 2001; Singh 1997; Stathi, McKenna & Fox 2003). For example, when Stathi et al (2003) asked participants about their physical and mental improvements, participants discussed physiological functioning, symptoms, and the benefits of physical activity in relation to their medical conditions. Participants' focus towards physiological outcomes in these studies indicates both a bias in the researcher's questions, the influence of their referring health professional's reason for referring them, and in turn, PARS association with primary care (Department of Health/DCMS 2004b).

The on-going reporting of physiological outcomes, may be due to the following reasons: firstly, in order to meet the call by the Department of Health for the evaluations of PARSs to report outcomes that can be related to public health targets (Department of Health 2001a); secondly, it could be argued that scheme evaluations have data collection methods decided prior to collection, often years before the data is analysed and reported; thirdly, professionals involved in these schemes prefer to assess in this way and are reluctant not to use all the available data; finally, this biomedical focus of PARSs reproduces similar studies and findings, preventing researchers looking at different aspects of PARSs, such as scheme processes as predictors of attendance, being investigated by this study.

31.2. Attendance outcomes

Evaluations and studies of PARS have mainly used self reported measures of participants' physical activity levels (e.g. Day & Nettleton 2001; Harland et al

1999; Lord & Green 1995; Stevens et al 1998). These have ranged from 7 day recall of physical activity levels taken before, during and after attending a PARS (Dugdill et al 2005; Harrison et al 2005b); 4 week recall of physical activity levels (Stevens et al 1998) or relied on participants' perspective of how their physical activity levels changed over a 3 to 5 year period (Day & Nettleton 2001). Self reported measures were mainly used because they were easier to gather than attendance from scheme records (e.g. Jackson, Bell, Smith et al 1998; Taylor et al 1998), which requires the co-operation of scheme staff and data collection to be integrated into scheme processes.

Levels of uptake or initial attendance by participants varies between studies and the figures reported often did not include participants that dropped out. For instance, Taylor et al (1998) report a high uptake of physical activity sessions (86%) but this figure is considerably reduced (49%) when including those that dropped out before randomisation. Uptake of PARS was either defined as participants' point of attendance of physical activity with a leisure provider (Munro 1997; Taylor et al 1998) or attendance at their initial consultation (Dugdill & Graham 2005; Lord & Green 1995; Stevens et al 1998), and varied from 35 to 60% for attendance of one or more physical activity sessions and 23 to 49% for attendance of initial consultation. Some of these studies measured the level of uptake from point of referral, which translated to researchers invitations to attend the scheme, some of which were signed by their GP (Stevens et al 1998; Taylor 1996). Not until recently have the determinants of access been investigated in established PARSs in practice rather than pseudo schemes set up for the purposes of research. Uptake of physical activity was reported in preliminary findings for Scheme B (of two schemes discussed by the authors), which measured those that did not call to make an initial appointment after being referred by their GP (Dugdill et al 2005). The full dataset was used later to explore the determinants of uptake (Harrison et al 2005a).

Completion definitions also differ depending on the use of assessment or attendance measures. In the case of assessment measures, many studies defined completion as attendance of the final assessment (Dugdill & Graham 2005; Hammond et al 1997; Lord & Green 1995; Stevens et al 1998), which is

problematic as researchers are assuming that participants that attended final assessments also went to the majority of their physical activity sessions. Both scheme assessment attendance measures reported between 18% to 46% of participants attended their last assessment session (Dugdill et al 2005; Lord & Green 1995; Stevens et al 1998). Taylor et al., (1998) on the other hand, were able to differentiate participants by their scheme attendance levels, placing them into one of two categories; high attenders participated in 15 or more sessions out of a possible 20, while low attenders participated in less than 15 sessions. 28% were high attenders (17% including those that dropped out before randomisation). In contrast, preliminary findings of Munro et al (1997) reported attendance in relation to the mean number (25) of sessions attended by participants over a 10-month period. No further detail is given due to the brevity of the report. There is a dearth of studies that measured attendance consistently from point of referral to discharge, or made comparisons between participants in different attendance groups (e.g. Day & Nettleton 2001; Dugdill & Graham 2005; Dugdill et al 2005; Hammond et al 1997; Harland et al 1999; Harrison et al 2005a; Jackson et al 1998; Lord & Green 1995; Martin & Woolf-May 1999; Munro 1997). This highlights the need for data collection to be a part of scheme processes so that data is collected from point of referral rather than point of attendance. Study designs need to be rigorous enough to allow the exploration of significant relationships and interpretation, allowing comparison of studies and characteristics in relation to uptake, drop out and level of attendance.

A few studies recorded reasons for participants' non-attendance. Lord and Green (1995) attributed the high number of participants dropping out within 10 weeks (82%) to: illness, injury, sessions stopping during holidays and problems with the sessions, suggesting that participants were dependent exercisers and questioning the quality of the exercise sessions. Munro et al (1997) visited non-participants at home with the intention of encouraging them to attend, the following reasons emerged: illness or disability (arthritis, anxiety/depression); emotional barriers (fear of falling, lack of confidence); self perception (too old to exercise) and practical issues (transport, too busy and carer). Dugdill et al (2005) reported one of the first studies to pinpoint where participants dropped out from a PARS. They found that the level of non-attendance to scheme A (of

two schemes discussed) after the initial appointment prior to starting the programme was 43% (Dugdill et al 2005).

Participants' main referral reason was explored as a determinant of PARS access by Harrison et al (2005a), who found that those with a main referral reason of mental health, cardiovascular disease, fitness or overweight were significantly associated with attending the first appointment compared to those in the 'none specified' category and the overall referral reason of sedentary lifestyle (Harrison et al 2005a). This is the only study apart from the current study to investigate the influence of referral reason on attendance.

3.1.3 Scheme processes

To date, very few UK based studies have attempted to gain an in-depth understanding of the perceptions towards physical activity and the referral process (Riddoch et al 1998). Scheme processes can be defined as the components that make up PARS and constitute the participant's journey through the scheme from initial point of referral to the point of formal discharge from the scheme. For example, process components include health professional and leisure provider.

Scheme processes will be discussed in greater detail in the next section, looking at the properties and dimensions of the different characteristics that make up referral processes. These include health professionals and leisure providers with regard to the influence they have upon the participants' journey through the scheme.

Influence of referring health professionals

General practitioners (GPs) are a dominant characteristic of PARS. The status of GPs as the principle referring health professional may be attributed to the history of PARS, being originally called 'exercise on prescription' (Hammond et al 1997; Jackson et al 1998; Lord & Green 1995; Martin & Woolf-May 1999) and 'GP referral schemes' (Day 2003; Jackson et al 1998; Singh 1997; Taylor et al 1998). In contrast schemes where health professionals do not refer

participants have a much lower uptake of physical activity (Harland et al 1999; Stevens et al 1998). According to a number of researchers, health professionals not only influence their patients but also provide support (McDowell, McKenna & Naylor 1997; McKenna, Naylor & McDowell 1998; Stathi et al 2003).

The endorsement of physical activity by a GP appears to be an influential factor in both uptake and attendance (Taylor 2003). Despite this, some studies failed to investigate this key PARS process. For example, researchers sent invitations from participants' GPs to visit an exercise development officer (Stevens et al 1998; Taylor 1996) or health officer rather than a direct referral by a health professional (Harrison et al 2005a). Older people hold their GPs in high esteem (Hardcastle & Taylor 2001; Singh 1997; Stathi et al 2003) and reported that they felt obliged to attend because of their GPs' recommendation (Hardcastle & Taylor 2001), illustrating the importance of evaluating established PARS, as the influence of GPs cannot be replicated by researcher recruitment protocols.

Previous studies have questioned whether general practitioners are the most effective referring health professionals (Taylor 2003), since patient attendance after referral by practice nurses was better than general practitioners (attendance rates of 45% and 32% respectively) (Graham, Dugdill & Cable 2005). Due to the larger number of GPs compared to practice nurses, it is unlikely that nurses will become the dominant referring health professionals (Department of Health 2002b). The reason that GPs are less effective referrers than practice nurses may be because GPs primary focus is the patient's reason for consulting followed by relevant health promotion priorities. Further, physical activity promotion may not be the primary concern for GPs, as some GPs feel that lifestyle change is the responsibility of the patient (Graham et al 2005). Nurses may be more effective than GPs, since they tend to provide support to patients in taking up healthy behaviours and follow up on their progress (Department of Health 1999c). This may be due to practice nurses having a greater remit to promote health as they (80.1%) were more likely to have promoted physical activity in the previous six months than GPs (53.2%) (McKenna et al 1998). Physical activity is increasingly promoted by a growing

variety of health professionals (Department of Health/DCMS 2004a). Registered Dietitians reported routinely promoting physical activity to their patients (McKenna, Henderson & Baic 2004), with a third of Registered Dietitians reporting that they referred patients to PARSs (McKenna et al 2004). However, like practice nurses, this still represents a smaller number of health professionals in comparison to the total number of GPs.

Health professionals do not consistently promote physical activity to all their patients. Lack of time was revealed as a barrier for both GPs and practice nurses in physical activity promotion (McKenna et al 1998). Referring health professionals' level of physical activity was also found to be related to referral behaviour; those that were physically active were four times more likely to have referred participants, perhaps because they were less affected by perceived barriers of promoting physical activity, than those who were not (McDowell et al 1997; McKenna et al 1998). Physically active health professionals were also more likely to follow up on the progress of participants and provide more support (McDowell et al 1997).

Another influencing factor for the opportunistic promotion of disease prevention was considered to be that of the health professional's interpretation of the evidence for using interventions (Getz, Sigurdsson & Hetlevik 2003). Smith et al., (1996) found that both GPs and practice nurses were able to indicate a number of psychosocial and physiological benefits, but neither were able to link the benefits of physical activity to the primary prevention of cardiovascular disease (Smith, Gould, See Tai et al 1996). Further, evidence interpreted within professional publications can also be misleading. The conclusions of the Newcastle exercise project (Harland et al 1999) that there was limited evidence for the effectiveness of PARS, and that PCTs should not waste funds on them was a headline (Harland et al 1999), and was published in the British Medical Journal (with a principle readership of GPs¹), the context of the findings that were based on a study of a 'pseudo' PARS that did not contain many of the key facets of a traditional referral scheme was only brought to light in the following ensuing correspondence.

¹ <http://bmj.bmjournals.com/aboutsite/index.shtml>

The ethical implications of offering opportunistic health promotion are discussed by Getz et al (2003). They suggest that disease prevention interventions suggested by the GP, which are not associated with the patient's reason for their visit, should not be discussed. Their argument is that health promotion not only prevents patient autonomy, but it may also distract from discussing other key factors that influence health during the consultation. Such as destructive relationships and socio-economic factors (Getz et al 2003); indicating the impact that health promotion targets may have upon some facets of patient care.

The haphazard selection of patients for referral by health professionals has also been criticised due to its unsystematic nature, as it is only reaching a small percentage of the practice list. The use of practice records to identify patients may help to identify those with the most to gain (Graham et al 2005; Taylor 2003). Taylor et al (1996) reported that ten per cent of the Hailsham population had experienced the referral scheme over the previous six years, resulting in increased awareness of the benefits of being physically active (Taylor 1996). In contrast, a large review study reported the population impact of PARS as only one per cent (Riddoch et al 1998). However, there is a move away from 'GP referral' with changes in both schemes and public health policy over the past decade. There has been an increasing move towards disease prevention via health promotion (Department of Health 1992 1999c). Initially emphasis was placed on the delivery of health promotion by practice nurses and health visitors (Department of Health 1999c). Health promotion has developed into the responsibility of all health professionals, in both delivery and partnership working with health related professionals in other environments to co-deliver health related activity, for example, physical activity referral and falls prevention schemes (Crone et al 2004; Department of Health/DCMS 2004b).

Both referring health professionals and participants have cited the criteria for exclusion of participants that are considered high risk for PARS as a barrier. Many studies have reported exclusion criteria that excludes participants with conditions that are normally included in schemes, for example hypertension and diabetes (Harland et al 1999; Lord & Green 1995; Taylor 1996). These exclusion criteria resulted in referring health professionals reporting feeling

frustrated (Graham et al 2005; Smith et al 1996). Interviews of health professionals (16 GPs, 4 practice managers, 2 practice nurses, and 1 receptionist), from 10 out of 14 eligible referring practices, highlighted that the referral criteria (Family Health Services Authority guidelines) used by the scheme were perceived as restrictive and considered to be overcautious (Graham et al 2005). One general practitioner reported that they had ceased referring and others were unable to refer patients, due to the referral criteria (Graham et al 2005). This indicated that health professionals tended to use the PARS as an intervention or treatment (like a prescription) for those diagnosed with conditions, rather than promoting PARS for the prevention of conditions for those with risk factors for longer term lifestyle diseases, e.g., high blood pressure, weight gain, physical inactivity and raised blood glucose.

The National Quality Assurance Framework (NQAF) guidelines outlined that it is solely the referring health professional who has the responsibility to risk stratify the patients they refer (Department of Health 2001a). Lord and Green (1995) provided a good example of the inclusion guidelines used by health professionals which included: those that the GP considered would benefit, those aged between 18 to 65 years, those who were sedentary and at risk of coronary heart disease with no contraindications to exercise, while the exclusion criteria included; severe chronic obstructive artery disease, angina pectoris and other atherosclerotic disease, unstable hypertension, history of MI and insulin dependent diabetics (Lord & Green 1995). However, there is evidence for improvements mediated by physical activity for many of the conditions excluded, which are characteristic referral reasons listed by the NQAF for PARS (Department of Health 2001a). Much of the exclusion criteria used by these studies were most probably restricted by the environment and level of qualifications of exercise professionals.

Many GPs cited medico-legal responsibility as a further barrier to referring (Graham et al 2005; Smith et al 1996), as referral guidelines were often vague or stated that practitioners must accept full clinical responsibility for the patients they referred (Smith et al 1996). The NQAF (Department of Health 2001a) outlined guidelines for the roles of both health and exercise professionals. Importantly, the NQAF rejected the idea that health professionals 'prescribe'

exercise; their role became one of 'recommending' appropriate physical activity, where the exercise professionals would take responsibility for the delivery and administration of a suitable programme of exercise (Department of Health 2001a). The document goes further by outlining the responsibility of health professionals to provide pertinent information for the exercise professional to risk stratify participants (Department of Health 2001a).

Increasingly, health promotion and access to physical activity will come from a variety of health professionals and individuals. The Game Plan (DCMS Strategy Unit. 2002) moved away from biomedical models of physical activity promotion to interventions on incorporating physical activity into daily living. The Government called for the introduction of health trainers (see Section 1.2 for more information) to act as a conduit and target communities that need health promotion the most, by advising those that want to improve their health. According to the Government, health trainers will provide individual information and advice such as the physical activity opportunities in the area that fit in with lifestyles and support individuals throughout this process (Department of Health/DCMS 2004b). By 2007 health trainers will be available throughout the country. They will target population groups that do not see health professionals regularly, and importantly, they will provide a more targeted approach to health promotion and help to tackle health inequalities (Department of Health/DCMS 2004a).

Influence of physical activity environment

Public health policy also recognised the importance of the environment in which participants' programmes are undertaken and the vital role of exercise professionals (Department of Health 2001a). The characteristics of successful schemes were identified in a review by Gidlow et al (2005) and included; tailoring the intervention to the individual, enthusiastic staff, non-facility based lifestyle activity and the promotion of moderate intensity physical activity.

The scheme processes were found to influence the attendance of older women attending a PARS, whose experiences were explored in a qualitative study by Hardcastle and Taylor (2001). Similar studies have also looked at what

participants experiences tell us about PARS processes (e.g. Crone et al 2005c; Singh 1997; Stathi et al 2003) and in a community walking scheme (Ashley & Bartlett 2001). These studies explored the complexity of physical activity behaviour through the experiences of participants, and indicate how PARS processes and participant characteristics may affect attendance. Psychological and social components were found to be important for PARS participants, in their enjoyment, connecting meaning and their subsequent continued physical activity (Crone et al 2005c; Hardcastle & Taylor 2001; Stathi et al 2003). The following six psychosocial dimensions emerged from Hardcastle and Taylor's (1996) interviews: informal networks and processes of referral; perceptions of control; accountability and referral process; sources of beliefs regarding exercise; life-stages and support networks; social support in the gym setting; and ageism and social norms (Hardcastle & Taylor 2001). Hardcastle and Taylor's (2001) study provides an insight into the influence and experiences of PARS processes upon participants' attendance levels. Similarly, Singh (1997) employed a semi-structured interviewing approach with thirteen participants (30-64 years) of a PARS. In this study participants' answers may point to the bias of the interview schedule, as participants mainly discussed their experiences in the context of physical improvements and attendance issues. A more recent study by Crone et al., (2005) which investigated the mental health experiences of PARS found that the meaning individuals attached to their experience of physical activity was important. Although the purpose of the Crone et al (2005c) study was to investigate the physical activity and mental health relationship, the outcome pertinent to this research is the importance participants placed on the social and physical context of the PARSs that they participated in which are partly concerned with scheme processes. For example, they found that the fitness instructor was important in attaching meaning to the experiences that people had whilst exercising, by moving attention towards the psycho-social aspects of the scheme which enabled participants to become comfortable with their own bodies and accept themselves as exercisers (Crone et al 2005c).

Participants' experiences of PARS go further to explain the importance of the exercise environment. Hardcastle and Taylor (1998) reported the importance of psychosocial aspects of a scheme for older women, particularly in terms of

their continual attendance of the scheme. Social support, social engagement and social inclusion from other participants facilitated by the exercise professional have also been found to be important (Crone et al 2005c). Social support also assisted participants in overcoming barriers for being physically active. The exercise professional was reported as crucial in supporting participants new to the scheme by providing psychological support to overcome their barriers (Stathi et al 2003). The importance of the exercise professionals' awareness of creating social networks and attaching meaning to physical activity are both illustrated and highlighted in the psychosocial experiences reported by participants as important for their continuing physical activity (Crone et al 2005c; Hardcastle & Taylor 2001; Stathi et al 2003). This further highlights the importance of evaluating existing schemes that retain ecological validity as they have these processes in place.

Leadership style of exercise professionals has been examined by several studies (Bray, Millen, Eidsness et al 2005; McAuley, Talbot & Martinez 1999; Turner, Rejeski & Brawley 1997; Winninger 2002 2003). Turner et al (1997), manipulated leadership style to separate the impact of the social environment created by the exercise professional from that mediated by physical activity. Participants were assigned to the same physical activity (ballet) session with either an enriched (with constructive feedback and individual encouragement) or bland (negative encouragement, non specific feedback) leadership style. Unsurprisingly, participants found the socially enriched leadership style significantly more enjoyable than the bland form of leadership (Turner et al 1997).

Both leadership style (motivationally and socially enriched compared to bland) and the physical activity session (restricted compared to varied) were manipulated, in order to assess if the style of delivery by the instructor was more important than the physical activity session (step aerobics) itself (Bray et al 2005). To prevent any contamination due to previous experience, participants were young women with no experience of step aerobics classes. Enjoyment was highest in the group that experienced the motivationally and socially enriched style (e.g., praise, reward and encouragement) combined with the varied physical activity session, while participants in the bland style and restricted physical activity intervention had the lowest level of enjoyment (Bray

et al 2005). This highlights the individual importance of enriched leadership style and varied physical activity programming for enjoyment, particularly as one dimension can compensate for the other. Similarly, the participants in Turner et al's (1997) study reported enjoying the socially bland session, due to the level and variety of skills required by the physical activity session (ballet). This illustrates the influence that both leadership style and physical activity programming can have upon participants' enjoyment and in turn their likelihood of continuing to attend.

In conclusion, a variety and choice of physical activity options promote enjoyment and move goals to reasons for continuing to be active from initial health related goals (Wankel 1993).

The physical activity approach is also important to participants with some reporting that they prefer lifestyle physical activity as it has more meaning for them (Stathi et al 2003). Supervised physical activity sessions and the ongoing assessment of progress is recommended by the NHS, as they are both characteristics associated with referral schemes (Department of Health 2001a). These provide a framework for the supportive environment that has been reported by participants as being crucial for facilitating an enjoyable experience (Crone et al 2005c; Hardcastle & Taylor 2001; Stathi et al 2003). In agreement, leisure provider components that were linked to positive experiences of schemes identified by Gidlow et al (2005) included, regular and long term follow up of participants, supervised sessions, provision of exercise equipment and reduced price policy. In a review the variety of physical activity was highlighted as important as it allows participants an element of choice of type of physical activity that appeals to them (Health Education Authority 1995).

3.1.4 Evidence of scheme effectiveness

The need to demonstrate that PARS are an effective intervention to be promoted by public health has meant that scheme evaluations and studies have been dominated by public health values. Paradoxically, this has resulted in a lack of evidence for the effectiveness of these schemes to meet public health targets (e.g. Biddle et al 1994; Fox et al 1997; Gidlow et al 2005; Hillsdon, Foster, Naidoo et al 2004; Hillsdon & Thorogood 1996; Hillsdon,

Thorogood & Foster 1999). However, the number of schemes throughout the UK continues to grow in response to their apparent popularity within practice. The Government published guidelines for PARS (Department of Health 2001a) to address quality assurance issues, and in turn, aid the continuing development and evaluation of schemes. The continuing popularity of PARS, despite the lack of evidence, is perhaps because they are perceived to provide an easy way to meet public health targets, are liked by project managers and the small proportion of the population that successfully use them (Dugdill et al 2005).

Despite the problems of providing the type of evidence that public health wanted, Taylor et al., (1996) undertook a randomised controlled trial, and found there was a greater reduction in body fat and blood pressure in participants that attended more often. The positive health benefits reported by schemes and participants are criticised because they are often not significant, due to low numbers of participants in studies and the research methods used. Also, there is criticism of the lack of impact PARS have upon the communities they serve (Riddoch et al 1998; Smith & Bird 2004).

Gidlow et al (2005) examined the success of PARS in relation to participants' level of attendance, by examining both 'real life' PARS evaluations and PARS style interventions in their review. They were unable to identify which participants were most likely to attend or exit schemes. This was due to poor recording of data and reporting of data solely in relation to participant characteristics. However, in a high proportion of all reviewed studies', participants exited the scheme before planned discharge (Gidlow et al 2005). This finding highlights the need to investigate the influence of PARS processes upon attendance to understand their influences and ideally reduce the number of participants exiting the scheme prematurely.

There has been a call for PARS evaluations to explore the impact of scheme processes upon attendance (Riddoch et al 1998), coupled with discourse regarding appropriate techniques for evaluating PARS (Dugdill et al 2005; Riddoch et al 1998), and a call for a greater focus by researchers on evaluating 'real life' PARS to address the implications of ecological validity (Gidlow et al

2005) (see Sections 2.2 and 2.3). Some researchers are using different evaluation techniques to explore alternative perspectives such as scheme processes, which have been effective in other areas of physical activity research and public health. This is reflected by the growing exploration of participants experiences (e.g. Crone et al 2005c; Hardcastle & Taylor 2001; Stathi et al 2003), and the recent use of a prospective longitudinal study by Harrison et al (2005a) and Gidlow (2006) to explore the determinants attendance

The previous evaluation of ProActive (Grant et al 1999) was mainly focussed on the impact of scheme attendance upon participants' physical activity levels six months after discharge from the scheme. As the evaluation was undertaken by the PCT, physical and perceived health was assessed to determine the impact of the scheme upon health. Grant et al (1999) recognised the significance of the ecological validity of their evaluation in comparison to the controlled studies at the time. The main findings were that participants that had completed their programme significantly increased their level of physical activity, compared to baseline, six months later and had significant improvements in some aspects of perceived health. Grant et al (1999) also compared participants' characteristics in relation to physical activity outcomes. They reported that unemployed or sedentary participants were more likely to take up referral, while those with mental health conditions were less likely to. Non-smokers, older participants and those with musculoskeletal referral reasons were more likely to complete compared to those that did not. However this evaluation was unpublished and focussed on a relatively small number of participants (n=610) that were referred to eight leisure providers (of approximately 18 in total).

3.1.5 Summary

Despite the call for evaluations to look at PARS processes (Department of Health 2001a; Riddoch et al 1998), there is a prevailing lack of evidence and a dearth of studies that ask questions regarding the influence of scheme processes on outcomes, particularly in relation to where they exit the scheme. Until recently, the only studies that had explored the impact of scheme processes used qualitative methodologies.

3.2 ProActive: a countywide physical activity referral scheme

This section aims to set out the background and history of the Somerset PARS in order to set the context for the current study. It provides a full explanation of the scheme processes that were in place at the time of the evaluation. These processes were quality assured by a co-ordinated multi-agency group (Somerset Physical Activity Group (SPAG)) that has been in place for the past decade and provides strategic support for the scheme. This group supported ProActive Management Service (PMS), allowing the delivery of the quality assurance mechanisms at an operational level (Grant et al 1999).

3.2.1 Scheme background

The ProActive PARS was originally set up by the SPAG in 1994, to address the needs of individuals with coronary heart disease risk factors (Grant et al 1999). SPAG is a multi-agency alliance, which was established in 1993, and operates at both a strategic and policymaking level. SPAG has the aim of providing a co-ordinated approach to physical activity promotion at a countywide and local level, and was linked to the Somerset Specialist Health Promotion Service (SSHPS) (Crone et al 2004; Somerset Physical Activity Group 2002).

SPAG is composed of professionals from a wide range of organisations interested in promoting physical activity and health throughout the county. At the time of this study this group included council officers (five district councils²), the local medical committee (health professionals), charities (e.g., Age Concern and British Heart Foundation), private leisure providers, Somerset Education Services, Sport England – South West, officers and managers from Taunton Deane PCT (representing the Primary Care Trusts³) and ProActive Management Service. This partnership working has been recognised nationally and cited as an example of good practice (Biddle et al 2000).

² Mendip, Sedgemoor, Taunton Deane, South Somerset and West Somerset.

³ PCTs: Somerset Coast, Mendip, Taunton Deane, South Somerset.

3.2.2 Conclusions of previous evaluation

The main conclusion of the previous ProActive scheme evaluation (Grant et al 1999) was that the scheme successfully addresses activity levels within Somerset. Two thirds (67%) of participants took up referral (measured from point of referral) of which over half (51%) completed (attending 80% or more exercise sessions). However, this should be treated with some caution as physical activity was measured using self-reported questionnaires (Grant et al 1999).

3.2.3 Exercise science support service

A unique characteristic of the scheme was the support service known as the Exercise Science Advisory Service (ESAS), which was established in 1996. (Crone et al 2004; Grant et al 1999). ESAS provided continuing professional development and support for recognised leisure providers and those working towards recognition in the form of workshops, newsletters and support for scheme staff. It also had a role in promoting the scheme to local health professionals to initiate and maintain the referral of patients. This was a particularly important service considering the high level of staff turnover experienced in the leisure industry (Crone et al 2004).

In April 2000 three accredited BASES sport and exercise scientists were successful in tendering for the contract and ESAS was renamed ProActive Management Service (PMS). Two project workers were employed (exercise scientists) over the duration of the contract. PMS had a greater management focus, in combination with the exercise science support service. This multi-disciplinary team provided PMS outlined in Figure 3.1.

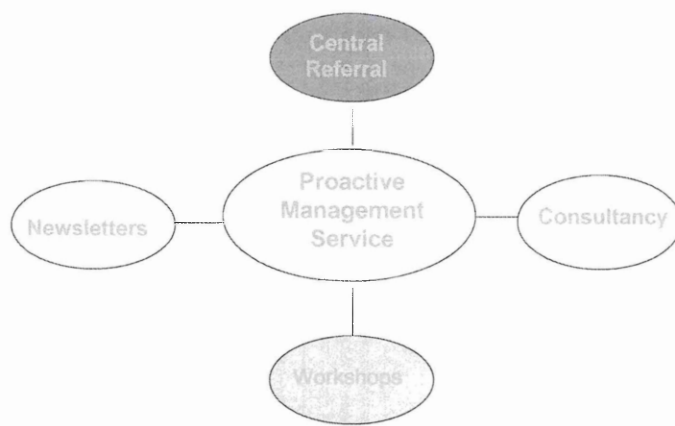


Figure 3.1. Support and management provided by ProActive Management Service

This support and management consisted specifically of:

- Central Referral Mechanism (CRM) provided by the Project Workers (to contact all clients, liaise between patients, health professionals and leisure providers, risk stratifying all clients referred onto the scheme).
- Recording and monitoring of referred participants using an Access database.
- Supporting leisure providers' applications for scheme recognition and continuing professional development for leisure providers (workshops and newsletters).
- Producing quarterly reports of the scheme for SPAG.

3.2.4 Leisure provider recognition process

The consultancy service that was provided to leisure providers was mainly to assist them in gaining and maintaining SPAG recognition. This support was largely interdisciplinary in nature and drew from exercise science disciplines, physiology and psychology, as well as health promotion, leisure and project management, health policy and administration (Crone et al 2004).

Leisure providers wishing to receive referred clients had to be recognised by SPAG. This involved the leisure providers presenting the evidence of how their scheme would meet the SPAG recognition criteria. By completing a portfolio of

competencies (Appendix 2) covering all areas of the scheme from organisation to pertinent case studies. The portfolio covered the following areas:

- Administration
- Staffing
- Facilities
- Physical Activity Plan
- Health Promotion
- Links with Referring Health Professionals
- Renewal of Recognition
- Phase IV cardiac rehabilitation (optional)

Once the completed portfolio was received by SPAG it was followed up by an assessment visit from a multidisciplinary evaluation team, consisting of the following professionals: General Practitioner, Leisure Centre Manager, Exercise Scientist and Health Promotion Specialist. Throughout the recognition process the leisure provider was supported by PMS, which involved feedback on the portfolio prior to submission, and a mock assessment to prepare the leisure providers for the SPAG assessment.

The SPAG assessment initially involved a tour of the facilities, inspection of first aid facilities and equipment cleaning schedules, followed by interviews with the co-ordinator and scheme staff, to ensure that they were clear on their roles and exercise programmes for the specialist populations referred onto the scheme. The multidisciplinary assessment team assessed the scheme in their specialist areas and provided feedback; an assessment report was written and presented to the full SPAG committee for a decision on whether to grant recognition or not.

Provision of workshops for the recognised leisure providers ensured that the exercise professionals working on ProActive had continuing professional development to improve their knowledge and competencies relating to special populations so that they met the guidelines of the NQAF (Department of Health 2001a) and attendance was a requirement for re-recognition. It could be argued that this continuing professional development was important for promoting staff satisfaction and retention, due to the high levels of staff

turnover reported within this group of professionals (fitness instructors). For more information about the quality assurance provided by PMS refer to Crone et al (2004).

The services provided by PMS will be explained in more detail in relation to participants' journey through scheme processes in Chapter 4 (see Figure 4.1).

3.2.5 Referring health professional

A wide variety of health professionals referred their patients onto the scheme. The previous scheme evaluation reported referrals coming from 33 general practices and 4 hospitals. Most referrals were by GPs (60%) followed by practice nurses or health visitors (36%) and other health professional (4%) who were mainly physiotherapists or osteopaths (Grant et al 1999).

The NQAF for PARS (Department of Health 2001a) provides guidelines for the most common model of PARS. Such a model is linked to primary care and relies on health professionals referring participants onto schemes for supervised physical activity. Guidelines for health professionals recognise doctors, nurses and therapists as referring health professionals, and sets out competencies that they need before referring (Department of Health 2001a).

Health professionals were represented within SPAG. These representatives provided an insight into the remit and needs of each group of health professionals. In turn their involvement and input into scheme processes and development ensured a level of ownership of the scheme and confidence in the standards of service, which was crucial for the referral of patients. For example, the Cardiac Nurses' contribution was fundamental in developing the evidence criteria for leisure providers to gain Phase IV cardiac rehabilitation scheme recognition, not only for quality guidelines, but also for the development of referral pathways for participants from Phase III cardiac rehabilitation.

3.2.6 Central referral mechanism

A previous evaluation of ProActive recommended the introduction of a central referral mechanism (CRM) (Grant et al 1999). This was to improve countywide co-ordination and maximise uptake of the referral scheme as the audit revealed that 33% of participants did not take up referral (e.g., attend their initial assessment). An Accredited British Association Sport and Exercise Sciences (BASES) exercise scientist fulfilled the role, as the project worker, gathering information relating to participants and their journey through the scheme. The CRM formed a crucial communication link between health professionals, referred participants and leisure providers (Crone et al 2004).

3.2.7 Accessing the scheme

Participants accessed the ProActive scheme through their health professional. Usually this was suggested by the health professional during a routine appointment as either an intervention to limit or prevent symptoms from escalating, or as prevention due to the presence of risk factors that would lead to a condition. The patient may, due to their prior knowledge, request to be referred to the scheme. The scheme encouraged the referral of individuals that were quite sedentary with specific health problems that would benefit from being introduced to structured and supported physical activity.

The referring health professional completed a ProActive referral form that had categories to ensure that the information provided enabled the CRM to risk stratify and contact the participant (See Appendix 5). This included the patient's name, contact details, referral reasons (up to four), relevant medical conditions, medication, additional information (e.g., activity to be avoided) and most recent blood pressure reading. In agreement with guidelines (Department of Health 2001a) if the referring health professional did not include enough information, or more information was required following contact with the participant, the form was either returned to health professional with a letter requesting further information or they were contacted by telephone.

The ProActive Scheme inclusion and exclusion criteria were developed by SPAG over the past decade. This has been in accordance with public health policy and guidelines from the following organisations: British Heart Foundation (British Heart Foundation 2001), American College of Sports Medicine guidelines for special populations (ACSM 1997), British Hypertension Society Guidelines (Williams, Poulter, Brown et al 2004), NQAF PARS (Department of Health 2001a), British Association of Cardiac Rehabilitation (British Association of Cardiac Rehabilitation 2000). The guidelines for PARS helped to risk stratify participants by ensuring that pertinent information was passed on to ProActive by the referring health professionals (Department of Health 2001a).

Initially, when the CRM started in April 2000 (the period this evaluation starts from), the inclusion criteria guided referring health professionals to the conditions with evidence for the effectiveness of physical activity as an intervention. This included: angina pectoris, arthritis, asthma, diabetes mellitus, hypertension, mild mental health conditions (anxiety, stress and mild depression), musculoskeletal conditions, obesity and osteoporosis. The criteria, however, excluded the following: peripheral vascular disease, systolic blood pressure ≥ 180 mmHg, diastolic blood pressure ≥ 95 mmHg, unstable angina, unstable diabetes and post myocardial infarction without phase III cardiac rehabilitation, because SPAG considered the exercise professionals qualifications at the time to be unsuitable to supervise these individuals. These conditions were also considered too high risk for community based physical activity as they were categorised as high risk by the ACSM guidelines (ACSM 1997). Over the period of the evaluation this changed and peripheral vascular disease was included and the guidelines for blood pressure changed; this was in line with the Government PARS guidelines of qualifications appropriate to work with client groups (Department of Health 2001a) and local negotiation, improved staff knowledge and qualifications such as the BACR phase IV exercise instructor. The contraindications for referral for physical activity were sent to all referring health professionals and in November 2005 they were as follows:

Cardiac

- Unstable angina
- Uncontrolled cardiac arrhythmias causing symptoms or haemodynamic compromise
- Severe symptomatic aortic stenosis
- Uncontrolled symptomatic heart failure
- Acute pulmonary embolus
- Acute myocarditis or pericarditis
- Suspected or known dissecting aneurysm
- Tachycardia of >100 bpm at rest
- *Uncontrolled* Hypertension, i.e. Resting Systolic > 180mmHg & / or Diastolic >100mmHg

Metabolic

- *Uncontrolled* metabolic disease (e.g. diabetes, thyrotoxicosis, or myxoedema)

Muscular

- Neuromuscular, musculoskeletal, or rheumatoid disorders that are exacerbated by exercise

Other

- Acute infections/illness/fever
Uncontrolled mental health condition

Further risk stratification was undertaken when the CRM initially contacted the participant in order to check for contraindications. For example, if a participant had angina they were questioned to check whether it was stable (e.g., angina symptoms at rest or at night may indicate unstable angina). All information that indicated a contraindication for exercise was relayed to the referring health professional and the participant was removed from the scheme until their symptoms had been resolved.

DoH recommendations for PARSs have linked exercise professional level of expertise with participant risk and activity modification (Department of Health

2001a). These are grouped according to population risk level to enable schemes to devise suitable inclusion criteria so that participants are matched to the exercise professional's knowledge. The introduction of a Register of Exercise Professionals (REPs) to coincide with the NQAF for PARS (Department of Health 2001a) ensured that exercise professionals' level of qualifications could be identified and matched to population risk, ranging from level two (medium risk populations) to level three (high risk populations).

Due to the medical conditions of participants routinely referred to PARS by health professionals, the NQAF called for all instructors to be level three registered by 2004 (Department of Health 2001a). However, the high level of qualification required for PARS staff may be unrealistic, considering the renowned disparate salary levels in relation to qualifications of this group.

Despite the production of the inclusion and exclusion guidelines for referring health professionals, some participants were still referred onto the scheme with contraindications to exercise. The CRM maintained scheme safety by removing these individuals (as outlined earlier). The reasons for removal were investigated by Johnston, Warwick, De Ste Croix et al (2004). Those that did not meet the inclusion criteria were put into the medical inappropriate referral category; they found that men with cardiac referral reasons were more likely to be removed due to medical reasons.

The previous evaluation of ProActive undertaken by Grant et al (1999) focussed on physical activity levels following discharge from the scheme. Analysis concentrated on differences in relation to participant characteristics. The current study focuses on capturing the complexity of scheme processes and how they relate to participant attendance levels. While the previous study undertook analysis that looked for differences in attendance according to participant characteristics, the current study will also undertake analysis of the influence of scheme processes upon the likelihood of participants ending up in the different outcome groups. As discussed in Chapter 2 earlier, despite acknowledging the importance of being an evaluation of a real life scheme, the previous study design did not capture the complexity of the scheme and retain the ecological validity of the intervention.

The central referral mechanism (CRM) used in the ProActive PARS was unique when it was introduced in 2000 because health professionals referred patients to the scheme as a whole rather than a specific leisure provider (See Figure 3.2). Additional quality assurance was provided by the effective removal (by the CRM) of those with contraindications to exercise and with non-medical reasons for not wishing to participate (Johnston et al 2004). This effectively reduced the time wasted by leisure providers that would have previously received these individuals for appointments and also ensured that the scheme ran safely.

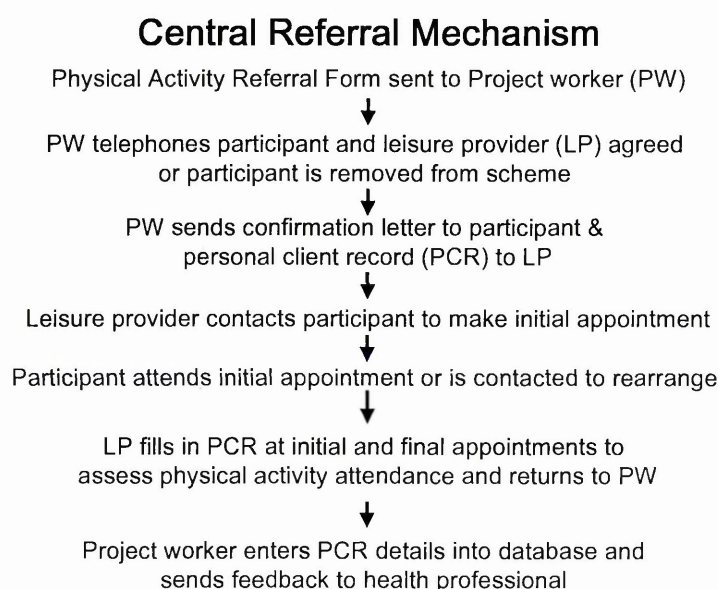


Figure 3.2. Flow diagram of Central Referral Mechanism

The project worker was crucial for a client centred approach outlined in the NQAF (Department of Health 2001a) because this role involved interdisciplinary working, requiring the application of knowledge from an exercise science perspective, physiological aspects of disease, the implications of medication and exercise, the psychological variants of behaviour change and the psychosocial implications of commencing physical activity (Crone et al 2004).

The project worker's main role was to risk stratify, contact and track the progress of the participants through the scheme. Health professionals forwarded all referral forms to Taunton Deane PCT, where a paper copy was

taken and filed, before being sent on to the project worker (Appendix 5). The forms were then inputted into the Access database as illustrated by Figure 3.3.

Figure 3.3. Example of participants' details held on the database

The project worker contacted each referred participant to discuss their physical activity options using brief negotiation with the participant (Crone et al 2004). This discussion included their goals, current physical activity levels and both physical activity and leisure provider preferences. Participants were also further risk stratified to check details contained within their referral form, for example, whether their symptoms were stable, or if they had any concerns about exercising, or any other relevant conditions. At this stage the participant was either; referred to their choice of leisure provider or removed, due to a contraindicated medical condition (medical removal), or if they no longer wished to take up physical activity with the scheme (other removal). Pertinent details from this conversation (e.g., preferred mode of physical activity, reasons for wanting to be active, fears and barriers) were recorded (Figure 3.3) and sent as a 'personal client record' (PCR) (Appendix 6) to the leisure provider, thus providing an accurate and detailed communication link between the participant and leisure provider.

The project worker discussed with the referring health professional any concerns regarding participants with contraindications for exercise. Depending upon the discussion, the participant would usually be removed from the

scheme and if appropriate referred to an alternative provider (such as one with expertise in cardiac rehabilitation exercise) or referred again by their health professional when their symptoms were resolved or controlled. When staff changes occurred to schemes, so that they no longer met the recognition criteria mentioned earlier, the CRM ensured that participants were offered alternative recognised leisure providers.

3.2.8 Physical activity opportunities

SPAG quality assured leisure providers (LP) all provided fully supervised sessions. These sessions were mainly leisure centre based akin to the most common models of PARS, where participants are referred to a leisure centre (Department of Health 2001a). All providers were encouraged to offer a variety of activities, the amount they offered depended on their resources and size. A leisure centre tended to have more facilities than individual exercise instructors (usually operating from village halls). The following are examples of the sessions offered: gym programmes, yoga, back care, aqua-aerobics, tai-chi, falls prevention, cardiac rehabilitation, swimming, health walks, pilates, golf and circuit based sessions. This was to provide participants, many with little experience of physical activity, with a wide variety of physical activity opportunities.

The leisure providers also encouraged participants to increase their habitual physical activity (e.g., walking to work, taking the stairs). This was to enable participants to be more independently active and avoid dependency on the scheme. Intensity of physical activity was monitored throughout the physical activity sessions so that participants could appreciate the benefits of moderate intensity activity. Those that were new to physical activity were reassured by this and were able to self-monitor within a safe environment.

Some schemes involved social events, which provided the opportunity for participants to interact with each other. The important role that the exercise professional plays in creating a friendly social environment for participants has been identified as an important element for programmes by the NQAF (Department of Health 2001a) and previous research supports the importance

of exercise professionals in facilitating an environment that encourages social interaction (Crone et al 2005c).

After the leisure provider received the participant's information from the CRM; the leisure provider booked the participant for an initial assessment. This allowed the client to meet with the scheme staff and look around the facility. The client's goals, preferences and information regarding medication and conditions were taken into consideration when putting together an individual physical activity plan. This aimed to have both supervised and lifestyle physical activity.

The period of exercise sessions offered by schemes was between six to twelve weeks (holidays and illnesses are not included). If the leisure provider did not see the participant for two weeks they would contact them to check if the scheme was satisfactory. This was in line with guideline nine of the NQAF (Department of Health 2001a). All schemes had a mid programme appointment (Guideline 10) (Department of Health 2001a), recommended by a previous study (Lord & Green 1995). The mid programme assessment enabled the participant and leisure provider to discuss aims and feedback on progress, modify the physical activity plan and work towards their goals.

The workshops, newsletter and consultancy provided by the multidisciplinary professionals that made up PMS were crucial to the maintenance and continuing development of the quality service delivered by recognised leisure providers on the scheme.

3.2.9 Summary

ProActive Management Service and SPAG were essential for the delivery and continuing development of the ProActive PARS. This chapter has discussed the literature surrounding PARS and explained the ProActive scheme processes, how they were quality assured and the stakeholders involved.

The evidence surrounding PARS has still not provided adequate evidence regarding the influence of referral processes upon participants. The ProActive

scheme has quality assured processes, which have been commended for good practice (Biddle et al 2000). Evaluating these scheme processes provides a unique insight into PARS and the identification of which aspects of the scheme are most and least successful, providing scheme stakeholders with practical ways to improve scheme operation and ensure that scheme processes have a positive impact upon participants.

This chapter describes the context of the current study and justifies the research methods and approaches used. This approach differs from the traditional methods used to evaluate PARS, in order to examine the influence of scheme processes with ecological validity, using quasi-experimental methods.

4.1 Rationale for methods

As previously discussed in Chapter 3, there is growing debate concerning the approaches to evaluating physical activity referral schemes (Dugdill et al 2005; National Institute for Health and Clinical Excellence 2006b). Evaluations of PARS to date do not fully explain the referral processes and lack ecological validity due to these studies using evaluation designs that do not embrace the complex nature of PARS (Nutbeam 1998; Victora et al 2004; World Health Organisation 1998). This is mainly due to the association of PARSs with primary health care, which has resulted in commissioners and fund holders influencing the evidence that is available. Through a lack of understanding of the phenomenon being examined and their inflexibility over study design (e.g. National Institute for Health and Clinical Excellence 2006b).

Importantly, when this evaluation was conceived no PARS evaluation had investigated the processes of PARS using a prospective cohort design. The merits of this method are recognised by Sallis and Owen (1999), in particular the ecological validity of the prospective cohort methods they were using to identify the complex determinants of physical activity (Sallis et al 1992; Sallis et al 1990; Sallis et al 1997). A large population dataset allows researchers to explore the determinants of the outcome, whereas, previous studies of physical activity referral schemes had small datasets where explaining variables were artificially fixed and outcomes were measured (Harland et al 1999; Harrison et al 2005b; Swinburn, Walter, Arroll et al 1998; Taylor et al 1998). The use of population data in the current study and two other recent studies (Gidlow 2006; Harrison et al 2005a), marks the beginning of an important paradigm shift in the way that physical activity referral schemes are evaluated, which maintains their

ecological validity and importantly allows full exploration of the influences of the complex processes of these schemes.

4.1.1. Scheme Outline

ProActive is a physical activity referral scheme that involves health professionals (HP) referring patients from primary care to attend six to twelve weeks of supervised physical activity sessions with leisure providers. Briefly, participants' outcome categories were devised in relation to their point of exit from the scheme to reflect their exposure to the PARS processes (See Figure 4.1).

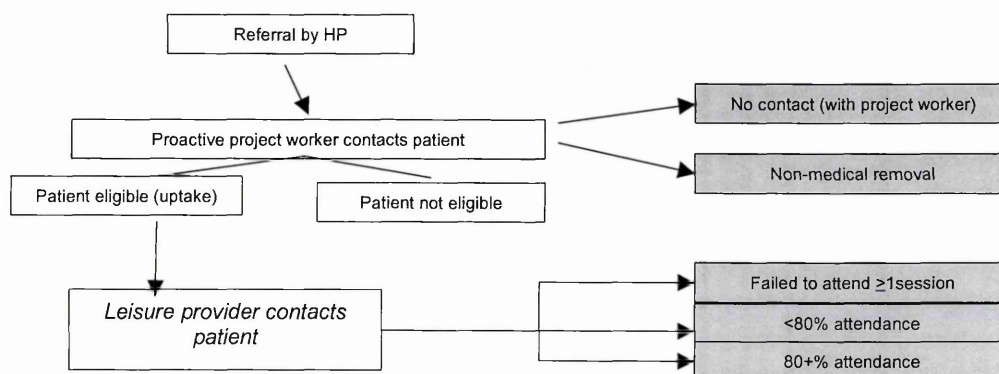


Figure 4.1. Flow diagram of participants' journey through the scheme and their subsequent outcome categories (grey).

4.1.2. Main research question

Do certain facets of the referral processes³ and participant demographics⁴ relate to scheme attendance levels?¹

4.1.3. Selection of variables

Variables were selected in order to answer the research question as fully as possible, by examining the level of association of scheme processes and participant characteristics with their progress through the scheme.

³ For example, referring health professional, leisure provider

⁴ For example, age, gender and referral reason

Currently, there are a lack of PARS evaluations that use objective attendance data for the outcome (dependent) variable (Biddle et al 1994). The use of an attendance category (by the current study) as the outcome variable, includes data that was objectively collected by the project worker (author) and leisure providers, which offers more objective outcome variable (Gidlow et al 2005). This enables an explanation of the extent to which scheme processes and participant characteristics are associated with participants' attendance levels.

The attendance outcome variable was constructed in four ways to match the natural points that participants' exited the scheme (see Figure 4.1 and Section 3.2.7). Each of these four staged outcomes were:

- 'contact' with the central referral mechanism
- 'allocation to a leisure provider'
- 'attendance' of one session or more with a leisure provider
- 'completion' of 80% or more of participants' planned physical activity sessions with a leisure provider

All four outcome categories were constructed as dichotomous outcome variables. This was in order to clearly differentiate and compare participants in the outcome categories (Figure 4.1) with each other (e.g. 'contact' and 'no contact').

The explaining (independent) variables of referring health professional and leisure provider were selected as they reflected scheme processes and were objectively identified. Further, they were selected as they both represented participants' key experiences of the scheme (Ashley & Bartlett 2001; Crone et al 2005c; Hardcastle & Taylor 2001; Singh 1997; Stathi et al 2003). Participants' characteristics (age, gender and referral reason) were also included as independent variables, in order to explore the influence of other key variables upon participants' progress through the scheme. Further, there is likely to be an interaction between scheme processes and participant characteristics. The explaining variables therefore include:

- referring health professionals
- leisure provider management

- participants' characteristics

4.1.4. Appropriate data analysis method

Due to the research questions, large number of participants and the type of data collected, logistic regression analysis was the most appropriate statistical tool to answer the research questions. This analysis method was selected because “logistic regression, allows the prediction of a discrete outcome, such as group membership, from a set of variables that may be continuous, discrete, dichotomous, or a mix” (Tabachnick & Fidell 1996: p. 575). Population researchers have used logistic regression to explore the determinants of physical activity outcomes for over a decade (Blair et al 1989; Sallis & Owen 1999).

In relation to this research logistic regression analysis allowed for the prediction of participants' level of progress through the scheme (outcome) from their individual characteristics and the scheme processes. Logistic regression was also chosen because it is flexible in its assumptions, as it does not need independent variables to be normally distributed, linearly related or have equal variance within each group (Altman 1994). However, it needs a large dataset, at least 50 participants within each independent variable, for the accurate prediction of outcomes, particularly when the dependent variable has many groups (Tabachnick & Fidell 1996). Because it is so flexible, it is becoming an overused method (Denton, Prus & Walters 2004) and researchers have to be sure that the method is appropriate for their study and research questions⁵.

Since the current study was exploring associations, the direct stepwise method, where all predictors are entered into the equation at the same time was used. Researchers consider it as the method of choice in the absence of an order of importance for each variable. Each variable is evaluated as if it is entered last. Stepwise procedures are useful in two contexts: purely predictive research and exploratory research (such as the current study). In purely predictive research,

⁵ The current study gained the opinions of two experts (Charlie Foster and Prof. Clare Morris) who were presented with the research questions, study design, explaining categories and outcome categories of the current study. They confirmed that logistic regression analysis was an appropriate method of analysis to use in this context.

there is no concern with causality, only with identifying a model, including a set of predictors, which provide accurate predictions of some phenomenon, such as attendance.

As mentioned earlier, each of the four staged attendance variables were expressed as dichotomous outcome variables, as this allowed the comparison of participants at each of the natural exit points of the scheme (see Figure 4.1). Further, a binary outcome also provides more commanding results, and aids the interpretation of the odds ratios that arise from logistic regression statistical analysis technique (Tabachnick & Fidell 1996).

4.1.5 Rationale for variable categorisation

Dependent variable

In answering the research question, participants were differentiated by their level of attendance (see Figure 4.1). For this purpose participants were grouped within the following four outcome categories.

- 'Contact' category relates to whether participants had contact with the CRM or not. This was used to compare those that had no contact with the CRM with those that did, to see if participant characteristics (gender and referral reason) and scheme processes (referring health professional) predicted participants' membership of the groups. This type of outcome variable is unique to this evaluation, since previous studies have only obtained data *after* participants' had made contact with the scheme.
- 'Allocation to a leisure provider' category relates to whether participants chose a leisure provider or decided not to continue with their referral during their conversation with the CRM (this category included 'no contact' and 'non-medical removal'). This allowed an investigation of the influence of explaining variables (gender, referral reason and referring health professional) on whether participants were allocated to a leisure provider or not.

- 'Attendance' category allowed the investigation of the influence of independent variables (gender, referral reason and referring health professional) on whether participants attended one or more sessions with a leisure provider compared with those participants that 'failed to attend' and subsequently experienced less of the scheme (this category also included 'no contact' and 'non-medical removal'). This is where most scheme evaluations start their data collection, however, many of these do not have data relating to participants that do not attend (For example, Day & Nettleton 2001; Harland et al 1999; Harrison et al 2005a; Lord & Green 1995; Taylor et al 1998).
- 'Completion' category allowed the investigation of the influence of the explaining variables (age, gender, referral reason, referring health professional and leisure provider) on whether participants completed 80% or more of their planned exercise sessions with a leisure provider or not (this category included those that attended 1% to 79% of their exercise sessions). This was in order to further differentiate participants by their level of scheme experience.

Independent variables

The independent variables were selected to represent the processes of referral and participants' characteristics.

Referral Reason

The current evaluation differentiated between participants by using the main referral reason given by their referring health professional. The main referral reason provided an objective explaining variable. In order to meet the criteria for logistic regression analysis, of fifty or more records in each category, these were re-organised into a smaller number of categories as follows:

- Cardiovascular disease
- Overweight and Obesity
- Diabetes
- Musculoskeletal health
- Psychological well-being and mental illness

- Unfit/sedentary
- Other (including cancer)

The challenge was finding categories that fit the physical activity, public health and policy context of this evaluation. In order to find these categories the following documents were explored: the International Classification of Disease (ICD) (World Health Organisation 2003a), the American College of Sports Medicine book of exercise management of chronic diseases (ACSM 1997), and the evidence for the conditions that are targeted with physical activity by the Department of Health (Department of Health 2004a).

The conditions targeted by public health, taken from the Chief Medical Officer's report (Department of Health 2004a) were chosen to provide category headings as they met both the physical activity, public health and policy criteria of this study. These categories are taken from the evidence of the impact of physical activity in relation to health, outlined in the report (Department of Health 2004a). These categories are presented in relation to the evidence for the effectiveness of physical activity as both an intervention and prevention, and relate to the National Service Frameworks published by the Government (Department of Health 2004a)

The sixty-five main referral reason categories were systematically assigned to the seven new categories assisted by International Classification of Disease (ICD) definitions (World Health Organisation 2003a). Colleagues provided systematic checking, to ensure that the referral reasons were correctly assigned to the seven new referral reason categories in relation to the context of this PARS evaluation, using the definitions outlined in the ICD (World Health Organisation 2003a) and Chief Medical Officer's report (Department of Health 2004a). For example, the cardiovascular disease category contained; cardiovascular disease, coronary heart disease, hypertension and angina (Appendix 4).

An 'other' category was created for all those referral reasons that did not meet the seven new categories. This also included data from the "cancer" category (N=3), due to the low number of participants in that group. Many previous

studies have not differentiated participants by referral reason, instead those that were undertaking quantitative analysis placed all the multiple referral reasons for each participant together in order to look at the overall frequencies (e.g. Grant et al 1999; Harland et al 1999; Taylor et al 1998). Those that differentiated referral reason were able to report differences in frequencies of attendance in relation to referral reason (Dugdill et al 2005; Lord & Green 1995) and a recent study used referral reason to predict access to PARS (Harrison et al 2005a). Harrison et al (2005a) referral reason categories were similar to the current study using; cardiovascular disease, musculoskeletal, mental health, overweight, fitness, respiratory and none specified.

Leisure provider

In order to differentiate between leisure providers and categorise them; programme length, activities offered and cost differences were explored. However, due to the way that the schemes had developed and changed over the three year period being examined, it was not possible to use these data to discriminate between the schemes. Therefore, for the purposes of this study the type of management authority that oversaw the leisure provider was used to categorise them as follows:

- 'Local Authority', related to schemes that were run or owned by local councils and therefore overseen by their officers. They have a remit to meet local physical activity targets.
- 'Local Education Authority (LEA)', related to schemes at centres linked to schools run by the LEA. Their primary mandate was to meet the needs of the school and they also have a remit to provide physical activity to the local community.
- 'Private', related to schemes in centres that were owned and run by private organisations. They have no remit to meet local public health targets.
- 'Individual', related to schemes that were run by individual fitness instructors, mainly from village halls in rural areas. These schemes were often set up to meet community needs and ranged from fitness to cardiac rehabilitation classes that contained both referred individuals and clients from the surrounding area.

It was felt that scheme management provided an insight into the type of scheme experienced by participants and to some extent participants' level of access. As schemes run in local authority centres tended to offer lower priced programmes to participants and be more flexible in the supervised session times they offered. Whereas, privately run schemes were more likely to be more expensive with restricted supervised session times and local education authority run centres although lower priced, tended to offer restricted session times due to the priority of use for the schools they were connected to.

To date, only two previous studies have classified leisure providers (Biddle et al 1994; Fox et al 1997). In their evaluation of 157 and 35 planned schemes in the United Kingdom, they categorised schemes as either practice managed or leisure centred managed. Since these studies, models of physical activity provision provided by PARS have received little attention over the past decade (Biddle et al 1994; Fox et al 1997).

Finally, during examination of the data for leisure provider categorisation, the West Somerset area scheme stood out as having a unique style of scheme management and referral processes in comparison to the other schemes throughout the county (Section 1.3, Figure 4.1). This was because referred participants did not go through the CRM, and therefore categorising and differentiating participants' progress through the scheme (outcomes) was not possible to the same extent as other participants. Further, West Somerset had many centres and individuals that were linked together, making leisure provider differentiation difficult. Therefore, all referrals from this area were removed from the dataset.

Health Professional

In order to highlight the variety of referring health professionals that use the scheme, categories were based on the most prolific referrers. This also ensured meaningful data analysis as those with lower numbers of referrals (less than fifty) were placed together in the 'other' category.

The Health Professional categories are as follows;

- 'General Practitioners',
- 'Practice Nurses',
- 'Physiotherapists',
- 'Other' referring health professionals (Section 4.2.5).

Most existing evaluations of PARS mention general practitioners and practice nurses. Studies investigating referring health professionals also tend to focus on these individuals (Graham et al 2005; McKenna et al 1998; McKenna & Vernon 2004; Naylor, Simmonds, Riddoch et al 1999; Smith et al 1996). One study of PARS mentions cardiac rehabilitation nurses, also illustrating the variety of referring health professionals (Dugdill et al 2005). To date, no other studies mention a wide variety of other health professionals involved in physical activity referral schemes.

Due to the lack of data currently available within the literature relating to the range of referring health professionals, the results of the current study will provide a greater insight into the effect that referring health professionals have on participants' progress through the scheme.

4.2 Methods

The methods undertaken in this study were in keeping with the research question and aimed to maintain the ecological validity of the countywide physical activity referral scheme being evaluated.

4.2.1 Participants and recruitment

Somerset population

The study took place in Somerset, a medium sized county with an area of 3450 square kilometres (Somerset Health Authority 2001) and a population of 498,093 (Office for National Statistics 2001a). Somerset is a rural county with many areas of outstanding natural beauty, comprising of market towns, farmland and national parks. This stretches from Frome in the northeast to Minehead in the southwest. There is a mixture of both affluent and deprived areas, with a large retired population mainly in West Somerset and in the Burnham area of Sedgemoor (Somerset Health Authority 2001). Over the past ten years the population has increased by seven per cent (Office for National Statistics 2001a).

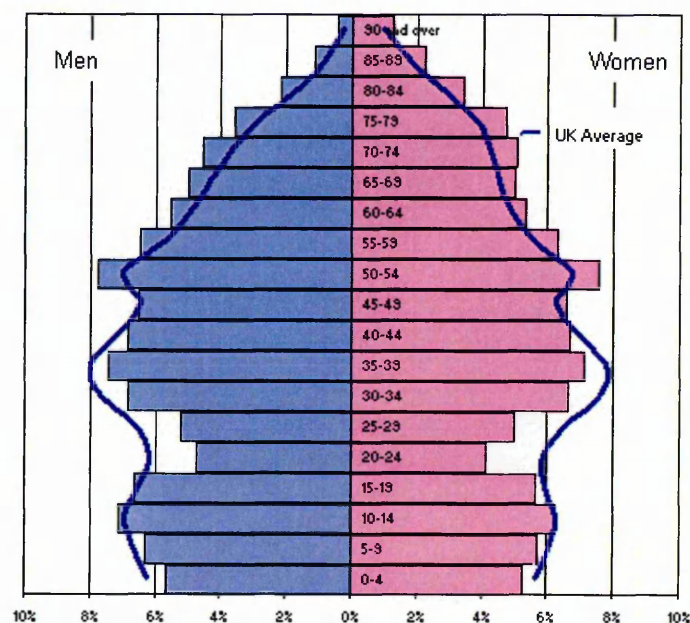


Figure 4.2. Somerset Population Age & Gender Structure 2001 (Office for National Statistics 2001a)

Figure 4.2 shows the distribution of the ages and genders of the Somerset population (Office for National Statistics 2001a), the line, which runs along the edge of the bars, is the United Kingdom population average. Somerset has a higher than average number of people aged over 50, and a lower than average number of people aged between 20 and 40. The largest single age band was that of people aged between 50 and 54 years. Further, there were more males than females under 25 years of age.

According to the 2001 Census the ethnic minority population, including white minority groups, of Somerset were very low despite having more than doubled over the last ten years from 1.3% to 2.7% (Office for National Statistics 2001a). The Somerset population consisted of 18% of people with long-term illness, health problems or disability (2001 Census, ONS).

Accessing the scheme

Participants were selected by their health professional during routine primary care appointments and some were self-selected as they initiated the referral. The referrer would normally recommend that the patient might benefit from becoming more physically active in a supportive environment. If the patient agreed the health professional completed a ProActive 'referral form' (Appendix 5 and Section 3.2.5) and passed this to the project worker (the author). Participants included in the study were both male and female; they were referred onto the ProActive Physical Activity Referral Scheme between 1 May 2000 until 2 May 2003 by health professionals from one hundred and fifty three general practices, hospitals and therapy centres throughout Somerset and some on the county border.

4.2.2. Study design

This study resides in the principles of applied research, as it is an evaluation of an established physical activity referral scheme, which constitutes a 'real-world' setting. Research such as this is valuable to practitioners and policy makers (Neuman, 2000). It is essential to use a study design that is sensitive in retaining the essence of the PARS, the population level PARS data and capture the true interaction of variables.

This is a prospective cohort study, since a population were studied as they progressed through the scheme, from referral (selection) by their health professional to their final assessment with the leisure provider. Data collection of exposure information (participant characteristics and scheme processes) was incorporated into the usual running of the scheme via the central referral mechanism (CRM), using a Microsoft ® Access 2000 (9.0.3821 SR-1) database to gather information and to track participants' progress through the scheme and their subsequent outcome group membership.

4.2.3. Ethical approval

This evaluation was approved by Taunton Deane PCT (Appendix 3) a routine audit of services within the contract granted to the University of Gloucestershire (and later moved to Sheffield Hallam University) to provide exercise science services to the PARS, through ProActive Management Service from 2000. In addition, the University of Gloucestershire research committee also approved this evaluation in 2003 (Appendix 3). Data collection was approved by Health Informatics Team, Taunton Deane PCT, as it was in accordance with the Data Protection Act 1984.

Ethical procedures were undertaken in the study to meet the following criteria:

- Data protection. All participants' were allocated a number. Names and addresses were removed from the data.
- Informed consent. At the point of referral by a health professional all participants gave their signed agreement for ProActive Management Service (PMS) to have their information for use for research purposes.
- Risk and harm assessment. Leisure providers' attained recognition and maintained scheme quality through continuing professional development and support from PMS. All participants were risk stratified by the CRM (project worker) to ensure they met inclusion criteria (see Chapter 3 for more information).

- Confidentiality and anonymity. All identifying information was removed or changed to ensure anonymity of participants.

4.2.4 Data extraction and cleaning

The project worker (author), as part of the central referral mechanism (CRM), entered the participants' referral records and details into a Microsoft ® Access 2000 (9.0.3821 SR-1) database throughout the period of this study (see Chapter 3). Data from 1st May 2000 until 2nd May 2003 were extracted for analysis (3762 records).

The data remained contained in Microsoft Access 2000 (9.0.3821 SR-1) for the initial data cleaning, the data was examined for errors and missing data as follows:

- i. The correction of typographical errors and entries that did not match the drop-down categories contained within the database such as 'referrer position' and 'referral reason' (see Figure 3.3).
- ii. The categories relating to 'referral reason' were amended part way through the period of study to simplify the dropdown boxes, which had many similar selection categories (see Appendix 4). A look up table was devised in Microsoft ® Excel 2000 spreadsheet (version, 9.0.3821 SR-1) to amend these 378 erroneous and repetitive categories to the new format that contained 69 categories (Appendix 4). All corrections were agreed to be consistent by PMS and Taunton Deane PCT.
- iii. Paper records of participant referral forms (Personal Client Record, PCR) (Appendix 6) were used to check records that were incomplete or incorrect due to data entry mistakes. Most paper records that were checked were also incomplete.
- iv. Letters were sent to leisure providers requesting further information where paper (PCR) forms were also incomplete. This returned some information, much of which still remained incomplete.

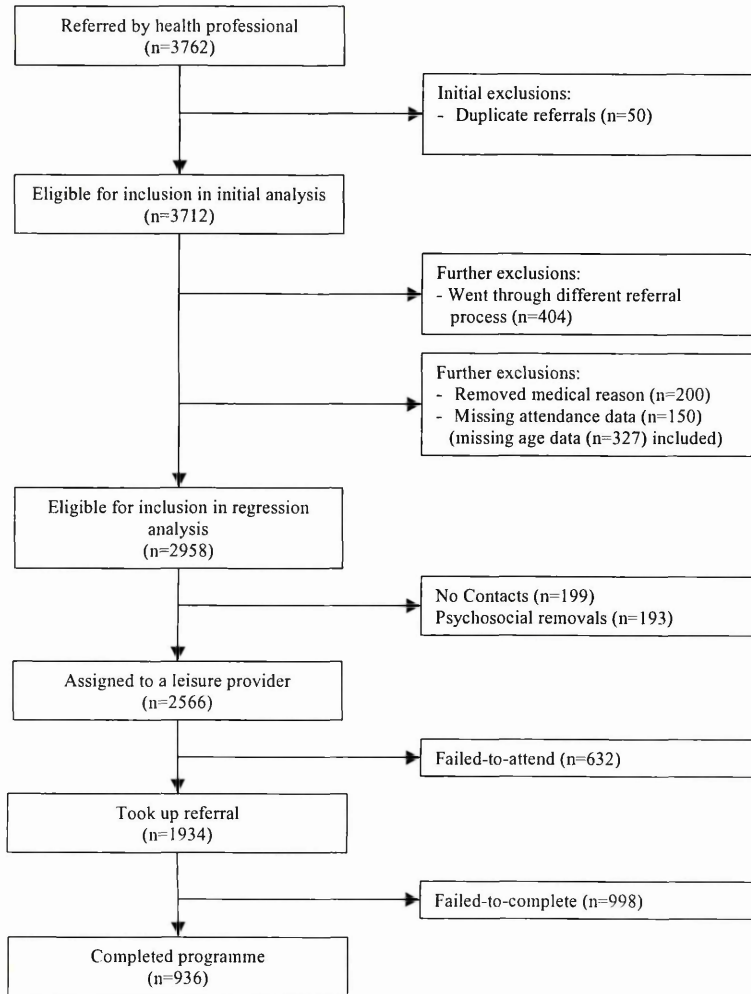
- v. The Health Informatics Team (Taunton Deane PCT) provided additional age data to reduce the amount of 'missing data'. They did this by matching the participant details with those on their database of the Somerset population; this added a considerable amount of age data.
- vi. Participants categorised as removed from the scheme by the CRM due to medical reasons were removed from the dataset, as they had no choice in their removal from the scheme.
- vii. Participants categorised as removed from the scheme by the CRM due to duplicate referral forms were removed from the dataset.
- viii. Further examination of the data during categorisation resulted in the removal of all West Somerset data. This was due to the confounding effect that data from this area would have upon all the outcome categories (Section 4.1.5).

The deadline for completion of this phase of data cleaning was set as 1st October 2004; all incomplete data after this date were then classified as 'missing'.

The following relevant data (see Figure 3.3 and Figure 4.1) to the research question were then extracted from the database to a Microsoft Excel 2000 spreadsheet (version, 9.0.3821 SR-1):

- I. Client identification number (anonymous)
- II. Age
- III. Gender
- IV. Initial referral reason
- V. Referring health professional
- VI. Reason for removal
- VII. Leisure provider
- VIII. Attendance of pre-assessment: true or false
- IX. Attendance of post-assessment: true or false
- X. Number of sessions attended
- XI. Number of sessions planning to attend

Data was then exported to Statistical Package for Social Sciences (SPSS) (version 12.0.1 for Windows) for further categorisation of the process and attendance variables (Figure 4.1) and data analysis.



4.3 Cohort profile

4.2.5 Categorisation of data

Dependent variable

It was important that reliable and objective outcome measures regarding participants' progress (level of attendance) through the scheme were used in order to be able to determine the relationship with scheme processes and participant characteristics (see Section 4.1.3).

The problems associated with using self-reported outcome data, in particular when trying to measure physical activity, has been well documented (Gidlow et

al 2005; Riddoch et al 1998). Therefore, having objective and reliable outcome measures for participants' progress through the scheme were very important. These measures were objective, as they were taken from records of attendance kept by leisure providers', which were transferred onto personal client records when participants completed their sessions. These were then inputted into the database by the project worker (author). Self reported levels of physical activity were not used.

The outcome categories of particular interest to this study are defined in Table 4.2. These were derived from the categories extracted from the database which, as can be seen in Figure 4.1, were mainly self explanatory. The eighteen removal reason categories were coded into two categories, this was in order to differentiate between those that had no contact with the CRM, and those that had contact with the CRM and had some level of choice (non-medical reasons).

- 'No contact' (no contact),
- 'Non-medical' removal (financial, worries about safety, not interested, transport problems, too busy, not convenient, not at ease, class too early/late, feels embarrassed, already active, family ties, work commitments).

Table 4.2. Participant attendance categories

Category	Definition
No contact	Had no contact with the project worker (CRM)
Non-medical removal	Chose not to proceed with referral during conversation with project worker.
Leisure provider allocated	Allocated to a leisure provider during contact with CRM.
Non-attender	Did not attend any exercise sessions with the leisure providers.
Attender	Attended one session or more with the leisure provider.
Non-completer	Referred to leisure provider – attended <80% of planned exercise session with leisure provider.
Completer	Referred to leisure provider – attended \geq 80% of planned exercise sessions with leisure provider.

The dependent (outcome) variables shown in Table 4.2 and Figure 4.1 were organised into four models containing binary outcome variables, which mapped participants' progress through the scheme (Section 4.1.3).

Independent variables

Scheme processes were clustered into the following categories. One sub-category from each category was selected as a reference value (as indicated) in order to make comparison for logistic regression analysis:

Referral reason

Due to the need for meaningful data analysis, referral reason was re-organised into a smaller number of categories. Each category contained at least fifty records in order to meet the criteria for logistic regression. Suitable approaches for categorising were explored looking at the disciplines of physical activity, public health and policy associated with the context of this evaluation (Section 4.1.5).

Initial referral reason was categorised as follows:

- Cardiovascular disease (reference category)
- Overweight and Obesity
- Diabetes
- Musculoskeletal health
- Psychological well-being and mental illness
- Other

These categories were taken from the evidence of the impact of physical activity in relation to health, which is strongly supported in the Chief Medical Officer's report (Department of Health 2004a). Due to the small number contained in the cancer category it was merged into the 'other' category (Section 4.1.5).

Referring health professionals

Referring health professionals were pragmatically categorised according to the proportion of records in each category (see Section 4.1.5). In order to meet the criteria for data analysis of fifty records in each category an 'other' category was created, as follows:

- General Practitioners (reference category)
- Practice Nurses

- Physiotherapists
- Other (referring health professionals)

The 'other' category contains: dieticians, psychiatrists, nurse specialists, cardiac nurses, smoking cessation officers and healthy lifestyle co-ordinators.

Leisure provider

Leisure providers were categorised to differentiate between them by the management of schemes (see Section 4.1.5) as follows:

- Local Authority (reference category)
- Local Education Authority (LEA)
- Private
- Individual

Age

Age was categorised into ten year age bands for the purposes of meaningful descriptive analysis and left as continuous data for the logistic regression analysis. Due to missing data, age was only used in the logistic regression analysis of 'completion' outcome category.

Gender

Gender was transformed into binary dichotomous categories. Men were selected as the reference value.

4.2.6 Data analysis

Descriptive analysis of data

The frequencies of all categories were used to give, as much as possible, a full overview of the diversity of the dataset. Due to the basic tenet of logistic regression for the discovery of theories (Tabachnick & Fidell 1996), it was felt that it would not be appropriate to undertake any descriptive analysis that involved a comparison of variables, as logistic regression analysis uses all explaining (independent) variables as a predictor of discrete outcomes (dependent variable).

Statistical Package for Social Sciences (SPSS) (version 12.0.1 for Microsoft Windows) was used for descriptive analysis. Tables were produced using Microsoft Excel 2000 (version, 9.0.3821 SR-1) by exporting the dataset back after categorisation in SPSS (Section 5.1).

Inferential analysis of data

Logistic regression was selected, because it was able to compare participants according to their progress through the referral scheme, and be flexible in analysing a mixture of data types (dichotomous, category and continuous data) (Section 4.1.4).

Logistic regression predicts the probability that an independent variable is equal to 1. Further, the logistic regression equation does not directly predict the probability that the independent variable is equal to 1. It predicts the log odds that a dependent variable will have an independent variable equal to 1. The odds of an event is defined as the ratio of the probability that an event occurs to the probability that it does not.

Logistic regression analysis equation is expressed as follows:

$$\text{Odds} = \frac{P}{1 - P} = \frac{\text{probability of presence of characteristic}}{\text{probability of absence of characteristic}}$$

And

$$\log(\text{odds}) = \text{logit}(P) = \ln \left[\frac{P}{1 - P} \right]$$

Research question: In what ways do certain facets of the referral process (e.g. referring health professional, leisure provider, central referral mechanism) and patient demographics relate to scheme attendance levels?

The following models were used to answer the research question (Section 4.2.5 and 4.1.3). They each used binary outcomes; these compared the outcome group membership of participants and were derived from the outcome categories defined in Table 4.2. and Figure 4.1):

Model 1 Contact category

- 'No contact' contains participants that had no contact with the project worker (Central Referral Mechanism).
- 'Contact' includes all participants that the project worker spoke to. This includes participants categorised as; non-medical removal, non-attender and attender.

Model 2 Leisure provider allocation

- 'Not allocated to a leisure provider', contained those from; no-contact and non-medical removal.
- 'Allocated to a leisure provider', contained; attenders and non-attenders

Model 3 Attendance category

- 'Non-attender' includes; those referred to a leisure provider that did not attend and contained the following categories; no-contact, non-medical removal and non-attender.
- 'Attender' includes all those referred to a leisure provider, which attended one session or more and contained all those from the 'attender' category.

Model 4 Completion category

- 'Non-completers' are those that completed less than 80% (1-79%) of their planned exercise sessions with the leisure provider.
- 'Completers' are those that completed more than 80% ($\geq 80\%$) of their planned exercise sessions with the leisure provider.

The odds ratios of the independent variables (participants' characteristics and the scheme processes) predicting the binary outcomes of each model were explored using forward Wald stepwise binary logistic regression analysis. This method specifies how the independent variables are entered into the analysis. Each variable category was tested based on the significance of the score statistic and the removal of a variable is based on the probability of the Wald statistic. Independent variables that significantly predicted the odds of participants' outcome membership remained in the final step equation. Reference values were selected in line with physical activity and public health policy (general practitioner, cardiovascular disease, men and local authority

leisure provider) (Section 4.2.5). These provided a comparison value for each category and were the first value of each category of the independent variables. These results were interpreted using *Applied logistic regression analysis* (Menard 1995), and are presented and discussed in the following chapters.

5.1 Results

This chapter describes the characteristics of the cohort that agreed to be referred onto the scheme by their health professionals. The results of each of the four logistic regression models, present determinants that relate to participants exit or progress through each phase of the scheme.

5.1.1. Descriptive Results

Data was collected over a three-year period from 1st May 2000 until 2nd May 2003. Approximately 800 health professionals who were attached to 153 surgeries and hospitals, listed within the ProActive database, made a total of 3762 referrals to the ProActive Physical Activity Referral Scheme (PARS). After data cleaning (Section 4.2.4, Figure 4.3) 2958 participants were included in the data analysis, of which the majority were women (62.3%, N=1842). Age ranged from 9 to 89 years, the mean age of participants was 50.3 years (SD 14.4); the mean age for men was 49.7 years (SD 15.4) and for women 50.7 years (SD 14.8).

Table 5.1. Age and gender distribution of participants.

10 year age bands	Male % (Number)	Female % (Number)	Total % (Number)
0-9 years		0.06 (1)	0.04 (1)
10-19 years	2.3 (23)	2.1 (35)	2.2 (58)
20-29 years	5.2 (51)	6.7 (111)	6.2 (162)
30-39 years	14.7 (145)	17.4 (286)	16.4 (431)
40-49 years	20.5 (203)	18.5 (304)	19.3 (507)
50-59 years	24.4 (242)	28.8 (473)	27.2 (715)
60-69 years	22.4 (222)	18.6 (305)	20.0 (527)
70-79 years	10.0 (99)	7.0 (114)	8.1 (213)
80-89 years	0.5 (5)	0.7 (12)	0.7 (17)
Grand Total	100 (990)	100 (1641)	100 (2631)

*Missing age data = 327 (11.1%)

As shown in Table 5.1, the majority of participants were in the 30 to 69 age groups (83%); the highest proportion of which fell within the 50 to 59 age band (27.2%) with the smallest proportion at either extreme of age bands of 0 to 9 years (0.04%) and 80 to 89 years (0.7%). Both men and women had similar age distributions, however, there were proportionally more women (28.8%) in

the 50 to 59 year category than men (24.4%) and also proportionally more women (17.4%) than men (14.7%) in the 30 to 39 year category. While in comparison there were proportionally more men than women in both the 40 to 49 year (20.5% and 18.5% respectively) and 60 to 69 year categories (22.4% and 18.6% respectively).

Nearly a third of all participants' initial referral reason (see Table X2) was overweight or obesity (30.3%, N=896), over a quarter were referred for musculoskeletal reasons (26.3%, N=777) and 16% (N=472) were referred for cardiovascular disease. Further, cardiovascular disease (32.0%, N=151), and unfit/sedentary (21.3%, N=45) were most commonly a referral reason in the 60 to 69 year age band. In contrast, overweight/obesity (24.7%, N=221), diabetes (31.7%, N=45), musculoskeletal (23.0%, N=179) and other (22.5%, N=68) were most commonly a referral reason in the 50 to 59 year age band. The 'other' initial referral reason group included the following conditions and diseases; cancer, respiratory, Parkinson's, stroke, crohn's, head injury, high cholesterol, multiple sclerosis, neuralgia, motor neurone, peripheral vascular, rehabilitation (stroke or chemical dependency) and smoking cessation. Those with an initial referral reason of mental health were most commonly younger and aged between 30 to 39 years (21.5%, N=34) or 40 to 49 years (20.3%, N=32).

Table 5.2. Initial referral reason by age categories

Initial referral reason	Age categories in years (number)										% Total
	% 0-9	% 10-19	% 20-29	% 30-39	% 40-49	% 50-59	% 60-69	% 70-79	% 80-89	% Missing	
Cardiovascular Disease			0.4 (2)	4.2 (20)	9.7 (46)	28.6 (135)	32.0 (151)	12.5 (59)	1.7 (8)	10.8 (51)	16.0 (472)
Overweight/Obesity		1.8 (16)	5.0 (45)	18.4 (165)	18.6 (167)	24.7 (221)	15.0 (134)	4.2 (38)	0.1 (1)	12.2 (109)	30.3 (896)
Diabetes				4.9 (7)	16.9 (24)	31.7 (45)	27.5 (39)	11.3 (16)	0.7 (1)	7.0 (10)	4.8 (142)
Musculoskeletal	0.1 (1)	2.6 (20)	7.5 (58)	16.6 (129)	20.8 (162)	23.0 (179)	12.7 (99)	5.5 (43)	0.6 (5)	10.4 (81)	26.3 (777)
Mental health		2.5 (4)	13.3 (21)	21.5 (34)	20.3 (32)	16.5 (26)	5.7 (9)	3.2 (5)		17.1 (27)	5.3 (158)
Unfit/Sedentary		2.4 (5)	5.7 (12)	13.7 (29)	16.6 (35)	19.4 (41)	21.3 (45)	10.0 (21)	0.5 (1)	10.4 (22)	7.1 (211)
Other		4.3 (13)	7.9 (24)	15.6 (47)	13.6 (41)	22.5 (68)	16.6 (50)	10.3 (31)	0.3 (1)	8.9 (27)	10.2 (302)

General Practitioners (GPs) referred the majority of participants (72.4%, N=2124) onto the scheme (see Table 5.3) followed by practice nurses (13.1%, N=387) and physiotherapists (10.6%, N=315). Of the participants initially referred by GPs, the majority were referred for overweight or obesity (31.4%, N=672), followed by musculoskeletal (22.7%, N=486) and cardiovascular

disease (17.7%, N=379) reasons. Practice nurses' referrals were most commonly for overweight/obesity (43.7%, N=169), followed by cardiovascular disease (18.4, N=71). Musculoskeletal initial referral reasons accounted for over three quarters (78.4%, N=247) of all participants referred by physiotherapists. Overweight/obesity (43.0%, N=49) was the most common referral reason for the 'other' referring health professionals. The 'other' health professional category contained the following health professionals; health visitor, dietician, cardiac nurse, occupational therapist, smoking cessation officer, chiropractor, osteopath, staff nurse and clinical nurse specialist.

Table 5.3. Initial referral reason by referring health professional

Initial Referral Reason	General Practitioner % (n)	Practice Nurse % (n)	Physiotherapist % (n)	Other % (n)
Cardiovascular Disease	17.7 (379)	18.4 (71)	1.0 (3)	16.7 (19)
Overweight/Obesity	31.4 (672)	43.7 (169)	1.9 (6)	43.0 (49)
Diabetes	4.3 (92)	10.6 (41)	0.0	7.9 (9)
Musculoskeletal	22.7 (486)	10.3 (40)	78.4 (247)	3.5 (4)
Mental Health	6.6 (141)	2.6 (10)	0.0	6.1 (7)
Unfit Sedentary	6.6 (142)	8.5 (33)	9.2 (29)	6.1 (7)
Other	10.7 (230)	5.9 (23)	9.5 (30)	16.7 (19)
Total	72.4 (2142)	13.1 (387)	10.6 (315)	3.9 (114)

Over half of all referred participants when contacted by the CRM selected a local authority managed leisure provider (58.1%, N= 1718), followed by nearly a quarter that selected a leisure provider managed by the local education authority (24.3%, N= 720). A much smaller proportion chose private (2.9%, N= 86) and independent (1.4%, N= 41) managed leisure providers. A total of 13.3% were not allocated (N=393) to a leisure provider, this included those participants that did not have any contact with the CRM (6.7%, N=199).

The following logistic regression models were used to examine the associations between key independent variables (demographic characteristics of participants and scheme processes) and dependent variables (degree of participant progress through the scheme) (Section 4.1.3, Table 4.2, Figure 4.1).

5.1.2. Results of Logistic Regression Analysis

A strong association emerged regarding participants' referral reason and their progress through the scheme; those that were referred for overweight/obesity or mental health were significantly less likely to make contact, be allocated to a leisure provider or attend one session or more. Women, on the other hand, were more likely to be allocated to a leisure provider, but less likely to complete their planned physical activity sessions with them, whilst being older significantly increased participants likelihood of completing. Each models' results are explained in more detail below.

In Model 1, participants' initial referral reason was significantly related to likelihood of contact with the Central Referral Mechanism (Table 5.4). In particular, participants that had initial referral reasons of overweight/obesity (OR 0.586; 95% CI 0.362-0.951; p=0.03) or mental health (including depression and anxiety) (OR 0.353; 95% CI 0.188-0.663; p<0.001) were significantly less likely to have contact with the central referral mechanism (CRM) than those referred with cardiovascular disease (the reference category). Demographic and scheme process variables were not independently associated with likelihood of contact with CRM.

Table 5.4. Referral reason as a determinant of contact between participants and the central referral mechanism

	Odds Ratio	95% confidence interval	P value	N value	β value	Wald value
Referral reason	----	----	0.014*			15.900
Cardiovascular	1.00 (ref)	----	----	472	---	4.690
Overweight/obesity	0.586	0.362-0.951	0.03*	896	- 0.534	0.001
Diabetes	0.988	0.415-2.353	0.978	142	- 0.012	0.765
Musculoskeletal	0.796	0.477-1.328	0.382	777	- 0.229	10.506
Mental health	0.353	0.188-0.663	0.001***	158	- 1.040	1.067
Unfit/Sedentary	1.030	0.481-2.203	0.940	211	0.029	0.006
Other	0.722	0.390-1.339	0.302	302	- 0.325	1.067

Gender and health professional variables did not improve the model fit, so were not included in the logistic regression equation.

*Significant at <0.05, ** Significant at <0.01, *** Significant at <0.001

In Model 2, participants' demographic variables of gender and referral reason were significantly (p=0.011) related to their likelihood of being allocated to a leisure provider (Table 5.5). Women were significantly more likely (OR 1.250, 95% CI=1.003-1.559, p=0.047) to be allocated to a leisure provider than men

(the reference category). Participants referred with an initial referral reason of overweight/obesity (OR 0.695; 95% CI 0.495-0.975; $p=0.035$) or mental health (OR=0.550; 95% CI = 0.338-0.896; $p=0.016$) were significantly less likely to be allocated to a leisure provider compared to those referred with cardiovascular disease (the reference category). Scheme process variables were not independently associated with likelihood of allocation to a leisure provider.

Table 5.5. Gender and referral reason as determinants of participant allocation to a leisure provider.

	Odds ratio	95% confidence interval	P value	N value	β value	Wald value
Gender						
Male	1.00 (ref)	----	----	1116		
Female	1.250	1.003-1.559	0.047*	1842	0.223	3.930
Referral reason			0.011*			
Cardiovascular	1.00 (ref)	----	----	472	----	----
Overweight/obesity	0.695	0.495-0.975	0.035*	896	-0.364	4.430
Diabetes	1.585	0.806-3.119	0.182	142	0.461	1.779
Musculoskeletal	1.013	0.708-1.451	0.942	777	0.013	0.005
Mental health	0.550	0.338-0.896	0.016*	158	-0.598	5.764
Unfit/Sedentary	0.779	0.483-1.258	0.307	211	-0.249	1.042
Other	0.814	0.527-1.257	0.354	302	-0.206	0.860

Health professional variable did not improve the model fit, so was not included in the logistic regression equation

*Significant at <0.05 , ** Significant at <0.01 , *** Significant at <0.001

In Model 3 there were several significant associations (Table 5.6). Referring health professional ($p=0.006$) and initial referral reason ($p<0.001$) were included in the model as both variables were significantly related to the likelihood of participants attending one or more physical activity sessions with a leisure provider. In particular, participants with initial referral reasons of overweight/obesity (OR 0.639; 95% CI = 0.501-0.814; $p<0.001$), musculoskeletal (OR 0.759; 95% CI 0.582-0.990; $p=0.042$), mental health (OR 0.399; 95% CI 0.275-0.579; $p<0.001$) or other (OR 0.630; 95% CI 0.462-0.858; $p=0.003$) were all significantly less likely to attend one physical activity session or more with a leisure provider compared to those referred with cardiovascular disease (the reference category). Being referred by an 'other' health professional (other than a general practitioner, practice nurse or physiotherapist) was also related to a reduced likelihood (OR 0.540; 95% CI 0.369-0.792; $p=0.002$) of attending one or more physical activity sessions with a leisure provider compared to being referred by a general practitioner (the

reference category). Gender variable was not independently associated with likelihood of attendance.

Table 5.6. Referral reason and referring health professional as determinants of attendance at one or more sessions with a leisure provider.

	Odds ratio	95% confidence interval	P value	N value	β value	Wald value
Referral reason			<0.001***			
Cardiovascular	1.00 (Ref)	----	----	472	----	----
Overweight/obesity	0.639	0.501-0.814	<0.001***	896	-0.448	13.080
Diabetes	1.003	0.659-1.525	0.990	142	0.003	0.000
Musculoskeletal	0.759	0.582-0.990	0.042*	777	-0.276	4.123
Mental health	0.399	0.275-0.579	<0.001***	158	-0.918	23.350
Unfit/Sedentary	0.758	0.533-1.079	0.124	211	-0.277	2.367
Other	0.630	0.462-0.858	0.003**	302	-0.436	8.588
Health professional			0.006**			
General practitioner	1.00 (Ref)	----	----	2142	----	----
Practice nurse	1.032	0.817-1.304	0.790	387	0.032	0.071
Physiotherapist	1.218	0.919-1.615	0.170	315	0.197	1.880
Other	0.540	0.369-0.792	0.002**	114	-0.615	9.939

Gender variable did not improve the model fit, so was not included in the logistic regression equation

*Significant at <0.05, ** Significant at <0.01, *** Significant at <0.001

In Model 4, only age and gender were included in the model as they were both significantly related to the participants' likelihood of attending 80% or more sessions with a leisure provider (Table 5.7). As participants get older (coefficient of 0.016) the likelihood of completing 80% or more of their physical activity sessions with a leisure provider also increases (OR 1.016; 95% CI 1.010-1.023; p<0.001). For example, a 10 year increase in age results in a 16% increase in the likelihood of attending 80% or more sessions with a leisure provider. Women were significantly less likely to complete than men (reference category) (OR 0.823; 95% CI 0.681-0.994; p=0.043).

Table 5.7. Age and gender as determinants of attending participants completing 80% or more of their planned physical activity sessions with a leisure provider.

	Odds ratio	95% confidence interval	P value	N value	β value	Wald value
Age (years)	1.016	1.010-1.023	<0.001***		0.016	23.094
Gender						
Male	1.00 (Ref)	----	----	708		
Female	0.823	0.681-0.994	0.043*	1146	-0.195	4.076

Referral reason, health professional and leisure provider variables did not improve the model fit, so were not included in the logistic regression equation.

*Significant at <0.05, ** Significant at <0.01, *** Significant at <0.001

The results of the both the descriptive statistics and logistic regression analyses are discussed in relation to the research question which focuses on how referral processes and patient demographics relate to scheme attendance levels.

6.1 Discussion of descriptive data

Referred participants' demographics, referral processes and attendance frequencies are discussed initially to set the context for the discussion of the logistic regression model outcomes.

6.1.1. Age and gender

In the previous section, Table 5.1 illustrates the distribution of age and gender. Most participants that were referred onto the scheme were older and a high proportion were female. This is consistent with the previous evaluation of the ProActive scheme (Grant et al 1999) where 60% of participants were women (N=326) and the average age of participants was 50 years for women and 52 years for men. Published studies from other schemes report a similar pattern with women being more likely to be referred than men; reported percentages suggest that women accounted for between 58% and 76% of all those referred to physical activity referral schemes (Biddle et al 1994; Biddle & Mutrie 2001; Day & Nettleton 2001; Dugdill et al 2005; Fox et al 1997; Hammond et al 1997; Harland et al 1999; Harrison et al 2005a; Lord & Green 1995; Stevens et al 1998; Taylor 1996). Previous studies have also reported a greater prevalence of older participants with mean age ranging from 54 to 59 years (Day & Nettleton 2001; Dugdill & Graham 2005; Dugdill et al 2005; Harrison et al 2005a; Stevens et al 1998; Taylor et al 1998).

The higher proportion of women referred onto PARS may be explained by the simple fact that women are more likely to use primary care services than men. For example, data from the National Health Service (NHS) survey of patients reported that a higher proportion of women (87%) consulted their GP in the

previous 12 months than men (77%) (Department of Health 2002a). The fourth national survey of patient morbidity, which has not been updated since 1995, also reported that the consulting rate for women continued to exceed that for men (aged 15 to 64 years) (Office of Population Censuses and Surveys 1995). This survey investigated patients' reasons and level of consultation with their general practitioner and related health staff. The conditions or reason for attendance where this difference was most evident included; genitourinary disease, mental disorders, anaemia and routine check-ups and appointments (for example, birth control and neo-natal checks) (Office of Population Censuses and Surveys 1995). The General Household survey (2001) also found that more women (16%) than men (11%) consulted a GP during the 14 days prior to the survey. Further, women (from 16 to 44 years of age) were twice (15%) as likely to report consulting a GP compared to men (8%) of the same age (Office for National Statistics (ONS) 2002); on average women had five consultations with their GP each year whereas men had three (Office for National Statistics 2005).

Gender differences in consultation behaviour were explored by Kapur et al (2004). After excluding routine appointments (e.g. contraceptive advice and pregnancy screening) that are associated with the high level of attendance in women, they found that women still consulted twice as often as men. Further, chronic psychiatric illness (e.g. depression) and psychological distress (measured by the General Health Questionnaire 12 [Goldberg, 1972⁶]) were more strongly associated with consultation in women, while current somatic symptoms (e.g. aches and/or pains) and cognitive factors (e.g. negative illness attitudes) were more strongly associated with consultations by men (Kapur et al 2004).

The greater referral rate of older participants may again be explained by exposure to primary care services. For example, 12% of adults aged between 16 and 44 had consulted a GP in the 14 days prior to interview compared with 20% of adults aged 75 and over (Office for National Statistics 2005). This is

⁶ Goldberg, D.P. (1972). The detection of psychiatric illness by questionnaire. Oxford University Press: London. In: Kapur, N., Hunt, I., Lunt, M., McBeth, J., Creed, F. and Macfarlane, G. (2004). "Psychosocial and illness related predictors of consultation rates in primary care - a cohort study." *Psychological Medicine* 34: 719-728.

due to the greater amount of chronic conditions that are experienced with the aging process and the increasing elderly population (Department of Health 2001c), for example coronary heart disease and arthritis. The most common reasons for elderly patients to consult with their GP was for circulatory (mainly hypertension and coronary heart disease), respiratory diseases (for example, chronic obstruction pulmonary disease) and routine appointments (for example, influenza immunisation) (Office of Population Censuses and Surveys 1995). Increasing age brings greater incidence and prevalence of the following conditions; hypertension, coronary heart disease, overweight and obesity, diabetes mellitus, musculoskeletal problems (for example, arthritis), mental illness, stroke and chronic obstructive pulmonary disease (Office for National Statistics 2001b).

6.1.2 Referral reason

In Chapter 5, Table 5.2 illustrates the main referral reasons by age. Obesity accounted for over a third of all initial reasons for referral (30.3%), with more than a quarter of participants referred with musculoskeletal conditions (26.3%). Cardiovascular disease and related conditions (including high blood pressure) were the third most common referral reason accounting for 16% of all referrals. The majority of participants referred for overweight/obesity were between 30 and 59 years old as were those referred for musculoskeletal, while in contrast the majority of those referred for cardiovascular conditions were older (50 to 69 years).

Previous scheme evaluations reported similar findings, for example, overweight, obesity and weight reduction were the most common referral reasons in Hammond et al (1997) (43%); Dugdill et al (2005) (37%) and Lord and Green (1995) (32%). In contrast, the main referral reason reported by Harrison et al (2005a) was musculoskeletal (32.8%), followed by cardiovascular disease (29.9%) and overweight (10.4%). Some previous scheme evaluations have collated referral reasons for participants as there was one or more referral reason for each participant (e.g., Grant et al 1999; Taylor et al 1998), making comparisons difficult. Further, some studies do not have a referral reason for participants, due to participants being selected from surgery records according

to study criteria' (Harland et al 1999; Stevens et al 1998), selected using opportune recruitment methods by researchers (Harland et al 1999), or because they were investigating participant experiences of PARS using qualitative methodology (Crone et al 2005c; Hardcastle & Taylor 2001; Singh 1997; Stathi et al 2003).

Using only the primary referral reason in the current evaluation, allowed comparisons between participants so that a more accurate picture of the role of their demographic variables, including their referral reason, could be used to predict participants' progress (outcome) through the scheme. This approach was in line with Harrison et al (2005a) who used only the main referral reason in their prospective cohort study of sedentary participants (N=6610), when they investigated the association of referral reason in relation to scheme access and deprivation (Harrison et al 2005a).

To explain the greater proportion of participants with a referral reason of overweight/obesity it may be pertinent to argue that due to the visual nature of the condition people are noticeably overweight or obese, and that this provided a 'cue to action' for the referring health professional. Overweight and obesity are also risk factors for many conditions which are currently being targeted by public health, such as cardiovascular disease and diabetes (Department of Health/DCMS 2004b). Similarly, the link between physical inactivity and obesity has been highlighted within the popular media. Hammond et al (1997) found that GPs were more likely to advise physical activity to those that were overweight and sedentary, compared to those that were just sedentary.

One of the most popular reasons for consulting a GP (15%) is for musculoskeletal reasons (Office of Population Censuses and Surveys 1995), which is reflected in the high proportion of participants referred within this category (26.3%) in the current study, and reported by previous studies (Dugdill et al 2005; Harrison et al 2005a). The referral of these individuals may be due to supervised physical activity being an attractive alternative for the GP before resorting to other services which are costly and often have waiting lists due to limited availability, for example physiotherapy (National Audit Office 2001a).

Approximately one in six adults suffer from a mental health condition (16.7% of population) (Department of Health 1999a). However, since only 5.3% (N=158) of participants were referred with this as an initial referral reason, it may be argued that many participants had mental health conditions but this featured as secondary referral reasons. This may also be due to the stigma attached to mental health conditions and a lack of knowledge about the benefits of physical activity for mental health, so health professionals refer initially for physiological reasons or perhaps, that this represents those that met mild to moderate referral guidelines.

It is estimated that frequent consultation is strongly associated with amongst others, mental health problems, as studies investigating the workload of general practices estimated that 15% of patients account for nearly two thirds of health care costs (Campbell & Roland 1996; Kapur et al 2004; Ronalds, Kapur, Stone et al 2002; Scaife, Gill, Heywood et al 2000; Zantinge, Verhaak & Bensing 2005). Therefore, it is likely that a greater proportion of participants than this study indicates who are referred onto PARS have mental health problems.

Many of the most prevalent referral reasons reported by schemes may be linked to the public health policy at the time. For example, Taylor et al., (1998) reported hypertension (61%) overweight (48%) and smoking cessation (48%) as the most common referral conditions in their study. All of these conditions are risk factors associated with coronary heart disease, which the programme was designed to prevent and corresponds to the Government White Paper at the time (Department of Health 1992; Taylor et al 1998). A more recent evaluation by Harrison et al (2005a), reported that musculoskeletal (32.8%) was the most prevalent referral reason, followed by cardiovascular disease (29.9%) and overweight (10.4%). This shift in most common referral reason may reflect local health policy and be explained by the increasing awareness surrounding back pain and its effect upon the economy, and corresponds with the move towards disease prevention and the wider conditions targeted in public health (Department of Health 1999d 2004a).

The criticism levelled at studies looking at the effectiveness of PARS is that the referral reasons that are usually associated with PARS role to meet public health targets are often excluded. For example the Newcastle exercise project (Department of Health 2001a) excluded participants with cardiovascular disease and angina. This may be due to experimental studies not having access to appropriately qualified staff and thus lacking scope and ecological validity of established PARSs, which have the expertise and processes to deal with a greater variety of medical conditions that benefit from physical activity.

This Section has investigated through available literature why the majority of participants referred onto the PARS had the following characteristics: older, female and/or obesity/overweight (referral reason). It appears that the main reasons for these characteristics is that women and older people consult primary care more often, and GPs tend to target women. Further more obesity/overweight is a risk factor that is linked to many conditions targeted by public health and presents a visual cue for health professionals.

6.1.3 Referring health professional

General Practitioners (GPs) referred most of the participants onto the scheme (72.4%, N=2142); reflecting the findings of other studies (Harrison et al 2005a; Lord & Green 1995; Taylor 1996). This may be explained by the fact that schemes were traditionally called 'GP Referral Schemes' and were originally set up with the GP in mind as the main referring health professional. GPs rather than other health professionals make the majority of referrals. This may be explained by the greater ratio of GPs to practice nurses within a surgery (for example, one practice nurse to every two GPs) (Department of Health 2002b).

This evaluation is unique when compared to the majority of literature, which only mentions GPs as the referring health professional (Hardcastle & Taylor 2001; Lord & Green 1995; McKenna & Vernon 2004; Singh 1997; Taylor et al 1998) (Section 3.1.3), or both practice nurses and GPs (Hammond et al 1997; Martin & Woolf-May 1999; McKenna et al 1998; Smith et al 1996). While more recent literature has reported a greater variety in referring health professionals (Department of Health 2001a; Graham et al 2005) (Section 3.1.3) including the

health promotion activities of registered dietitians (McKenna et al 2004), none have had the opportunity to explore referring health professionals to the degree this research has done. This is a reflection of the unique way that data was collected as part of ProActive scheme processes by the CRM (author), and the developments in physical activity and health promotion over the last decade and the association of physical activity referral schemes with a broader range of health professionals.

Another possible explanation for a broader range of referrers may be due to the National Quality Assurance Framework (NQAF) for PARS (Department of Health 2001a) which outlines the role of referring health professionals to facilitate physical activity with their patients' and ensure the smooth running of PARS (Department of Health 2001a). In particular the NQAF for PARS recommends that health professionals should facilitate behaviour change and that GP's should follow up on their patient's progress. It also sets out a framework to ensure the quality of PARS, reducing the barriers of referring, by ensuring that all referring health professionals feel confident in using PARSSs. Recently, the Government has added to this, outlining that it is the responsibility of all NHS staff to promote physical activity (Department of Health 2005), which will further increase the variety of health professionals promoting physical activity to their patients.

However, there is a move away from 'GP referral' with changes in both schemes and public health policy over the past decade. There has been an increasing move towards disease prevention via health promotion (Department of Health 1992), with a much greater emphasis placed on the delivery of health promotion by practice nurses and health visitors (Department of Health 1999c). This in turn has led to a responsibility for all health professionals to deliver health promotion in the future and link with health related professionals in other environments to co-deliver health related activity, for example, physical activity referral schemes (Department of Health/DCMS 2004b). However, in light of the greater number of GPs in relation to other health professionals and their link with PARSSs it is unlikely that referrals by other health professionals will outnumber those made by GPs. Health professional are discussed in more detail in relation to the findings of Model 3, attendance in Section 6.1.3.

6.1.4 Leisure provider

In this study the scheme leisure providers in Somerset were differentiated by who managed them and they were placed in the following categories: local education authority, local authority, private and individual. The majority of participants (67%) attended schemes managed by the local authority (LA), while just over a quarter (28.1%) of participants attended local education authority (LEA) managed facilities, with a small proportion attending private and individual centres (3.4% and 1.6% respectively).

The larger number of ProActive participants choosing local authority leisure centres was partly due to them accounting for the majority of physical activity referral schemes in Somerset (Section 4.1.5.). They also tended to be larger facilities, offered a greater variety of activities and choices of session times at low prices. Whereas, in contrast, the LEA schemes tended to have smaller facilities at a similar price to the LA schemes, offered a limited amount of sessions as priority was given to the schools and colleges with whom they were affiliated. Over the duration of this study there were only two schemes that were privately managed and these were inclined to be more expensive and offer less variety than the LA and LEA managed schemes.

The models of physical activity provision provided by PARS have received little attention over the past decade. Biddle et al (1994) evaluated 157 and 35 planned schemes in the United Kingdom and identified two models of scheme management: practice or leisure centred managed. Practice managed schemes had the greatest variety in structure and complexity, provided advice and practice based clinics. While, leisure centre managed schemes were the most popular scheme model (accounting for 67.6%), and included private health clubs. These schemes tended to be initiated by leisure services, general practitioners or district health authorities (Biddle et al 1994; Fox et al 1997).

The leisure providers evaluated in this study were typical of the programme model described by both Biddle et al. (1994) and in the Government

recommendations for PARS (Department of Health 2001a) (for more information see Sections 1.4, 3.2, 4.1.1 and Figure 4.1).

Previous studies report the type of physical activity offered to participants by physical activity referral schemes. A large majority of evaluations report that all participants were sent to a leisure provider near to the surgery (Day & Nettleton 2001; Dugdill & Graham 2005; Harrison et al 2005a; Lord & Green 1995; Smith et al 1996; Taylor et al 1998), some of which mention that a variety of physical activity was offered (Lord & Green 1995; Smith et al 1996) with one mentioning providing supervised physical activity (Taylor et al 1998). Much of the activity provided by schemes at leisure centres was either subsidised (Harrison et al 2005a; Taylor 1996), at the same price as a prescription (Lord & Green 1995), or provided free (Hammond et al 1997; Harland et al 1999). Unlike the current study, these studies did not offer a countywide service with a variety of leisure providers for participants to choose from.

6.1.5 Attendance

Attendance measures were taken from leisure provider records in order to gain an objective measure of attendance (see Sections 4.1 and 4.2.3). Only a small number of previous evaluations have used leisure provider records of attendance (e.g. Jackson et al 1998; Taylor 1996).

The high attendance level used to determine completion in the current evaluation (i.e. $\geq 80\%$) was an attempt to identify those that had attended for the majority of their planned physical activity sessions. In comparison, previous PARS evaluations have varied in how they have measured completion. PARS completion has been defined and measured by studies in many different ways, for example;

- attendance to all three consultations with an exercise professional (Dugdill & Graham 2005)
- attendance of final consultation and still physically active at twelve weeks (Lord & Green 1995)

- attendance of sessions and consultation after ten weeks (Jackson et al 1998)
- self reported physical activity based on national fitness survey (Harland et al 1999; Stevens et al 1998)
- attendance of fifteen or more physical activity sessions (Taylor et al 1998)

In contrast the current study used a percentage ($\geq 80\%$) of actual attendance against planned scheme attendance. In agreement with the current evaluation Taylor et al (1998) also used measures of attendance of physical activity sessions with the leisure provider. They also differentiated between low ($< 75\%$) and high ($\geq 75\%$) attenders, which was set at the point that physiological benefits were thought to occur (Taylor et al 1998).

Further, attendance has been treated as an objective measure in the current study, since attendance measures were taken from leisure providers' records. However, despite this, arguably due to the time constraints placed upon PARS staff and co-ordinators, some of the records were not fully completed (which were removed from dataset, Section 4.2.4 and Figure 4.3), or may not have been accurate (Section 4.2.4 and Chapter 8) and some may have been influenced by social desirability, in order for schemes to appear to be effective. This was reduced as much as possible by requesting missing information, removing participants incomplete records and not including an area that used a different referral processes to the rest of the county (Section 4.2.4).

6.2 Determinants of attendance

In order to answer the research question, 'In what ways do certain facets of the referral process and patient demographics relate to scheme attendance levels?', participants were differentiated for analysis using their level of attendance. This outcome was derived from where they exited the scheme (Section 4.1.3 Figure 4.1) and relates to each logistic regression model. This outcome was analysed in relation to which scheme processes altered the likelihood for participants exiting or continuing to travel on to the next stage,

and is discussed in more detail within the context of each of the logistic regression models.

6.2.1 Model 1: Contact

The outcome used in this model relates to whether individuals had made contact or not with the central referral mechanism (CRM) (see Chapter 4.1, Figure 4.1). The majority of schemes in the United Kingdom have a model of practice where patients are referred by their health professional directly to the leisure provider (Department of Health 2001a). Therefore, data is only collected from participants' point of contact with the leisure provider. Consequently there is little information about individuals that initially agreed with their health professional to be referred for physical activity but then did not attend.

A key strength of the current study is that data from participants' initial point of contact and referral by their health professional was recorded. Increasingly, the importance of this type of data has been realised in the development of these schemes (Department of Health 2001a). To date only one other published study, which was also based on the ProActive scheme, has looked at the reasons for participant removal prior to starting physical activity with a leisure provider (Johnston et al 2004). Johnston et al (2004) reported a similar proportion of participants (5%, N=135) had no contact with the CRM as the current study (6.7%, N=199). This study is discussed in more detail in relation to the findings of Model 3 in Section 6.2.3.

Previous studies have hinted at the collection of data prior to participants attendance with a leisure provider, but have failed to analyse these data in their evaluation (e.g. Harrison et al 2005a; Johnston et al 2004; Lord & Green 1995). This is perhaps because scheme evaluations have focussed on those who attend PARS in assessing their effectiveness as a public health intervention (Riddoch, 1998), many focusing on biomedical improvements such as blood pressure and body composition (Dugdill & Graham 2005).

Model 1 found that participants that had initial referral reasons of overweight/obesity or mental health were significantly less likely to have contact with the central referral mechanism (CRM) than those referred with cardiovascular disease, despite having already agreed with their health professional to be referred for physical activity. Those that are obese or overweight have perhaps greater barriers to overcome in taking up physical activity as it is consistently negatively associated in population studies with a physically active lifestyle (Troost, Owen, Bauman et al 2002). This is particularly disturbing, considering that this is the most common referral reason and of the consequences to health that are associated with being overweight (Department of Health 2004a). The barriers experienced by overweight and obese individuals and those with mental health conditions in relation to physical activity may be due to the many physiological and psychological factors that these conditions present; these barriers are discussed later in Sections 6.2.3, 6.3.2 and 6.3.3.

Perhaps the most difficult aspect of examining individuals that do not have contact with the CRM is their 'silence', allowing only educated conjecture until we are able to fully investigate these individuals' reasons for not making contact. Those referred for overweight/obesity or mental health conditions initially agreed to be physically active with their referring health professionals and are then more likely to have no contact with the CRM. Firstly, this may be due to these individuals having greater barriers to overcome than other individuals referred for physical activity (Biddle & Mutrie 2001). Secondly, it could indicate that health professionals did not assess their patient's intention to start being physically active (Department of Health 2001a). Or because of barriers which are not articulated to the referring health professional in relation to scheme uptake in Section 6.2.3 and health professionals' use of the scheme in Sections 5.1.5 and 3.1.

6.2.2 Model 2: allocation to a leisure provider

The outcome of this model, relates to whether participants were allocated to a leisure provider or not. Participants chose leisure providers via contact with the CRM (Section 3.2.4). Participants that had no contact or that asked to exit the

scheme were compared with those that chose a leisure provider to take physical activity with. Data relating to whether participants choose a leisure provider or not, has had little exposure in previous studies apart from Johnston et al (2004). Logistic regression revealed that women were more likely than men to be allocated to a leisure provider. Further, similar to the findings of Model 1 (Section 6.2.1), participants with an initial referral reason of overweight/obesity or mild mental health conditions were less likely to access the scheme and be allocated to a leisure provider.

In agreement with the findings in the present study, previous studies have also found that women were more likely to take up referral than men (Lord & Green 1995; Stevens et al 1998). Women also account for the majority of participants referred onto the ProActive PARS, some evidence that may help to explain this was discussed previously in Section 6.1.2.

The increased likelihood of women being allocated to a leisure provider may be because women were more likely to be able to attend the leisure providers supervised physical activity sessions, which were usually run during off peak times typically between 9am and 5pm. Since women make up less than half of the UK workforce (44%) (Office for National Statistics 2001b), and they still continue to be the primary care givers in the home (Mackey-Jones & McKenna 2002), these times may suit women more than men.

The findings of Models one and two are similar in that participants with initial referral reasons of overweight or mild mental health were significantly less likely to access the scheme than those referred for cardiovascular reasons. From the comments made by participants that were contacted but were removed from the scheme are discussed in the findings of Johnston et al's (2004) analysis of removal reasons (Section 6.2.1 and 6.2.3), and in research concerning the barriers associated with overweight and mental health conditions (Sections 6.1.2, 6.3.2 and 6.3.3), it may be concluded that barriers had a significant role to play in preventing these individuals from accessing the scheme after being referred by their health professional (Section 6.3.5).

6.2.3 Model 3: Attendance

The outcome in Model 3 is whether participants attend one session or more with a leisure provider. This is the point where the majority of other published work in this area commenced their data collection (e.g. Harland et al 1999; Lord & Green 1995; Taylor et al 1998). After agreeing to be active with both their health professional and the CRM, some participants did not attend their first session with their chosen leisure provider. Biddle and Mutrie (2001) memo that there is still little evidence regarding the determinants related to starting physical activity that the findings of this model relates to, as much of the recruitment of participants undertaken by studies that looked at adoption were either self-selected or were not representative of the population. Adoption of both moderate and vigorous intensity physical activity is however usually related to self-efficacy, knowledge and attitudes (Sallis et al 1986).

In Model 3, participants with initial referral reasons of, overweight/obesity, mental health, musculoskeletal or other (Including; cancer, respiratory, fatigue, peripheral vascular disease, stroke, brain tumour, immobility, smoking cessation, not stated, multiple sclerosis, rehabilitation – chemical dependency, see Appendix 4 for full list) were all significantly less likely to attend one physical activity session or more with a leisure provider compared to those referred with cardiovascular disease. Being referred by an 'other' health professional (e.g., health visitor, dietician, cardiac nurse, occupational therapist, smoking cessation officer, chiropractor, osteopath, staff nurse and clinical nurse specialist) was also significantly related to a reduced likelihood of attending one or more physical activity sessions with a leisure provider compared to being referred by a general practitioner.

Participants referred by 'other' health professionals were less likely to attend compared to those referred by a general practitioner. Unlike GPs, nurses and physiotherapists, 'other' health professionals did not refer participants to the scheme as often (Section 6.1.3), possibly because historically the scheme is set up for GPs, and information about the scheme has perhaps taken longer to be disseminated to health professionals throughout the county. It is likely that other health professionals were less influential and supportive than GPs and

practice nurses (McDowell et al 1997; McKenna et al 1998; Stathi et al 2003). Furthermore, other health professionals may not have been as familiar with the referral processes or have the type of ongoing rapport with patients that GPs and practice nurses may have had.

The reported effectiveness of GPs and nurses by previous studies of PARS differs. Participants' attendance was found to be the same for those referred by a practice nurse or a GP (Martin & Woolf-May 1999). While two studies found that nurses were more effective than GPs (Graham et al 2005; McDowell et al 1997), this is perhaps due to their greater role in health promotion and the greater support that they give to patients, by following up on their progress. These differences in the effectiveness of health professionals, possibly has more to do with barriers. Many health professionals cited the limited amount of time with patients, lack of knowledge of the benefits of physical activity and medicolegal concerns as a barrier to promoting physical activity (Gould, Thorogood, Iliffe et al 1995; Graham et al 2005; McKenna et al 1998; Smith et al 1996). The importance of an ongoing relationship in combination with providing participants' with experience of physical activity through rehabilitation exercises may partly explain why physiotherapists were as effective as GPs in the current study (Sections 6.1.3 and 6.2.3). It could be argued that the quality assured processes of the ProActive PARS (Crone et al 2004) (Sections 3.2.3, 3.2.4, 3.2.6 and 3.2.7) reduced process related barriers for health professionals and perhaps increased their confidence to use the scheme, as the scheme framework ensured that health professionals received feedback (Section 3.2.6), communication of all stakeholders was facilitated by the CRM (Section 3.2.6), leisure providers were quality assured (Section 3.2.4) and the CRM risk stratified all participants according to the inclusion criteria (Sections 3.2.6 & 3.2.7).

Recently, Harrison et al (2005a) also conducted a population cohort study and used main referral reason in relation to participant's access to schemes (i.e, attendance). In contrast they found that mental health, cardiovascular disease, fitness and overweight were all significantly associated with attending the first appointment compared to those in the 'none specified' category. The findings reported by Harrison et al (2005a) may be skewed due to the use of 'none

specified' as their reference category for logistic regression analysis, as this category relates to those that health professionals did not give a main referral reason. As the criteria for inclusion in the scheme was being inactive, the authors considered that a blank referral reason meant 'inactive' rather than health professionals not completing the form fully. Instead this reference category points to participants that do not have a clear reason for being referred onto the scheme and may be less likely to attend than those that have a known condition that might benefit from physical activity, e.g., overweight (Singh 1997; Stathi et al 2003). In contrast, the current study used cardiovascular disease as the reference category as this is the reason that the ProActive PARS was originally set up.

The reasons given to the CRM for patients not wishing to be allocated to a leisure provider were investigated by a previous study of the ProActive scheme (Johnston et al 2004). The categories of removal were developed using thematic inductive analysis of reasons given by the CRM for removal of participants. These consisted of medical and psychosocial categories of removal (Johnston et al 2004). The psychosocial category included those removed because they were not allocated to a leisure provider. Common barriers were given by participants as reasons for not participating in the scheme included time, cost, transport, and childcare (Johnston et al 2004). The removal of participants that had barriers to taking up their referral (including no contact) indicates the effectiveness of the CRM for removing some (18.8%, N=193) of the participants with barriers to accessing physical activity. However, a large number of participants that are included in the non-attendance category, agreed with their health professional and the CRM to be more active, but failed to attend with leisure providers (61.7%, N=632) (Table 4.2). This indicates the need for more support for groups that are less likely to attend and better assessment of barriers for individuals.

Again participants with mental health or obesity/overweight referral reasons were more likely to exit the scheme at this stage, and not attend their initial session with their chosen leisure provider. Those referred with musculoskeletal and 'other' referral reasons were also less likely to attend. The phase in participants journey through the scheme that Model 3 relates to also marks the

largest exit point (21%, n=632) by participants (see Figure 4.3). An explanation for this is perhaps that the CRM was not as effective at removing participants (7%, n=193) (although participants removed by the CRM for medical reasons (n=200) were not included in the data analysis) prior to being referred to a leisure provider. This may be due to several factors. Firstly, the CRM may not have provided a reasonable opportunity for participants to exit the scheme. Secondly, the limited time available for each participant reduced the effectiveness of the brief negotiation technique used by the CRM (Chapter 8). Finally, social desirability may have caused participants to agree to be referred to a leisure provider rather than say that they did not want to be (Biddle & Mutrie 2001).

People with musculoskeletal referral reasons were significantly less likely to attend one session or more with a leisure provider, than those with cardiovascular disease. Included in this category are both rheumatoid arthritis, which occurs twice as often in women (Stenström & Minor 2003) and has symptoms of pain, stiffness and fatigue and an irregular nature of attacks (ACSM 1997). Osteoarthritis, also has symptoms of pain and stiffness (ACSM 1997) as well as joint injury and pain. The reduced likelihood of attendance by participants in this category is perhaps because of barriers associated with the symptoms of pain and stiffness and concerns of injury, which was cited as a barrier by older people attending a PARS (Stathi et al 2003).

Participants in the 'other' referral reason category were also less likely to attend, this category included the following referral reasons; cancer, respiratory, brain tumour, chronic fatigue, epilepsy, stroke/CVA (cerebral vascular accident), multiple sclerosis, Parkinson's, rehabilitation – chemical dependency, head injury and head ache/migraine (see Appendix 4). These categories were placed in the 'other' category because they were not included in the Government targets and had less evidence for the effectiveness of physical activity (Austrian, Kerns & Reid 2005) (Sections 4.1.5 and 4.2.5). Possibly participants in the other category were less likely to attend, because physical activity is not actively promoted for these conditions, thus these individuals may not see the efficacy of it for them, which has also been cited as a barrier for taking up physical activity for older people suffering from chronic

pain (Austrian et al 2005). There may also be barriers associated with the symptoms and characteristics of the condition, for example, it is documented that participants with chronic fatigue have less trust of medical and lay professionals due to the misunderstandings surrounding their condition (ACSM 1997). Further, chronic fatigue is characterised by low energy, often with depression and sometimes with soft tissue pain (ACSM 1997), adding to the barriers for these participants taking up physical activity. Individuals in the other category may also be more susceptible to secondary conditions associated with enforced inactivity, such as hypertension, obesity and diabetes.

Participants in Models 1, 2 and 3 were consistently more likely to access the scheme at these points if they had cardiovascular conditions compared to those with depression/mental health conditions and overweight/obesity. As will be revealed in the next section, this is in sharp contrast to the findings of the last logistic regression analysis model, which explored predictors of participants completing their planned physical activity sessions with the leisure provider.

6.2.3 Model 4: Completion

The likelihood of completing 80% or more planned physical activity sessions with a leisure provider became more likely as age increased. Further, men were more likely to complete than women. In comparison with the previous three models that were related to different levels of access, referral reasons of overweight/obesity or mental health did not significantly reduce the likelihood of completion. This indicates that the outcome of this model is influenced by factors that were not present in the previous three models.

Some previous PARS studies have reported similar findings. Dugdill and Graham (2005) also found that completion was higher in men, increased with age, but unlike the current study, attendance was dependent on referral reason, as overweight referral reasons were associated with lower attendance while post heart attack referral reasons had higher attendance levels. Similarly, the previous evaluation of ProActive reported that older people were more likely to complete, in addition to non-smokers, and participants with musculoskeletal referral reasons (Grant et al 1999). In contrast, participants that were non-

smokers, obese/overweight or moderately active before starting were characteristics related to completing (Taylor et al 1998). Lord and Green (1995) also reported that those that were already active were more likely to complete 10 weeks of physical activity, plus, women, retired or part-time workers. Munro (1997) also reported higher attendance for women and those most active before starting. However, unlike the current study, all these studies apart from Dugdill and Graham (2005) had small groups of participants and used data analysis techniques that provided associations between discrete variables, but did not identify determinants.

The greater likelihood of completion as age increased may have been due to several factors associated with increasing age; fewer time pressures, influence of the referring GP, importance of health and enjoyment of the physical activity offered by ProActive. Older participants were more likely to be retired (Office for National Statistics 2001b 2005). As people got older (over 55 years) their main barriers for physical activity shifted from worries about time to not being the sporty type (The Sports Council and Health Education Authority 1992), indicating that older participants had more time than younger participants. Age was found to be positively associated with physical activity completion by Anton Perri, Riley et al (2001). This was perhaps because older participants preferred moderate intensity physical activity (Sallis & Owen 1999). Anton et al (2001) reported higher attendance in moderate intensity physical activity compared to vigorous intensity. ProActive leisure providers' predominantly offered moderate intensity, supervised physical activity sessions, usually during working hours and these factors may have contributed to the increased likelihood of older people completing.

Being referred by a GP has been consistently reported by older people as a reason for attending (Hardcastle & Taylor 2001; Stathi et al 2003). This is thought to be due to reverence older people have for their GP, which is often referred to as the 'powerful other' influence (Taylor 2003). Equally, referral may have focussed their attention towards health, which is also a common reason for older people becoming physically active (Wankel 1993), particularly as Resnick and Spellbringer (2000) observed that older people had greater awareness of health issues and consequently were more motivated to engage

in preventative health than younger people. These highlight the complex surface motives that assist in explaining older peoples increased likelihood of completing 80% or more planned physical activity sessions with a leisure provider.

The gender difference in completion may be due to the different motives of men and women. Men and women mainly shared the same reasons of re-creation, fitness, enjoyment and weight management, for being physically active, with the exception of competition, which was an important reason for men only (Biddle & Mutrie 2001). The social environment is thought to have greater importance for women, as they prefer to attend with a friend and are susceptible to the influence of others. While for men, previous experience (confidence), competition and social recognition were important determinants of physical activity behaviour (Biddle & Mutrie 2001; Sallis et al 1992). This indicates that the physical activity offered by the leisure providers may have met the criteria for men more than women.

The leisure provider variable was only present in this model exploring completion, as prior to this participants did not experience leisure providers. Although environment is related to enjoyment and participant attendance, the variable of leisure provider used in the current study (Sections 4.1.3 and 4.2.5) was not a significant predictor of completion. This is most likely due to the way that the leisure provider variable was categorised, as it was not possible to distinguish factors known to be influential in constituting an 'environment and culture' which include, the environment and culture of the facility, participants perceptions of physical activity sessions, the exercise professional (Crone et al 2005c). This was due to the difficulties of collecting this type of data over the three-year data collection period, partly due to continuing scheme development and staff changes. The result was that leisure providers were categorised according to leisure provider management type.

The findings of the current evaluation are significant considering that the majority of participants referred onto PARS are women, but men are more likely to complete. The implication of this is that the scheme is not meeting the needs of the most predominantly referred group, women, who are less likely to

attend 80% or more sessions than men. This may be due to a consistently perceived lack of competence, which was a significant barrier for twice as many women than men (Wankel 1993), reflected in a regularly cited barrier 'not the sporty type' (Health Education Authority 1995; Zunft, Friebe, Seppelt et al 1999). Lack of time was also a major barrier for women (16 to 54 years) (The Sports Council and Health Education Authority 1992) and looking after children/elderly dependents (Zunft et al 1999). Previous research points to this being due to women's principal role as primary care givers (Denton et al 2004; Mackey-Jones & McKenna 2002). Due to the current economic climate and changing gender roles more women are working, a greater proportion are married women with children (73%) compared with single women (61.7%) and single women with children (48%) (Office for National Statistics 2001b 2005). In turn this produces a conflict between work and home responsibilities (Mackey-Jones & McKenna 2002) as family responsibilities fall to women as the main support for family and children. This may explain the finding that women are less likely to complete their physical activity than men, due to women's ethic of care and feeling less deserving of leisure time (Kay 1998; Miller & Brown 2005). For those that are working and have families many do a double day working at their job and then at home (Mackey-Jones & McKenna 2002), leaving little time for physical activity.

In relation to Government policy for older people (Department of Health 2001c), the success of older people in completing the scheme highlights that the older population are open to becoming more active. Population studies and surveys consistently report that age is inversely related to physical activity levels (De Moor, Beem, Stubbe et al 2006; Office for National Statistics 2001b 2005; Trost et al 2002). See Tai, Gould & Iliffe (1997) report that half of over 65 year olds are inactive compared to their under 65 compatriots and further that they had no intention of becoming physically active. This may, however, be due to increasing levels of chronic disability and diseases (Department of Health 2001c) rather than behavioural norms, because as people get older they are expected to slow down, their family and friends are less supportive, due to a decline in their own physical activity levels and fears of injury (Hardcastle & Taylor 2001; See Tai et al 1997; Stathi et al 2003). The findings of the current study highlight that older people that are provided with the opportunity for

supported access to physical activity are more likely to complete and have the potential therefore to increase their physical activity levels.

Unlike Models 1, 2 and 3 where referral reason was associated with the likelihood of accessing the scheme and in turn physical activity, this was not a determining factor in Model 4. Age and gender predicted completion in Model 4. This may be because older people were motivated to improve their health, had more time, were influenced by their GP and preferred moderate intensity physical activity. Men's greater likelihood of completing may be due to preferring the physical activity offered and having fewer constraints on their time than women. The influence of age is unknown for Models 1, 2 and 3, as it was not used due to missing age data in these categories. Gender was also a factor in being allocated to a leisure provider in Model 2.

6.3 Common determinants and influencing factors

The following section discusses overweight/obesity and mental health referral reasons, which were consistent determinants of contact, allocation to a leisure provider and attendance (Sections 6.2.1 to 6.2.3). In addition, the barriers, motives and associated factors that assisted in providing an explanation of the findings of the Models are discussed.

6.3.1 The influence of barriers, motives and expectations

Barriers provide possible explanations for the determinants associated with participants accessing or exiting the scheme, identified by the models. The literature discussing barriers has very little information about the contact (Model 1) and leisure provider allocation phases (Model 2) of this study (Biddle & Mutrie 2001; Dunn 1996). This deficiency is thought to be mainly due to the recruitment process of participants taking place prior to the start of many research projects (Dunn 1996). Consequently the uptake phase has taken place prior to the start of the study and data collection.

Barriers are however, less influential when the benefits seem to be greater, goals are realistic and there is support. Steptoe, Rink and Kerry (2000)

reported in their study that participant perceptions of the benefits and barriers of physical activity were influential. Participants that perceived more benefits and fewer barriers following behavioural counselling were more likely to increase their physical activity levels (Steptoe et al 2000). Expectations of outcomes arising from participating in a PARS were investigated by Jones, Harris and Waller (1998). They found that both realistic aims and expectations of outcomes from a programme of physical activity were important predictors of success (Jones et al 1998). This indicates the importance of discussing participants' perceived benefits, barriers and expectations of taking up physical activity early in the PARS process to increase access and remove those that are not ready to take up physical activity. Elley, Kerse, Arroll et al (2003) found that providing support to patients referred for physical activity, by providing exercise counsellors, was effective in increasing physical activity and improving quality of life over twelve months. It may be pertinent to argue that the brief motivational interviewing technique used by the CRM was not as effective for those with mental health, obesity/overweight or musculoskeletal referral reasons. However, limited time for the CRM to deliver this may be partly to blame, in addition to the medium of the telephone to undertake this (Section 8.4).

6.3.2 Influence of mental health referral reason

Mental health referral reasons were consistent determinants across three models relating to participants lack of contact, allocation to a health professional and access to physical activity (Section 6.2.1 to 6.2.4). A possible explanation for this is that the common symptoms associated with depression may present considerable barriers; symptoms include: low mood, diminished interest or pleasure in activities, fatigue or loss of energy, feelings of worthlessness and significant weight loss or gain (Biddle & Mutrie 2001). Issakidis and Andrews (2004) also reported that clients with depression had a much lower rate of uptake of therapy services. The findings of the current study and that of Issakidis and Andrews (2004) indicate that taking up physical activity may be more difficult for those with mental health problems.

6.3.3 Influence of obesity/overweight referral reason

Obesity and overweight referral reasons were also consistent determinants of no contact, not being allocated to a leisure provider and non-attendance (Section 6.2.1 to 6.2.3). A possible explanation may be that the physiological and psychological characteristics associated with obesity/overweight may present greater obstacles to taking up physical activity. Obese individuals experience greater physiological strain, get hot quickly, are more easily fatigued and may feel embarrassed about their size (Biddle & Mutrie 2001). Perceptions of physical activity were also important, since a cross-sectional population survey in Australia found that perceptions of being 'too fat' to be physically active was a common barrier among the obese (22.6%) compared to overweight (5.3%), and more women (6.2%) reported that being too fat was a barrier compared than men (2.2%), while significantly more men reported injury as a weight-related barrier (Ball, Crawford & Owen 2000). This indicates the importance of reducing the barriers of accessing physical activity for this prevalent target group. The success of the scheme for older participants provides some insight of what can be achieved once participants access the scheme.

6.3.4. Influence of cardiovascular referral reason

The increased likelihood of contact, allocation to a leisure provider (uptake) and attendance (Models 1 to 3) (Sections 6.2.1 to 6.2.3) of those with cardiovascular referral reasons, may possibly be owing to a greater association by health professionals and participants of cardiovascular conditions with mortality. This link is probably due to longstanding health promotion targeted to those at risk and suffering from cardiovascular conditions by the Government (Department of Health 1992 2000a 2004a) (Section 1.4). Additionally, this association is strengthened by the historical link between ProActive PARS and CHD (Section 3.2.1), as the scheme was originally set up to meet CHD targets. It may be pertinent to argue that health professionals referring to ProActive associated the supported physical activity offered by the scheme (Section 3.2.8) as a suitable intervention for patients with cardiovascular conditions and risk factors. Cardiovascular referral reasons were the third most common

referral reason (16%) and the majority of participants were older (Section 6.1.2 Table 5.2). The endorsement of physical activity by a GP appears to be an influential factor, particularly for older people. Some participants in this category may also be suffering from angina, which usually has symptoms of chest pains and breathlessness, which may provide an additional motivation.

6.3.5. Lack of uptake and attendance of those with obesity/overweight and mental health referral reasons

The consistent lack of access and subsequent attendance by participants with referral reasons of obesity/overweight and mental health conditions (Sections 3.1.2 to 3.1.3 and 6.2.1 to 6.2.3) are concerning, particularly considering the lower health status of those with mental health conditions (Biddle & Mutrie 2001; Corti, Donovan & Holman 1996; Crone et al 2005a) and the chronic conditions that obesity is linked to (Department of Health 2004a). These positive mental health and psychosocial benefits for participants have been reported by previous evaluations that have examined participants' experiences of PARS (Ashley & Bartlett 2001; Crone et al 2005c; Hardcastle & Taylor 2001; Singh 1997; Stathi et al 2003). The Government guidelines for PARS recommended that health professionals should assess readiness to change and provide support (Department of Health 2001a) (see Sections 3.1.2 and 3.1.3). It may be pertinent to argue that the large number of participants not accessing the scheme in Models 1 to 3, indicate that participants with referral reasons of obesity/overweight and mental health need additional support throughout the referral process. The previous evaluation of ProActive also reported that those with mental health and obesity/overweight referral reasons were less likely to attend (see Section 3.2.3, Appendix 9) (Grant et al 1999). It is disappointing that these groups are still not accessing the scheme. It might be argued that the introduction of the CRM to increase access was not fully successful for these individuals, due to the large number that failed to attend their first appointment with a leisure provider (Sections 3.2.6, 6.2.3, 8.4 and Figure 4.3).

6.3.6 Influence of leisure provider

In terms of scheme processes the proportion of participants that completed (32% n=936) indicate that leisure providers were influential. Quality assured services provided by the ProActive scheme (Crone et al 2004) (Sections 3.2.3 to 3.2.9 Figure 3.1), and outlined in NQAF for PARS (Department of Health 2001a), facilitates an environment that provides participants with positive physical activity experiences. Positive experiences have been found to be very influential for continuing to be physically active (Crone et al 2005c; Gidlow et al 2005; Wankel 1993) and for lifelong physical activity (Biddle & Mutrie 2001). Stathi et al (2003) found in their study of older people attending a PARS, that the environment for physical activity was important for attendance, with many participants preferring free-living home based activity, which is as beneficial to health as structured physical activity (Dunn et al 1999). The preference of lifestyle or daily living (house-hold chores, active transport) physical activity may be due to it having more purpose and meaning (Hardcastle & Taylor 2001; Morgan 2001) than gym based exercises which older people are usually less familiar with. Hardcastle and Taylor (2001) also reported that the gym environment provided social inclusion and sense of improvement, which is important for encouraging physical activity and improving mental health (Hardcastle & Taylor 2001). ProActive leisure providers that offered a wide variety of physical activities, such as, golf, health walks, pilates, swimming in addition to supervised gym session were popular with participants; they also worked to generate positive experiences by creating welcoming and less intimidating environments. For example, reducing the volume of the music, and providing supportive social atmosphere (Section 3.2.8).

6.4. Limitations

Logistic regression analysis often generates unexpected results, which can make interpretation difficult, as variables that are known to be related to outcomes, may not be as significant or as predictive when combined with other variables (Tabachnick & Fidell 1996). The stepwise procedure was used as the method for the current study in order to discover associations, all variables are treated as if they were entered last. Since, binary outcome categories

simplified the interpretation of the resulting odd ratios and it was possible to explain the results of the logistic regression models with associated literature, the researcher believes that the results genuinely reflect the scheme characteristics.

Although the attendance data provides an objective variable on which to base assumptions that arise from data analysis (Section 4.1.3), it is simplistic to assess scheme success from attendance levels alone. Rather, it reflects only part of the picture, because attendance is only measured when participants attend physical activity sessions with the leisure provider. Any physical activity that occurs outside of these sessions is not recorded. Habitual physical activity levels have been shown to decrease when undertaking structured physical activity (Sallis & Owen 1999). The current scheme actively promoted increasing habitual physical activity levels by encouraging participants to increase physical activity within their lifestyle. Wider conclusions concerning the success of the scheme in relation to increased physical activity levels outside of scheme attendance would not be appropriate, as this was not measured.

A further barrier not examined by the current study was the influence of social indices upon attendance. Gidlow (2006) examined the same dataset as the current study in relation to area indices. He found that participants from more deprived or rural areas were less likely to be contacted or allocated to a leisure provider by the CRM. Indicating that participants from these areas had greater barriers to overcome. Barriers for a rural population were also explored in a study of the factors that affect uptake of cardiac rehabilitation services (Harrison & Wardle 2005). They reported that the main barriers to utilising services were to do with access (public transport, parking, time and location of classes) (Harrison & Wardle 2005). This provides an additional explanation for increased likelihood for some participants to access or exit the ProActive PARS.

Individual and social environmental determinants are thought to outweigh the role played by physical environmental determinants of achieving beneficial levels of physical activity (Harrison & Wardle 2005), since the exercise

professionals that deliver and facilitate physical activity are more important for facilitating support and enjoyment (Bray et al 2005; Wankel 1993; Winninger 2002 2003) (Section 3.1.3 and 3.2.4).

7.1 Conclusions

The findings of this study highlight how accessing physical activity via PARSs is a complex process. Referral is dependent on a number of factors including the patient consulting a health professional in order to be in a position to be targeted, their health professional recommending physical activity to them and the patient being genuinely ready to take up physical activity. The findings from the Models build up a picture of the participants journey through PARS processes and in turn assists us in deconstructing the facets of the scheme, this deconstruction allows us to understand more about why some participant characteristics and some scheme facets are more influential than others on attendance. It appears that those that are most likely to access the scheme (Models 1 to 3) were women, referred by a GP, nurse or physiotherapist with cardiovascular disease. While those participants most likely to complete the scheme were men and/or older participants. Overall the scheme was most suited to participants referred with cardiovascular conditions, that were older and that had been referred by a GP, nurse or physiotherapist, as they were more likely to both access and attend the ProActive scheme, this is discussed further in the following Sections.

The findings of the current study and that of Gidlow (2006) were fed back in order to improve the ProActive PARS. The implications of these scheme improvements were discussed with the Coronary Heart Disease Prevention Manager, three months after being implemented (Kweatkowski 2006), and also discussed in the following recommendations.

7.2 Implications for Practice

7.2.1 The potential role PARS have in primary care

Although physical activity has an important contribution to make towards health (Department of Health 2004a; Department of Health/DCMS 2004a) previous evaluations of PARS have often focussed on the lack of population impact of schemes (Riddoch et al 1998). Rather than acknowledging the important role

they can play in introducing an enjoyable physical activity experience (Crone et al 2004; Hardcastle & Taylor 2001; Singh 1997; Stathi et al 2003) to groups that need expertise and support.

7.2.2 Effectiveness of PARS for some participants

The current scheme findings indicated that 65% of participants started physical activity with a leisure provider and that 32% attended more than 80% of their planned physical activity sessions (Section 4.2). Therefore PARS can be effective for some people, in particular, the success of older participants in the current study demonstrates what is possible for those that managed to progress through the scheme.

7.2.3. Increasing participant progress within PARS for individuals known to have a limited progression history

Obesity/overweight, mental health, musculoskeletal and 'other' referral reasons were consistent determinants of not progressing through the scheme. Signifying that if the current PARS model is to meet the needs of the target groups identified by the Government (Department of Health/DCMS 2004a) greater support needs to be offered from point of referral. In light of both the time wasted by the large number of participants that do not attend appointments with leisure providers, and the success of the scheme for those that do access physical activity by attending their initial appointment with a leisure provider (Section 6.2.3 and 6.2.4), the findings of the current study identifies the determinants that are associated with a lack of progress through the scheme. These could be used by public health to target those participants with more strategic and organised support, which could be provided by Healthy Lifestyle Co-ordinators and/or Health Trainers.

7.2.4. Health professionals assessment of participants

The large amount of participants that do not access the scheme, points to inadequate assessment of their readiness to change by referring health professionals. Health professionals limited consultation time and lack of

knowledge may explain participants' lack of progress through the scheme and non-attendance with a leisure provider. It may be pertinent to argue that assessing participants' readiness at point of referral by health professionals may reduce the number of participants that failed to attend. Which would reduce the time wasted by those that have no intention of attending their initial appointment with leisure providers. Following recommendations to the scheme, referral forms were developed (Appendix 8) to incorporate a 'tick box' assessment, to prompt health professionals to assess if their patient is motivated to take up physical activity, additionally another 'tick box' assesses if the patient meets the scheme inclusion criteria, in order to cut down on time that assessing these individuals and corresponding with health professionals took (Section 8). This system could be adapted and implemented by other PARS and physical activity interventions.

7.2.5. Leisure provision for physical activity

Due to the population groups older and/or men that were more likely to complete. Although leisure providers offered a variety of physical activity sessions, they mainly occurred within leisure centre settings and there were few sessions set up for target groups (e.g. falls prevention). Implications for practice of this study and of Gidlow (2006) have resulted in a model that will, in the future, offer a greater variety of physical activity and healthy lifestyle options to referred and self selected participants, by connecting existing services and gradually adding further ones to meet local needs, through the use of HLC as conduits to them. A further recommendation would be to increase leisure providers knowledge of the facets that influence enjoyment and participants continued attendance, and monitor the services and physical activity sessions they offer, through interviews and/or questionnaires (qualitative methods), in order to compare the experiences of participants that attend and those that drop out in order to ascertain why and develop services.

A recommendation for practice, considering that older participants are also the most dominant group, would be that physical activity is targeted at specific groups that identify with each other. The predominance of this group has lead to the development of falls prevention sessions and the future development of

new scheme participation for older people (POPP), which will be accessed through the healthy lifestyle officers.

7.2.6. Data collection

Data collection of the current scheme was embedded into scheme processes. In order to provide robust data that is not reliant on memory recall, for the comparison of schemes and build up a picture of scheme process characteristics are least and most effective, data collection needs to be a part of day to day scheme processes. It could be beneficial for ongoing monitoring and scheme development by providing information about PARS processes and participant progress through the scheme, to continually develop schemes. As the development of evidence based practice is important for the improvement of PARSs.

7.3. Implications for policy

7.3.1 Policy needs to recommend population cohort studies for PARS

These findings illustrate the strengths of population cohort studies for investigating PARSs, through their rigour and retention of ecological validity, so it is possible to assess the facets that make these schemes unique. This challenges NIHC's recommendations (National Institute for Health and Clinical Excellence 2006a) for health professionals to only use PARSs that are only a part of controlled studies. Study designs that retain the ecological validity of PARS, such as population cohort studies should also be recommended.

7.3.2. Recommendation of PARS by specific GPs that are known to be successful referrers

The findings illustrate that GPs both refer the majority of participants and their recommendation influences participants' progress through PARSs. Most effective referring GPs could be identified and policy could propose that they recommend physical activity and PARSs to their patients.

7.3.3. Policy needs to acknowledge specialised service that PARS delivers

Much of the recent guidelines regarding PARSs (Department of Health 2001a) and physical activity for health (Department of Health 2005), advocate PARSs as a panacea for all ills (Dugdill et al 2005). The introduction of health trainers (Department of Health/DCMS 2004a) may be an acknowledgement by the Government of the need to promote physical activity in different ways to the population. While PARSs need to be recognised for providing a specialised service, set up to meet their individual local needs.

7.3.4. Quality assurance of PARS

The assessment and continuing professional development of the ProActive scheme processes, has ensured a safe environment for participants with knowledgeable, qualified exercise professionals (Section 3.2.3) (Crone et al 2004), unlike pseudo schemes set up for research. This highlights the importance of using established schemes when researching PARS, particularly in light of recent research of their holistic value (Crone et al 2005c; Harrison et al 2005a) and literature review (Gidlow et al 2005). Although the DoH set out guidelines for PARS to improve standards (Department of Health 2001a) there has not been an audit to assess the impact of this document.

7.4 Implications for research

7.4.1. Access

Currently, there is limited research examining the reasons why individuals that are referred do not access physical activity, and in turn why these individuals agree to start physical activity but still do not access the scheme. Using qualitative methods to investigate participants' perceptions will help to develop ways to improve access.

7.4.2. Physical activity delivery

In the current study due to scheme development leisure providers were categorised according to scheme management. Which did not allow for more of an exploration of the characteristics of scheme processes and of physical activity delivery by leisure providers (Sections, 6.2.4 and 6.3.6). An investigation perhaps using qualitative methodology of the impact upon participants of leisure facility in comparison with community physical activity may assist in understanding the differences between the approaches and which participants characteristics are related to preferences.

7.4.3. Micro processes of physical activity delivery

In order to understand the impact of physical activity, future research that deconstructs processes and categorises physical activity delivery will help to understand which facets (programme price, facilities, type of exercise professional, group or lone sessions, support mechanisms) have the greatest impact on access and attendance (Sections 3.2.4, 6.2.4 and 6.3.6). It might be useful to explore ways of categorising leisure providers according to processes surrounding how physical activity is delivered and organised. It may also be helpful to understand participants' experiences further and explain the findings in relation to leisure provider processes.

7.4.4. Reliable outcome variable

The use of a quality outcome variable such as attendance data taken from leisure providers records, as used by the current study, provides a much more reliable outcome than self reported physical activity, on which to draw inferences regarding attendance.

7.5 Summary

This study is the first to explore the impact of scheme processes upon participants journey through PARS, and the contribution of scheme processes

upon participants' use (attendance) of PARS. This study uses cohort data and marks a move away from previous research designs used to evaluate PARS.

Although PARS are not the answer for public health, and the population level behaviour change needed, they should be acknowledged for providing a supported introduction to physical activity for specialist populations and as this study found, can be successful mediums for targeted groups of individuals to accomplish regularly attendance to a physical activity programme over a period of time.

8.1 Introduction

This thesis is primarily quantitative, yet I do not think that it completely encompasses the personal level of knowledge and learning generated from this experience and the impact of this knowledge on my interpretation of the results. Therefore, it is important to offer a qualitative reflection of my own experiential based on my dual roles of researcher and project worker.

Reflective practice involves 'turning the problem upside down' (Schön 1987: p.12). It is a process through which practitioners develop a deeper understanding of their practice by assessing their tacit knowledge, and taking steps to improve it. Tacit knowledge is practical knowledge, which is very personal and is constructed by the individual, being made up of social norms, values, prejudices, experiences and sources of knowledge, including personal, scientific, aesthetic and ethical (Gibb 1988; Schön 1987). It is important to acknowledge these factors as they inevitably influenced the final thesis.

Reflection is an important part of personal and professional development (PPD) (Wilkinson 1999), as it involves learning through practical experiences. This involves describing what happened, the feelings associated with it, evaluating what was good and bad about the experience, and analysing it to make sense of what happened. I used the cyclical model of reflection proposed by Gibb (1988).

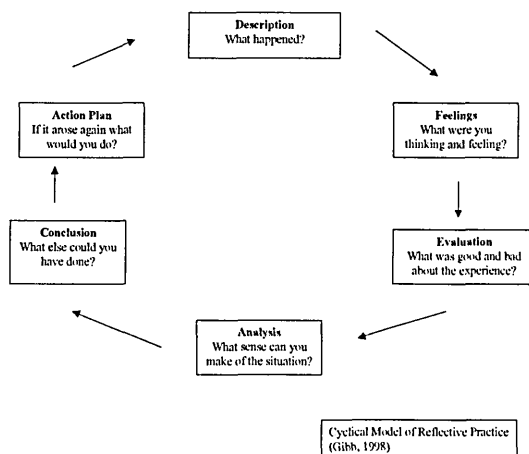


Figure 8.1 Gibb's cyclical model of reflective practice (Gibb 1988)

My personal reflections of how the roles of project co-ordinator and researcher have emerged clearly demonstrate how the research process itself has informed changes in my own practice and led to the development of the ProActive role as it stands today. By highlighting some of the difficult areas I hope to offer an insight to my own process of learning, adaptation and change in the following sections.

8.2 Experience as the project worker

Initially I felt I had a good theoretical and practical foundation of exercise guidelines for medical conditions (ACSM 1997), but limited knowledge of the processes for implementing the project worker role. This despite having carefully thought about the role in preparation for the recruitment process. Representing my colleagues felt daunting, partly because of the geographical distance and the need to appear professional, despite working from home and as a result I also felt very isolated. Isolation is a key theme throughout this research work and something I personally found problematic, which I will return to later. Support and reassurance from my colleagues during this time was comforting, as it felt as though the success of the project rested firmly on my shoulders.

8.3 Development of project worker roles

As I managed the different demands of the project worker role, the depth of work increased as I took some of the consultancy and leisure provider support, delivery of some workshops, and generating figures for the quarterly report. Systems were developed to assist in managing these roles, particularly the largely administrative parts of the CRM.

8.4 Central referral mechanism

Initially I meticulously prepared for my first calls. Risk stratification was initially particularly stressful and problematic, as the exclusion criteria had not been initially defined and GPs did not like their referrals questioned. However, no

amount of preparation is like the real thing and as I made calls and as my confidence grew, I developed my own approach so the data collection appeared more routine and less like a list of demands. During this initial period of working and calling participants I was so focussed upon these aspects of the CRM role that I spent most of the time collecting data rather than giving participants the space to voice their barriers and motives. Increased knowledge and the development of criteria improved my confidence when risk stratifying and improved my ability to deal with referred patients and health professionals. Much of the time this was rewarding, due to resolving difficult problems and finding solutions that suited all parties. I often found myself doing less pressing jobs from my list and putting off the more challenging ones.

Having knowledge about physical activity services for higher risk clients throughout Somerset was very useful, as it eased the ethical dilemma of withholding physical activity that would be beneficial to some higher risk individuals. For example, information about Phase III cardiac rehabilitation, Mineral Hospital (Bath) for rheumatoid arthritis and Chronic Obstructive Pulmonary Disease (COPD) rehabilitation. This provides a good (albeit unintended) example of the benefits of a model of joined up community physical activity opportunities.

8.5 Pressures of delivering a contract and conducting research

Before the studentship started I was starting to find the project worker role increasingly tedious and stressful, mainly due to its repetitive and largely administrative nature. The thesis provided me with different insights into the scheme (discussed later). When I started my thesis I resented the amount the contract impinged upon my time to spend on researching my thesis. In an ideal world, passing on the more mundane administration of this kind to an administration assistant would have freed up time.

8.6 Dealing with isolation

Reflecting now on the project worker role and research process, it is clear to me that I struggled with the level of isolation involved in this work, in a literal

sense, as my nearest colleagues were 2 hours away in Cheltenham and on a more psycho-social level, I had no-one to identify with. Since there was no on-going formal network of peers apart from when I engaged in formal training or met with colleagues, this meant is that I only had myself to compare, motivate and plan. Continuing professional development, helped with this as it provided me with social contact with people from similar working backgrounds and interests. It was particularly important in developed my listening and communication skills and external social interaction.

From my personal experience I found that when I was struggling with a particular concept, discussion with others enabled me to move on from what felt like a stuck position. Whilst I recognise that a research degree does require a great deal of isolated working and self discipline, I do not feel that the enquiry involved in this type of research lends itself to solo working. My view now is that some sort of on-going formal peer structure or being located on a site near others would have enabled me to structure the research in a systematic fashion and assisted with swift formulation of my arguments.

8.7 Self-management

Working from home throws up many challenges. I found getting into a routine and creating structure is key. But due to the need for flexible working and isolation it was easy to let this structure slip. I found that having time commitments partitioned my time and my manager motivating through her regular contact, checking on progress and providing support. For more successful working it might be better to locate this work within a structured environment, with flexible working hours for evening CRM work.

8.8 Asking for help

Although I asked for some support during this time I was reluctant to do so. This was due to a mixture of pride, distance and I felt it was my responsibility to sort out things myself, particularly as the contract was a small part of my colleagues jobs. Similarly, I often found myself avoiding facing 'stuck movements', which held up my research process. I had overcome this before

in my college working by calling a friend when I was procrastinating. In hindsight, perhaps if I had asked for more support during this time, it may have assisted both my working practices, built up a better rapport with my colleagues and supervisors and finally helped me to clarify my research arguments.

8.9 Time Management

The pressure of time due to juggling both contract work and research, were increased by empathy of peoples' situations, combined with the isolation of working from home caused a conflict, particularly when contacting older participants that were, like me, also isolated and also just really wanted to have a conversation with someone. However, these conversations sometimes provided vital information, for example, of new symptoms, related to unstable angina, that they had not thought to relay to their GP.

8.10 Management of key personnel

Managing my supervisors and the conflict of their roles as my established line managers, colleagues and research supervisors, was at times awkward and constructive. It was partly because of this that it took time for me to take ownership of my own thesis.

8.11 Writing

I often found myself getting stuck on parts of my thesis. My awareness of the time and work pressures of my supervisors and need to be self-reliant prevented me for asking for help. Initially I would stagnate at these points, which I found frustrating. I found that using flip chart paper and mapping out the points and their arguments helped me to see the bigger picture and move my thinking forward. I used this technique to help devise the best ways to categorise the variables for logistic regression analysis (see Sections 4.1. and 4.2). Meetings with supervisors and resulting discussion with them regarding these issues also helped to resolve them and move my thinking and thesis forward. It would have been better perhaps to contact my supervisors more

often when these issues arose to prevent stagnating and keep my thinking moving forward.

8.12 Preparation of data

The quantitative analysis undertaking in this study was initially conceived to be the first part of a two-part PhD study, with the first part assessing the impact of scheme processes. This was initially envisioned to be a starting point for the second study, which I was really interested in, which was to be a qualitative analysis of participants experiences of scheme processes in order to add meaning to the initial findings. When it became apparent that I was not going to be able to conduct this study I was very disappointed and had to adapt my thesis approach. However, I think that I have examined the data more extensively than I might have had I been continuing onto another phase.

The different requirements associated with dealing with the large dataset were far more time consuming and involving than anticipated (see Section 4.2). Not only was cleaning and involved missing data a massive undertaking, but the importance of finding a data analysis tool that not only suited the data being analysed but also answered the research questions was crucial. I found myself becoming obsessed with ensuring that the technique being used was correct, as it dawned on me that the quality of my results and in turn the entire thesis hinged on it. Logistic regression was thought of early on, but it was only when exploring other analysis tools that I was satisfied that logistic regression met both the needs of the data and the research question. This was finally confirmed in meetings with researchers that had a full understanding of logistic regression, Dr Charlie Foster, Oxford University who regularly used logistic regression and statistician Professor Claire Morris, University of Gloucestershire.

Due to the numbers of categories and small amount of data, my data analysis would not have meaning if I did not categorise the variables, which needed to be in a way that was in keeping with the research question (see Section 4.1). I started off with mind maps on flip chart paper to tease out the meaning of the variables and undertook lengthy research in public health, health policy,

physical activity and leisure research in order to select which categorisations most represented the processes of referral and the doctrines of the thesis (see Section 4.1) and also whether they were practical. I found the support and feedback of my supervisors during this time was really reassuring and gave me confidence that the categories that I had used were in keeping with the thesis. This process assisted me in moving things on with interacting with supervisors.

8.13 Strength of thesis

My prior experience of the ProActive scheme had been as a scheme coordinator, which helped me understand the limited time leisure providers had to complete paperwork and administrate schemes. It also provided an insight into the impact of the exercise professionals and scheme staff on participants' experience of physical activity and continuing attendance.

8.14 Project worker involvement

Researching and working on the contract gave me valuable insight into how policy and other studies related to the scheme, and the reasons and excuses that participants give for not taking up referral. This provided me with unique insight into scheme processes having been an integral part of them. As a project worker I dealt with referring health professionals, referred participants and leisure providers on a daily basis.

This experience provided me with valuable anecdotal understanding of the findings, for example, barriers for being physically active being greater for participants with mental health or weight loss/obesity referral reasons due to embarrassment and social norms and their perceptions of the leisure centre environment. The regard older participants had of their GPs opinion. Other issues were barriers caused by the physical activity session times offered by leisure providers being mainly during working hours, problems for many of being too ill to work and not having an income to pay for scheme. Also, many participants did not attend with leisure providers despite being keen during their conversation with me to take up and start being physically active. This may be due to social desirability, as I also inputted many of the client records returned

by leisure providers this helped me to see that my technique of discussion of their referral for physical activity was not that effective, mainly due to my enthusiasm for physical activity to cure all ills and try it out was not much good if the person was not ready. This is illustrated by the following summary taken from the database:

Debbie, (Obese, 4542, 67 years, non-attender), 'Feels must lose weight to help improve fitness as well. Feels should be on a diet as well. Loves sweet things, so is cutting out sugar. Does not have much money, would like a home programme (I'm hoping she will like the look of it so much that will join).'

I started to use some of the brief motivational interviewing to allow participants the option of not taking up physical activity to reduce the number of participants that did not attend with leisure providers.

8.15 Referring health professionals

It became evident that lack of time and priorities for other types of health promotion and disease prevention were amongst the barriers for health professionals to use the scheme there were many inappropriate referrals and many participants stating that they had asked their health professional to refer them due to a recommendation by a friend or relation. Plus their selection criteria and knowledge, not referring participants that they perceived not able to afford the scheme and a lack of understanding of which participants the scheme would most benefit was evident from discussions with them.

8.16 Leisure providers

My ongoing support work with leisure providers provided knowledge into the problems and impact of staff turnover upon the scheme and participants, feedback from participants confirmed this. Some schemes suffered more than others, this was usually due to a lack of support of the scheme by leisure centre management. Being able to freeze these schemes and inform local Government officers provided additional support and exerted pressure on leisure centre management to resolve situations quickly.

8.17 Literature review

Much of the thesis has been held up by my lack of confidence in my writing. I found literature reviews difficult, particularly initially when I was finding my way through the research to formulate clear arguments for my approach which was not fully formed, this led to insufficient structure and criteria for the review. I now see this as a valuable process, but at the time, I found it very frustrating, due to the tangents that exploration created and need to have a broad understanding to provide focus, it is easy to become engrossed in the small detail. My chapter regarding evaluation in health promotion is a good example of this, I was unable to see the bigger picture and distance myself from arguments surround methodological approaches, it was not until I went to a summer school and discussed the area with others that the themes arising in the area became clearer (Boaz 2006).

8.18 Becoming a researcher

Having worked with my supervisors for a few years, it was difficult to move from my role of managed project worker to self-managed researcher. This also impacted on my ownership of the thesis. My confidence grew when I defended by rationale for my research questions and when I came up with ways of categorising referral process variables. Initially the constructive criticism from my supervisors knocked my confidence and I found it difficult to take positively. I am now able to see this as valuable part of my development as a researcher. Due to the time constraints of having dual roles of project worker and researcher, and my poor time management, much of the time I felt like I was neither a good researcher or project worker.

My interests initially when embarking on the thesis were in physical activity and health. My viewpoint was skewed from working on the scheme and I thought that PARS were the answer for public health. Initially I had wanted to explore the valuable experiences of participants that I had been speaking to for 3 years. I found evaluating cohort data using logistic regression analysis, which is completely different to previous traditional PARS evaluations, has broadened my understanding of the strength of quantitative approaches and ways that

these methods can answer more diverse research questions and in turn retain the ecological validity of the intervention they are evaluating. I now have a much greater appreciation of the wider implications of physical activity for public health. In terms of the need for greater impact upon the population through the development of physical and social environments that support increased physical activity, the broad impact of Government policy and recommendations for practice, and the role this has to play in putting in place mechanisms to encourage the population to increase their physical activity levels. This has lead to a change in my view of PARS in relation to public health over the course of the study, they do have a role to play in meeting the needs of some specialist groups, and should be offered as part of many different community physical activity options. Undertaking the research also increased my appreciation of my project worker role and improved my working practices.

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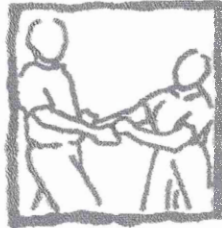
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Glossary of terms

Arthritis	Degeneration of joint cartilage
Attendance	Relates to the amount of times participants attended sessions with leisure providers out of the amount that they planned to attend, this is usually twice a week. It also relates to the amount of the referral scheme experienced by the participant.
BACR	British Association of Cardiac Rehabilitation
BASES	British Association of Sport and Exercise Scientists
Cardiac rehabilitation	Health promotion and supervised physical activity sessions following heart attack or heart bypass
Central referral mechanism (CRM)	a Microsoft access database that tracks the progress of all participants from initial point of referral and onwards.
Cohort	Population
CHD	Coronary Heart Disease also called ischemic heart disease
Cross-section	Relates to research design, refers to studies that look at a moment or slice of time.
GP	General Practitioner
Health professional	Relates to primary care health professionals, such as doctors, nurses, physiotherapists, dieticians, psychiatrist, smoking cessation officers.
LEAP	Local exercise action pilots, aims to contribute to increasing the evidence base and identifying best practice.
Logistic regression	"Allows the prediction of a discrete outcome, such as group membership, from a set of variables that may be continuous, discrete, dichotomous, or a mix" (Tabachnick & Fidell, 1996: p. 575)
Longitudinal	Relates to research design, refers to studies that followed participants for a length of time and took measurements over this period to show changes.
NSF	National Service Framework, Department of Health outlined standards and targets of service delivery for different target populations
PARS	physical activity referral scheme, also called exercise on prescription, exercise referral or GP referral by other studies.
PCT	Primary Care Trust, oversee primary care services, such as GP
Project Worker	The interdisciplinary exercise scientist which operates the CRM.

	rigorous evaluation method and used widely by medical research.
Referral	Health professional recommends physical activity referral scheme to their patient and completes a form.
Referral reason	the reason given by the referring health professional for recommending their patient for physical activity.
Referring health professional	A health professional that recommends physical activity via a PARS to their patient
Rheumatoid arthritis	inflammation of joint membrane, condition fluctuates with irregular flare-up (attacks)
Scheme processes	Are the differentiating factors of the scheme that participants travel through, these are: referring health professional, project worker, and leisure provider.
SPAG	Somerset Physical Activity Group, is a multi-agency alliance, which was established in 1993, and operates at both a strategic and policymaking level. SPAG has the aim of providing a co-ordinated approach to physical activity promotion at a countywide and local level, and was linked to the Somerset Specialist Health Promotion Service (SSHPS)
Uptake	Relates to starting scheme, by agreeing to

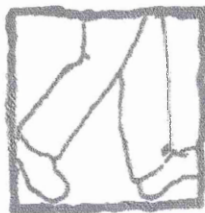


Somerset Physical Activity Group

‘ProActive’

LEISURE PROVIDER RECOGNITION SCHEME

Portfolio



How to use this portfolio

Before developing a portfolio for application, the 'Guide to Leisure Provider Recognition Scheme' should be read.

To assist with the completion of this portfolio, pages that give information are red and pages which are to be completed by the applicant are white (white pages can be photocopied if more space is required). The template portfolio is divided into the following sections:

1. Leisure Provider Details
2. Administration
3. Staffing
4. Facilities
5. Physical Activity Plan
6. Health Promotion
7. Links with the Referring Health Professionals
8. Phase IV Cardiac Rehabilitation
(Only to be completed if cardiac rehab is to be included as part of the ProActive scheme.)
9. Renewal of Recognition
(Only to be completed when reapplying for recognition after the initial three years.)
10. Statement of Agreement

There are a number of steps requiring completion within each section, which must be followed to ensure a complete application for recognition status:

- . Using the guidance notes within each section, provide a typed explanation to address each of the identified criteria, this should be inserted into the appropriate section. These guidance notes, seen alongside each criteria, provide an outline of the *minimum* information required. Please address these criteria when completing your typed explanation.
- . Each section contains a list of supporting documentation which should be included into the section. Indicate which documents have been inserted by ticking the appropriate boxes on the list. Please indicate on the list any other supporting documentation which has been included.

Where should this portfolio be sent once it has been completed?

Please send **four copies** of the completed portfolio to:

Irina Kweatkowski

Health Promotion Manager - Coronary Heart Disease

Health Improvement Service

Taunton Deane PCT

Wellsprings Road

Taunton

Somerset TA2 7PQ

Tel: 01823-333491

Section 1. Leisure Provider Details

Leisure Provider Details

Leisure Provider name:

Leisure Provider address:

.....

.....

.....

Postcode:

Telephone:

Fax:

E-mail:

Proactive Scheme

Coordinator's name:

For Office Use Only

Date application received:

Date of assessment visit:

Assessment team: General Practice

Health Promotion

Exercise Science

Leisure Management

Invoice sent:

Certificate dated: From: To:

Annual review visits done:

.....

Date of assessment for Phase IV Cardiac Rehab :

Lead Assessor

Cardiac Rehab

Section 2. Administration

Criteria	Guidance Notes
A1 All records should be held in strict confidence.	Provide an explanation of procedures put in place to ensure that client confidentiality will be maintained at all times. Assessors will ask where client records are kept and in what format they are maintained.
A2 Leisure providers must be able to demonstrate evidence of clear and accurate administration procedures.	Demonstrate evidence of clear and accurate administration procedures which include appropriate booking systems and the ongoing tracking of client's progress.
A3 All leisure providers must participate in the ongoing collection of data to monitor the progress of the scheme. This must include records showing uptake and adherence.	Leisure providers must contribute to the ongoing collection of data needed to monitor the progress of the scheme as directed by Taunton Deane PCT Health Improvement Service. Leisure providers must demonstrate an understanding of this data collection and must be able to show how the collection and submission of this data to Taunton Deane PCT Health Improvement Service will be incorporated into the scheme.

Section 3. Staffing - Criteria marked with * are only applicable for leisure centres applying for recognition status

<i>Criteria</i>	<i>Guidance Notes</i>
<p>S1 All leisure providers must identify a named Physical Activity Referral Scheme Coordinator. The Coordinator must hold appropriate recognised qualifications. Where appropriate, all Proactive Scheme Coordinators must be:</p> <ul style="list-style-type: none"> • Covered by recognised indemnity insurance, <i>and either:</i> • Registered on the Register for Exercise Professionals (REPS) at Level 3, <i>or</i> • A member of a relevant professional body. <p>Particular attention should also be paid to communication, administration and networking skills.</p>	<p>The Proactive Scheme Coordinator is responsible for the overall running of the scheme and the quality of service and programmes provided. They are also required to provide a consistent level of support to patients and provide the links between practice medical staff, other activity staff (if appropriate) and clients.</p> <p>Provide a curriculum vitae for the Proactive Scheme Coordinator - this should include qualifications gained, vocational training, membership of professional body, indemnity insurance cover (if appropriate), relevant skills and experience. Dates when qualifications are gained and expire should be included.</p> <p>A detailed explanation of the role of the Proactive Scheme Coordinator within the proposed scheme must be provided, including their primary responsibilities and position within the organisational structure (if appropriate).</p>
<p>S2* All activity/session leaders are required to hold appropriate recognised qualifications. All staff involved must be a member of a relevant professional body and be covered by recognised indemnity insurance. Where appropriate, each activity leader should be</p> <ul style="list-style-type: none"> • a member of a relevant professional body • covered by recognised indemnity insurance. • Registered on the Register for Exercise Professionals (REPS) at Level 2 or above. 	<p>Provide a diagram showing the structure of staff involved with physical activity referrals.</p> <p>Provide a brief overview of each member of staff involved with the scheme (<i>excluding the Coordinator</i>) - this should include qualifications gained, vocational training, membership of professional body, indemnity insurance cover (if appropriate), relevant skills and experience. Dates when qualifications are gained and expire should be included.</p> <p>Provide a detailed explanation of the main roles and responsibilities of each member of staff involved and how communication will be maintained within the team.</p>

<p>S3 Staff involved in the scheme must hold a current recognised first aid certificate or have direct access to qualified first aid staff and appropriate facilities at all times.</p>	<p>Provide an explanation of how appropriate first aid will be available at all times.</p>
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Section 4. Facilities

<i>Criteria</i>	<i>Guidance Notes</i>
F1 Operators should make use of a variety of physical activities and facilities on the referral programme.	Provide full details of all facilities to be used within the programme. This should include details of first aid facilities.
F2 Equipment used on the programme must be maintained on an ongoing basis and be safe to use at all times.	Provide details of how equipment will be checked regularly as part of the responsibilities of staff involved in the scheme. Provide an explanation of the procedure in place to report faulty equipment (if appropriate).

Section 5. Physical Activity Plan

<i>Criteria</i>	<i>Guidance Notes</i>
P1 An informed consent form should be completed and held for each client.	Provide an explanation of how an informed consent form will be used as part of the referral process.
P2 Operators will be expected to conduct a lifestyle assessment for all clients.	<p>The lifestyle assessment should relate to the underlying motivation of the client and their perceived/desired objectives. Short and longer term goals should be agreed during this assessment.</p> <p>Provide an outline of the areas which are to be covered in this assessment and how they will be recorded. Please also provide an explanation of how the information collected will be used to develop the physical activity plan and how it will be monitored.</p>
P3 A detailed physical activity plan must be provided in a suitable format for each client. The plan must last a minimum of twelve sessions over at least six consecutive weeks.	<p>This plan should be developed using frequency, intensity, duration and type of activity and must take into account future progression of the activity. All plans should also include an element of increased physical activity built into everyday life which can be done in or around the vicinity of the home.</p> <p>Leisure providers should include an example plan with an explanation of when, where and how appropriate mid term reassessment/ monitoring and the end of plan assessment will take place.</p>
P4 Operators are expected to support and encourage clients to complete the period of referral.	All clients who have not attended supervised sessions for three weeks, with no prior notice should be followed up by telephone.
P5 A continuation physical activity plan must be agreed with all clients. All clients must be followed up three months after the referral period.	Provide an explanation of how the development of a continuation physical activity plan will be built into the referral period. Provide an explanation of how clients will be followed up after three months.
P6 All clients must be followed up six months after the end of their referral period.	All clients should be phoned at six months to offer further advice and support to continuing physical activity. This contact should be monitored on the tracking form.

Section 6. Health Promotion

<i>Criteria</i>	<i>Guidance Notes</i>
<p>H1 The initial lifestyle assessment conducted on all clients must be able to identify primary lifestyle issues. Any issues which are noted in the initial assessment should be reviewed within the duration of the programme.</p>	<p>Lifestyle assessment must be able to identify;</p> <ul style="list-style-type: none">- high levels of alcohol consumption- if the client is a smoker- healthy eating habits- if high levels of stress are a problem for the client <p>Provide an explanation of how the above lifestyle risk factors are identified during the assessment.</p>
<p>H2 All staff named on the application for recognition must be aware of the importance of the four main lifestyle issues and must be able to give basic advice on the effects of such issues on health when appropriate.</p>	<p>Provide a summary which identifies how lifestyle advice will be incorporated into the referral scheme. During the assessment, leisure providers will be asked to summarise the key messages for each lifestyle issue and identify at what point it would be appropriate to seek specialist help or support.</p>
<p>H3 Staff should be able to demonstrate a knowledge of further available sources of support and information on lifestyle issues.</p>	<p>Provide an outline of;</p> <ul style="list-style-type: none">- potential sources of further information on lifestyle risk factors for exercise leaders to make use of.- other sources of support/specialist advice which could be offered to clients if appropriate.

Section 7. Links with the Referring Health Professional

<i>Criteria</i>		<i>Guidance Notes</i>
L1	All Coordinators are expected to have a direct line of communication with the referrer or a representative of the clients medical practice.	Provide a list of potential local practices and/or health professionals. Explain how contact will be initiated and maintained with appropriate health professionals
L2	On completion of the referral period, a report must be sent back to the referrer from the leisure provider.	The report should be of an appropriate format and contain information regarding the progress of the client during the activity referral and an outline of the agreed continuation physical activity plan.

Section 8. Cardiac Rehabilitation

(This section should only be completed by those leisure providers who are including Phase IV Cardiac Rehab in addition to their existing scheme)

Criteria	Guidance notes
C1 Leisure providers must have a clear plan of how Phase IV will run in addition to the existing ProActive scheme.	Provide a detailed explanation of how Phase IV will be operated within the ProActive scheme. Information (either a paragraph or in a flow diagram) on how a patient will be referred from Phase III to IV must be included, in addition to the protocol to be followed in the event of their drop out either through a lack of adherence or through a deterioration of their physical condition.
C2 Provide a list of potential referrers. Explain how contact will be initiated and maintained.	Effective links must be established and maintained with Phase III professionals and nominated CHD Primary Care nurses. Provide information on how these will be maintained and how, in the event of patient drop out detailed in C1 above, contact will be made and information shared. Clients must only be accepted onto the scheme if sufficient information has been received from the referrer, to enable risk stratification of the client. This would normally be the ProActive referral form and a completed BACR form.
C3 The lead instructor must hold appropriate recognised qualifications. These may be either: - BACR Phase IV qualification, or - Equivalent qualification (e.g. ACSM Exercise Specialist)	The lead instructor is responsible for the overall running of the Phase IV classes and the quality of service and programmes provided. Details of qualifications gained and relevant experience should be included. Where possible another BACR qualified instructor must be named to cover leave/sickness. The session must be cancelled if this cover cannot be found. A clear explanation of how this will be managed within the scheme is required.
C4 Appropriate staff to client ratios must be maintained. Activities must be suitable for the client group. A second person must be available in the building to provide emergency support.	Provide an explanation of how an appropriate ratio of staff to clients will be maintained. In accordance with BACR guidelines, this should be no more than 1 to 15. Explanation of the variety and type of physical activities available to clients on the Phase IV scheme need to be detailed with appropriate ratios for each activity and venue, where necessary. Evidence of a clear action plan of emergency procedures must be demonstrated. In a Leisure Centre, an additional member of staff must be present in the building to provide emergency support. <i>Continued overleaf</i>

<i>C4 cont.</i>	For individuals running community based schemes, a second person trained in basic life support skills must be available to provide emergency support. This could be an instructor, volunteer, or class participant. Provide an explanation of who this person is likely to be, how the coordinator intends to recruit them and how they and their role will be introduced and made known to other participants. Community facilities must have access to a reliable mobile or land telephone line. Provide details of how emergency services could be contacted, if required.
C5 All staff must hold the current basic life support certificate.	It is recommended, but not a requirement for recognition, that Leisure Providers should have access to a defibrillator and undertake appropriate on-going staff training to support the use of the defibrillator. If a defibrillator is available for use, evidence of qualifications and on-going training must be provided.

Section 9. Renewal of Recognition

(This section should only to be completed by those recognised leisure providers who are reapplying for recognition)

Criteria	Guidance notes
R1 At reassessment, leisure providers must have formed and be working towards a three year development plan to progress the Proactive Scheme. This should be based on data collected from ongoing monitoring of uptake and adherence (see A3).	The three year development plan should include: <ul style="list-style-type: none">- extending the services available on the scheme to make use of a variety of activities- integrating the scheme with other services offered both by the leisure provider and the local community.
R2 Ongoing staff development must be demonstrated as an integral part of the Proactive Scheme Development Plan.	The development plan must show: <ul style="list-style-type: none">- that all staff involved on the scheme have attended a minimum of two ProActive workshops per year throughout the recognition period.- a commitment to the further development of staff via recognised formal training and qualifications.

18 March 2004

Adrienne Sidford
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BRIDGWATER
SOMERSET TA5 1RB

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Taunton
Somerset
TA2 7PQ

Tel: 01823 333491

Fax: 01823 272710

www.tauntondeane.nhs.uk

Health Improvement Service

Dear Adrienne

Re: PhD study of the ProActive Physical Activity Referral Scheme in Somerset

I am pleased to hear that your PhD will be focusing on a holistic evaluation of the ProActive scheme. This audit will be extremely helpful to the Primary Care Trusts in Somerset, to enable the scheme to develop to meet both the targets required by the Department of Health, as cited in the National Service Frameworks, and their own Local Delivery Plans for the reduction of health inequalities.

I can confirm that you will have access to the data for the ProActive scheme held by the Health Improvement Service on a Microsoft Access 2000 database. I understand that you will require access to this data for Stage 1 of your project. I am aware that the Contract for providing the ProActive Management Service ends in 2005; however I am happy that you are able to access the relevant data for the duration of the evaluation.

I wish you well with your audit, and look forward to working further with you.

Yours sincerely



IRINA KWEATKOWSKI

Health Promotion Manager – Coronary Heart Disease

CC Penny Guppy – Health Improvement Manager

Dr Rebecca Mann
Chair of West Somerset Local Research Ethics Committee
Taunton & Somerset NHS Trust
RDSU
Musgrove Park
Taunton TA1 5DA

24th March 2004

Re: ProActive, Physical activity referral scheme audit

Dear Dr Mann,

I have been advised to contact you by Dr Paul Ewing regarding our physical activity referral scheme audit. In our previous correspondence (copies enclosed), you confirmed that our work did not require a formal submission to the Ethics Committee. We intend to extend our audit to include participant consultation, and I am now writing to check whether or not we need to apply for ethical approval to undertake this work. As explained in my original letter, we record all patient data in the ProActive database. This includes information regarding details of patients' initial referral and results of their participation on the scheme. The extension to the audit will involve two additional projects.

Project 1.

Phase 1 will evaluate the ProActive referral scheme data set (approximately 3500 participants details) in relation to participant demographic details and the processes of the scheme, in order to improve the effectiveness of the scheme and evaluate public health impact. In particular:

- In what ways do certain facets of the referral process and patient demographics relate to scheme attendance levels?
- What can participants' experiences of their journey through the referral process tell us about attendance on physical activity referral schemes (PARS)?
- What are the implications of this for scheme development and public health?

The participants' demographic details (e.g., age, gender, medical condition) and scheme processes (e.g., referring health professional, leisure provider) will be matched with referral outcomes (attendance/non attendance on the scheme). This will allow us to look at whether certain characteristics of participants and processes of the referral scheme have any impact on attendance levels. The proposed extension to Project 1 (Phase 2) will involve follow-up interviews with a sample of participants. The inclusion of participants' experiences of the scheme meets current guidelines by the Department of Health, that call for audits to explore participants' perceptions in order to improve and understand processes and the role these schemes have in improving health (Department of Health, 2001).

The analysis of the qualitative interview data will be facilitated by the use of QSR N-Vivo a qualitative data analysis package (www.qsr.com.au). The Strategy Unit of the Cabinet Office has recently highlighted the need for qualitative research to help service delivery and feedback for future policy (DCMS Strategy Unit., 2003). There are three ethical issues that we feel may be raised about the proposed participant feedback interviews in Project 1.

Firstly, concern may be raised regarding the identification of participants, leisure providers or health professionals from interview material. All identifying information will be changed or removed at the transcription stage to ensure anonymity. All tapes will be secured in a locked filing cabinet in a locked office and will be destroyed upon completion of the project.

Secondly, the Primary Health Care Team may raise concerns about informed consent of participants taking part in interviews. Currently all referred participants are routinely contacted to initiate their physical activity by ProActive Management Service (PMS). In order to take part in the qualitative interviews, all participants will be asked to sign a voluntary informed consent form. All participants (N=18-24) will be fully informed about the purpose of the evaluation, what the interview is about and will be advised that they are free to withdraw at any time without giving a reason for their withdrawal.

Thirdly, concern may be raised regarding where the interviews will take place. All interviews will take place in the participants local leisure centre or within their local primary care setting. None of the interviews will take place in the participant's home. Participants will be reimbursed for any travel expenses they incur. No additional financial incentives will be provided for taking part in the participant feedback interviews. At the end of the interview, participants will be offered further information about local physical activity opportunities in the local area. All interviews will be conducted in accordance with the British Psychological Society and British Association of Sport and Exercise Sciences code of conduct and with the University of Gloucestershire ethics guidelines.

Project 2.

This project aims to evaluate socio-economic and geographical bias in referrals to, and attendance of the ProActive scheme, addressing two main questions:

- Do people referred to the ProActive scheme differ from the rest of Somerset in terms of socio-economic characteristics?
- Do socio-economic and geographical factors influence uptake and adherence to the scheme?

Briefly, the more disadvantaged sections of the population are less active and face greater barriers to becoming active compared with more affluent members of society (Health Education Authority, 1999). Physical activity referral schemes are designed to overcome such barriers and the government guidelines for exercise referral schemes state that they should be 'widely available' (Department of Health, 2001). Anecdotal evidence for GPs in Somerset suggests that this is not the case and that poorer members of the community are being may be under-represented. However, previous research has not explored the socio-economic characteristics of participants referred to PARS, or how this influences scheme attendance and adherence. Furthermore, because Somerset is a largely rural county, access to leisure centres to attend exercise sessions is likely to be problematic for some people. Therefore, Project 2 will include an evaluation of the impact of access to leisure centres.

The same population of participants will be evaluated as Project 1. The ProActive database will be used to extract demographic data, postcode data, and level of attendance for each participant. For socio-economic variables, using postcodes, each participant will be assigned area-level scores for deprivation, housing tenure and car ownership from 2001 census data (www.census.ac.uk/casweb). In addition, a questionnaire (enclosed) will be posted to all participants to enable us to place them into social groups according to individual-level occupation information. In the event of a poor response to the questionnaires, follow-up phone calls are intended to maximise response. These socio-economic data can then be compared to the mean socio-economic characteristics for the rest of Somerset to evaluate bias at the stage of referral and attendance. To explore the potential influence of access to leisure centres, two geographical variables will be examined. Firstly, census data will also be used to classify participants as living in rural/urban areas. Secondly, GIS (Geographical Information Systems) will be used to determine how far participants have to travel to the leisure centre. There are several ethical issues that we feel may be raised regarding the addition of the questionnaire to this project.

Firstly, in terms of content, the occupation-related questions included in the questionnaire were chosen to allow participants to be socially classified by the same schema as used in the 2001 census (Office for National Statistics, 2002), thus enabling comparisons with the rest of Somerset. The additional questions have been included to ensure that the area-level data reflect data at the level of the individual. Subsequently, the questions are very similar to, and no more intrusive than those used in the census.

Secondly, to ensure anonymity of respondents, the unique four-digit identifier assigned to each participant referred on to ProActive of respondents will identify participants who return questionnaires. Only information letters accompanying the questionnaires will include participant names and if returned, these will be destroyed.

Thirdly, we feel that the option of follow-up phone calls is essential. We are particularly interested in finding out who does not attend. Unfortunately, it is likely that these are the people least likely to return the questionnaires. Therefore, to enable the scheme to be modified to target those being missed out, we must make a greater effort to find out who these people are. The accompanying letter will inform participants of the possibility of follow-up phone calls. It is the intention to make a maximum of two attempts to contact people by telephone but participants will be put under no pressure to comply. All referred participants are routinely contacted to initiate their physical activity by PMS and thus an additional phone call can be considered as an extension of this to perform an audit, to which participants consent at the point of referral.

Finally, all participants sign their initial referral forms giving consent for their details to be used in evaluations of the scheme. Informed consent for the use of the additional information obtained through the questionnaire will be obtained through either completion and return of the questionnaire, or by complying with the researcher during follow-up telephone calls. The accompanying letter will provide information regarding the purpose of the questionnaire and the possibility of phone calls to make it an informed decision of whether or not to consent.

Summary

Both projects have the full support of Somerset Specialist Health Promotion Service. We envisage that this work will further support and enhance service planning and delivery. We hope that you still view this work as an audit and wonder if you would be kind enough to confirm that we do not need to put forward a formal submission to the Ethics Committee.

If you have any questions about any aspect of the proposed work, please do not hesitate to contact me for further clarification.

I look forward to hearing from you.

Yours sincerely,

Lynne Johnston PhD, CPsychol
Manager of ProActive Physical Activity Referral Scheme

Enc., Letters of correspondence

References

DCMS Strategy Unit. (2003). *Quality in qualitative evaluation: A framework for assessing research evidence*. London, Cabinet Office.

Department of Health (2001). Exercise referral systems: a national quality assurance framework. London, Department of Health.

Health Education Authority (1999). Physical activity and inequalities: a briefing paper. London: Health Education Authority.

Office for National Statistics (2002). The National Statistics Socio-economic Classification user manual. Version 1. London: Stationary Office.

West Somerset Research Ethics Committee

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SB/ac

20th April 2004

Dr L Johnston
Manager of ProActive Physical Activity Referral Scheme
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Leisure & Sport Research Unit
Oxtalls Campus, Oxtalls Lane
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Dear Dr Johnston

RE: PROACTIVE, PHYSICAL ACTIVITY REFERRAL SCHEME AUDIT

Thank you for your letter dated 24th March 2004 addressed to Dr Mann, former Chair of the West Somerset REC.

Having read the information you submitted, I have concluded that the work, although extended, should still be regarded as a service audit and will not require formal submission to the Ethics Committee.

Yours sincerely



ff
Dr Simon Bolam
Chair
West Somerset Ethics Committee

New codes for referral conditions

IndCo	Condition	Numb	New Cat	New Categories	
1	Angina	1	1	Cardiovascular disease	1
42	Ankylosing/lumber spondylitis	2	4	Overweight and Obesity	2
2	Anxiety / loss of confidence	3	5	Diabetes	3
106	Arthropathy (joint disease)	4	4	Musculoskeletal health	4
6	Asthma	5	8	Psychological well-being	5
107	Atrial fibrillation	6	1	Cancer	6
108	Brain tumour	7	8	Respiratory	7
9	Breathlessness	8	8	Other	8
109	CABG	9	1		
110	Cancer	10	8	Respiratory and cancer	8
53	Cardiac rehabilitation	11	1		
81	Cerebral palsy	12	8		
10	Chest pain - cardiac	13	1	Newer categories - 20/3/2005	
13	Chest pain – non cardiac	14	8	CV disease	1
76	Chronic fatigue syndrome/ME	15	8	Overweight/obesity	2
91	COPD	16	8	Diabetes	3
14	Crohn's Disease	17	8	musculoskeletal health	4
15	Depression / mental health	18	5	psycho well-being	5
121	Diabetes Type I	19	3	cancer - other	8
111	Diabetes Type II	20	3	respiratory - other	8
82	Epilepsy	21	8	other	8
87	Fatigue	22	8	high BP - cv disease	1
114	Fracture / bone break	23	4	unfit/sedentary	10
116	Head injury	24	8		
115	Headaches / migraines	25	8		
117	Heart block	26	1		
48	Heart failure	27	1		
118	Heart problem other - see Additional	28	1		
32	High cholesterol (Hyperlipidaemia)	29	8		
41	Hip problem/replacement	30	4		
16	Hypertension (High Blood Pressure)	31	1		
84	Immobility	32	8		
39	Ischaemic heart disease (IHD)	33	1		
40	Joint pains/dislocation/hypermobility	34	4		
51	Knee surgery/problem	35	4		
65	MI	36	1		
67	Multiple Sclerosis	37	8		
98	Musculoskeletal Pain - Ankles	38	4		
101	Musculoskeletal Pain - Back	39	4		
97	Musculoskeletal Pain - Back	40	4		
100	Musculoskeletal Pain - Hips	41	4		
99	Musculoskeletal Pain - Knees	42	4		
102	Musculoskeletal Pain - Neck	43	4		
105	Musculoskeletal Pain - Other	44	4		
103	Musculoskeletal Pain - Shoulder	45	4		
104	Musculoskeletal Pain - Wrist	46	4		
19	Neuralgia / motor neurone disease	47	8		
21	Not specified	48	8		
22	Obesity / Overweight	49	2		
3	Osteoarthritis – limbs	50	4		
5	Osteoarthritis – Other	51	4		
4	Osteoarthritis – spine	52	4		
23	Osteoporosis / Osteopenia	53	4		
96	Other - See Additional Information	54	8		
83	Pagets disease	55	8		
34	Palpitations	56	1		
92	Paralysis	57	8		
120	Parkinsons Disease	58	8		
43	Peripheral vascular disease /	59	8		
37	Polymyalgia rheumatica /	60	4		
112	Rehab - chemical dependency	61	8		

113 Rehab - injury/surgery/illness	62	8	
74 Rheumatoid arthritis	63	4	
30 Smoking – trying to stop / stopped	64	8	
27 Stress / tension	65	5	
28 Stroke/CVA	66	8	
119 Take out	67	8	
33 Unfit / Sedentary Lifestyle	68	8	10
29 Weight problem / control	69	2	

Client Details

Title: Mr / Mrs / Miss / Ms / Dr

Name:

Date of Birth:

Address:

.....

.....

.....

Town:

Postcode:

Best telephone number to call:

(.....)

(.....)

Best time to call:

.....

.....

Reasons for Referral:

.....

.....

.....

Relevant Medical History:

.....

.....

Medication:

.....

.....

.....

.....

Recent Blood Pressure Reading: /

Additional Information (eg. activity to be

avoided):

.....

.....

This section must be completed by the health professional

I recommend that the client named above should undertake a programme to increase his/her physical activity levels.

Referrer Details

Name: Signature:

Position: GP / Practice Nurse / Health Visitor / Physiotherapist / Dietitian /

Surgery/Place of work:

Date of referral: / /

This section must be completed by the client

Client Consent: I give permission for this information to be passed to staff on the ProActive Scheme

Clients Signature: Date: / /



Personal Client Record

Referral Information

ClientNumber: 1

Mr Alan Example

1 The Street

Reasons for Referral Obesity / Overweight
Hypertension (High Blood Pressure)
Angina

Anytown
Anycounty

Medication Beta blocker - atenolol, aspirin,
GTN spray

Telephone(Home)

Telephone(Work)

BestNumber: 0100 000000

BestTime:

BestDay: Monday - Thursday

Additional Information Started healthy eating BP 150/80,
angina stable

Referrer Code:

Referrer

Location:

Personal Information

Gender Male

Age 45

Occupation Manager
Full Time

Additional Information from CRM:

Would like to be able to walk upstairs without getting so breathless, enjoys walking dogs, finding it hard though, wants to improve fitness and help weight loss, eating healthily. Needs motivation, feels he is not sporty enough for gym.

Initial Assessment Information

<p>Initial meeting date</p> <p>Attended Yes / No</p> <p>If not attended reason</p> <p>Physical Activity Objectives (Goals)</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>Physical Activity Barriers (reasons for not being so active)</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>Height metres</p> <p>Weight kilograms</p> <p>Blood Pressure mmHg (important)</p>	<p style="text-align: center;">Lifestyle Assessment</p> <p>Physical Activity / times per week (number of sessions they do physical activity lasting 15 mins or more)</p> <p>Strenuous (Breathless)</p> <p>Moderate (cycle/brisk walk)</p> <p>Mild (walking)</p> <p>Physical Activity Stage of Change</p> <p>1. Not wishing to be active <input type="checkbox"/></p> <p>2. Thinking about being active <input type="checkbox"/></p> <p>3. Preparing to be active <input type="checkbox"/></p> <p>4. Becoming more active <input type="checkbox"/></p> <p>5. Maintaining activity <input type="checkbox"/></p> <p>6. Relapsing <input type="checkbox"/></p> <p>Smoker Yes / No (how many?/day)</p> <p>High Cholesterol? Yes / No</p>
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Final Assessment Information

<p>Final Assess (at end of first course or date they last attended)</p> <p>Date Attended Yes / No</p> <p>If not attended reason</p> <p>Total no of sessions attended.....</p> <p> out of planned (ie 2/wk)..... sessions</p> <p>Physical Activity Objectives (goals)</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>Physical Activity Barriers (ie.time)</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>Height metres</p> <p>Weight kilograms</p> <p>Blood Pressure mmHg (important)</p>	<p style="text-align: center;">Lifestyle Assessment</p> <p>Physical Activity / times per week (number of sessions lasting 15 mins or more)</p> <p>Strenuous</p> <p>Moderate</p> <p>Mild</p> <p>Physical Activity Stage of Change</p> <p>1. Not wishing to be active <input type="checkbox"/></p> <p>2. Thinking about being active <input type="checkbox"/></p> <p>3. Preparing to be active <input type="checkbox"/></p> <p>4. Becoming more active <input type="checkbox"/></p> <p>5. Maintaining activity <input type="checkbox"/></p> <p>6. Relapsing <input type="checkbox"/></p> <p>Smoker Yes / No (how many?/day)</p> <p>High Cholesterol? Yes / No</p>
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GUIDELINES FOR REFERRERS



REFERRAL SCHEME FOR COMMUNITY PHYSICAL ACTIVITY (INCLUDING FALLS PREVENTION AND PHASE IV CARDIAC REHABILITATION)

The ProActive Physical Activity Referral Scheme is a countywide scheme designed to provide a safe introduction to physical activity for people who have specific health problems and have previously led an inactive lifestyle. We welcome referrals for clients who would benefit from a **structured** approach to increasing their activity levels. Our aim is to provide safe and effective exercise within the knowledge base and experience of our instructors, all of whom have been assessed by Somerset Physical Activity Group and achieved the required standard to be working on the scheme (in line with the National Quality Assurance Framework Document, DoH 2001).

The scheme is designed for patients who will be able to exercise independently once they have completed the scheme. Clients who require continuous 1-1 supervision or help with undressing can be accepted if a carer is in attendance.

The patient will be clinically assessed by the referrer and the decision to refer should be made in accordance with published UK guidelines (available on request).

Contraindications for referral to exercise:

Cardiac

- Unstable angina
- Uncontrolled cardiac arrhythmias causing symptoms or haemodynamic compromise
- Severe symptomatic aortic stenosis
- Uncontrolled symptomatic heart failure
- Acute pulmonary embolus
- Acute myocarditis or pericarditis
- Suspected or known dissecting aneurysm
- Tachycardia of >100 bpm at rest
- *Uncontrolled* Hypertension i.e. Resting Systolic > 180mmHg & / or Diastolic >100mmHg

Metabolic

- *Uncontrolled* metabolic disease (e.g. diabetes, thyrotoxicosis, or myxoedema)

Muscular

- Neuromuscular, musculoskeletal, or rheumatoid disorders that are *exacerbated* by exercise

Other

- Acute infections/illness/fever
- *Uncontrolled* mental health condition
- Significantly impaired cognition (unable to follow simple movement instructions)

TO REFER A PATIENT TO PROACTIVE:

- Complete a referral form for each patient
- The patient must be asked to sign the form
- The form is sent to the address opposite
- Patient is given a ProActive leaflet

Client Details:

Title: DOB:

Name:

Address:

Town: Postcode:

Best telephone number / fax and time to call:

(.....)

E-mail address:

Reason for referral:

Recent Blood Pressure Reading: /

Resting Heart Rate: bpm

Height: m Weight: kg

Waist circumference (if available): cm

Appropriate referral checklist. Please tick each box:

- ☐ Are you confident that the patient is motivated to undertake a programme of structured activity?
- ☐ The patient is clinically stable
- ☐ The patient is compliant with medication
- ☐ The patient does not have any contraindications to exercise as indicated on the Guidelines for Referrers
- If these are not ticked, please DO NOT REFER**

Medication:

Additional Information (e.g. activity to be avoided):

✓ Relevant medical history

(please mark as appropriate)

- ☐ Overweight / Obese
- ☐ Hypertension
- ☐ Stable Angina
- ☐ CVA
- ☐ Claudication
- ☐ Type 1 Diabetes
- ☐ Type 2 Diabetes
- ☐ COPD (disease severity is mild)
- ☐ Asthma
- ☐ Epilepsy
- ☐ Neurological
- ☐ Osteoarthritis
- ☐ Rheumatoid Arthritis
- ☐ Osteoporosis
- ☐ Other Orthopaedic/Musculoskeletal problems
- ☐ Anxiety
- ☐ Depression
- ☐ Other mild Mental Health issues
- ☐ History of Falls
- ☐ Fear of Falling
- ☐ Other (please state)
- ☐
- ☐

✓ Cardiac

(required for risk stratification of all cardiac patients)

- ☐ MI Date: ☐ Anterior
- ☐ Inferior
- ☐ Unknown
- ☐ CABG Date:
- ☐ Arrhythmia Details:

Other (please state)

- ☐
- ☐

Investigations (if available)

- ☐ ETT Date: Result:
- ☐ Full ☐ Modified
- LV function ☐ Good > 50%
- ☐ Moderate 35-50%
- ☐ Poor < 35%

Referrer Details

Name: Signature:

Position: GP / Practice Nurse / Health Visitor / Physiotherapist / Dietitian

Surgery/Place of work: Date of referral:/...../.....

Client Consent: I give permission for this information to be passed to staff at ProActive

Clients Signature: Date:/...../.....



ProACTIVE

Somerset **NHS**
Health Authority

Increasing physical activity through a community-based intervention: A study to assess the effectiveness of the Somerset Physical Activity Referral Scheme

ProACTIVE is a countywide scheme designed to provide a safe introduction to physical activity for people who have specific health problems and have previously led an inactive lifestyle. The scheme forms part of a wider strategy to encourage 'more people to be more active more often'.

Objective:	To investigate changes in physical activity levels for people referred to a community-based Physical Activity Referral Scheme.
Design:	A pragmatic before and after design was used to track patients who had been referred to the scheme.
Subjects:	610 patients were referred to the eight leisure providers operating the scheme between December 1995 and July 1997. 548 were included in the study 222 (40%) males and 326 (60%) females.
Intervention:	Subjects were referred to one of eight recognised leisure providers to take part in a physical activity programme designed to introduce people to a more active way of life.

Results

- Three-quarters of people who start the scheme completed their programme of physical activity
- People who completed the programme had significantly increased their physical activity levels from baseline to six months follow up.
- Intention to treat analysis also showed a significant overall improvement in physical activity levels from baseline to six months.
- Significant improvements in some aspects of perceived health (physical functioning, role physical, vitality) were found for people who completed the physical activity referral.

INTRODUCTION

Regular physical activity affords well-established benefits to health which have stimulated a growing interest in the promotion of physical activity. Physical fitness and regular physical activity have been shown to be associated with reduced all cause and more specifically cardiovascular disease mortality'. *Sedentary or unfit men who become more active and improve their fitness have reduced mortality rates, the reduction being comparable to that associated with stopping smoking'. Whilst the amount and type of physical activity necessary to achieve particular health benefits is still a matter of some debate, the current recommendation is that all adults should accumulate 30 minutes or more of moderate intensity physical activity on at least five days per week* (moderate activity includes brisk walking, gardening and cycling). This was intended to complement the previous recommendation of 20 minutes vigorous activity on three or more days per week. Despite these benefits, most

of the population are not sufficiently active.

It has been recognised that the promotion of physical activity requires multi-sectoral collaboration'. 'Referral for exercise' schemes provide an example of joint working, involving direct collaboration between health and leisure professionals. A lack of knowledge regarding the effectiveness of these schemes was however highlighted in a British Medical Journal editorial in 1994'. Whether schemes are able to attract those who exercise least and produce long term changes in exercise behaviour must be determined.

A UK primary care based randomised controlled trial has recently been published'. This study investigated 142 patients who had coronary heart disease risk factors and had accepted a postal invitation to participate. They were either randomly assigned to the programme or were observed for 9 months prior to the referral. The study demonstrated

short-term improvements in both activity levels and modifiable risk factors for CHD, such as skinfold measurements and systolic blood pressure.

Whilst randomised controlled trials of 'referral for exercise schemes' are able to provide information on the effectiveness of the intervention, it is important that these studies are complemented with appropriate evaluations of schemes 'in situ' without the introduction of amended referral procedures or staffing.

Somerset operates a countywide scheme whereby patients are referred from health professionals in primary care to 'recognised' leisure providers (leisure centres and individual exercise leaders) in the community.

The purpose of this study was to investigate changes in physical activity participation for people who had been referred to the community-based Physical Activity Referral Scheme.

METHODOLOGY

Study protocol - Based on a pragmatic before and after design, referred patients were studied as they progressed through the scheme, from referral to final follow up after six months. Fieldwork for the study was incorporated into the normal running procedures of the scheme. Information was collected at four stages: *referral*, *pre-programme* assessment, *post-programme* assessment and six months follow up. This process of data collection is summarised in figure 1.

All patients referred to eight participating leisure providers (six centres and two individual exercise leaders) between December 1995 and July 1997 were eligible to be included in the study. The health professional completed a standard referral form for each patient including patient name, address, reason(s) for the referral and source of the referral. Both the referrer and the patient signed the form and each retained a copy, further copy was sent to the evaluation team. Patients contacted the leisure provider to arrange an initial meeting. The exercise leader provided an introduction to the scheme and conducted an assessment of the individuals physical activity requirements. A personal client record (PCR) was started for each individual in order to monitor their progress. Baseline information on their physical activity level and perceived health status was collected by asking patients to complete a 'Physical Activity and Health Questionnaire' which incorporated a *physical activity questionnaire* (the Godin and Shepard Scale¹⁰) and a generic health questionnaire, (the SF36¹¹).

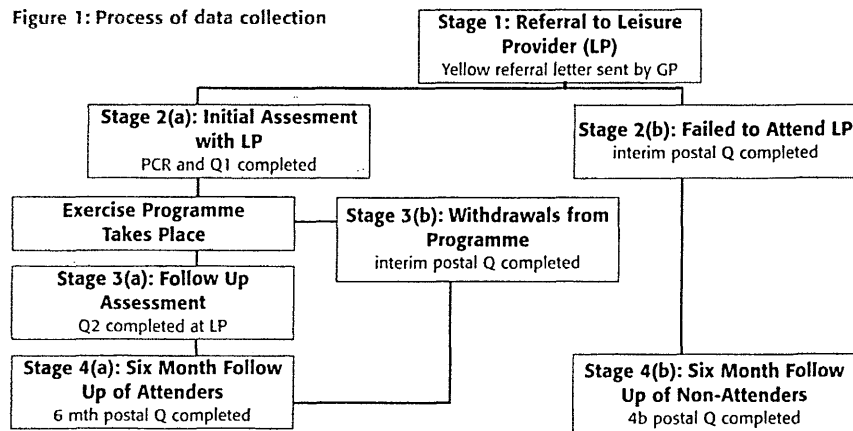
Patients were tracked as they progressed through the scheme and were placed in to one of the three following categories according to their compliance:

Completers (C): patients who completed their activity programme and post exercise assessment with the exercise leader. Completion was defined as attending a minimum of 80% of the fixed number of sessions as determined by the leisure provider – two leisure providers required patients to achieve this level of attendance within a set time period.

Non completers (N): patients who had an initial assessment with the exercise leader but subsequently withdrew without participating in a minimum of 80% of their agreed activity programme and hence not attending a post exercise assessment.

Failed to attend (F): patients who received a referral letter but did not attend an initial assessment with the exercise leader and did not take up any supervised exercise under the Physical Activity Referral Scheme.

Figure 1: Process of data collection



Patients who were referred but did not arrange or attend an initial assessment (F) were sent a questionnaire after 6 weeks had elapsed from the date of referral. This questionnaire included the physical activity scale and personal details equivalent to those collected in the personal client record. These patients were also asked about reasons for non-attendance.

An individual physical activity programme was agreed with each lasting between six and twelve weeks depending on the leisure provider. It included activities at home and with the leisure provider, most commonly gym-based circuits using cardiovascular equipment, group circuits, swimming and walking. A patient's progress was monitored and the plan amended accordingly throughout the duration of the programme.

Attendance records maintained by the leisure provider identified patients who withdrew during the exercise programme (N). The patients were contacted by telephone or letter in cases of unexplained absence for more than two weeks, they were then sent the non-attendance questionnaire to assess their physical activity level and possible reasons for their withdrawal.

Patients who completed their programme (C) met with the exercise leader at the end of their programme. During this meeting, patients were again asked to complete the physical activity scale and SF 36.

All patients who had completed their programme (C), withdrawn (N) or failed to attend (F) between October 1996 and July 1997 were followed up six months after their last contact with the scheme.

Patients who completed their programme (C) were sent a postal questionnaire six months after their final assessment with the exercise leader. This incorporated the physical activity scale and the SF 36. Patients who withdrew before completing (N) were also followed 6 months from the date of their last contact with the

leisure provider. They were also sent a questionnaire incorporating the physical activity scale and SF 36, with reminders to non-responders after two weeks. Patients who failed to attend (F), were sent a postal physical activity scale six months from their referral date.

Measurement Tools - The Godin and Shepard scale was selected for this study because it is a simple, quick questionnaire suitable for self completion in a community setting and, whilst representing an overall indicator of physical activity, it also considers the intensity of activity. A modified version was used in order to include both leisure and work activity. This modified version has been used in previously published work¹.

Physical activity levels were classified into the categories of activity used for the Allied Dunbar National Fitness Survey¹² as seen below.

Allied Dunbar National Fitness Survey, Physical Activity Levels

20 minute occasions (all activities) in past four weeks of vigorous or moderate/mixed activity

Level 0:	none
Level 1:	1-4 occasions mixed between moderate and vigorous activity
Level 2:	5-11 occasions mixed between moderate and vigorous activity
Level 3:	12 or more occasions of moderate activity
Level 4:	12 or more occasions mixed between moderate and vigorous activity
Level 5:	twelve or more occasions of vigorous activity

The Short Form 36 (SF 36) is a generic measure of health status. It is intended for self-completion and produces a profile of health across eight dimensions¹¹. It has been shown to be reliable and valid and normative data for UK adults have been published^{12,13}. It appears acceptable to patients and suitable for postal use, taking about five minutes to complete. A generic measure was appropriate for this study because the study population includes patients with a range of conditions; the number with a particular condition is likely to be too small for separate analyses.

RESULTS

Study sample- Between December 1995 and July 1997, 610 patients were referred to the eight participating leisure providers and were therefore initially eligible to be included in the study. 62 patients were excluded for the reasons shown below as it was not possible to determine what their compliance to the programme would have been: moved away with no forwarding address (n=28); requested not to be involved (n=3); insufficient records maintained by the leisure provider (n=24);

Reasons for referral - Referring health professionals were asked to write reason(s) for referral on the referral letter. A maximum of five reasons for referral were entered into the database. Reasons for referral were grouped into 16 categories. The proportion of referrals occurring in each category can be seen in figure 2 (percentages do not total 100% as patients may be referred for more than one reason).

Referring health facilities/ professionals - The 548 patients included in the study

subset. The results at six months are shown in table 1 and are compared in figure 3. An intention to treat analysis was conducted for the six-month follow-up subset. The analysis showed that there was a significant overall increase in physical activity level (Wilcoxon signed rank test for related samples: $z=-3.6$ $p<<0.01$)

Changes in perceived health status after six months - SF36 scores were collected for all people who took up their referral. Figure 4 shows the baseline and six-month SF36

Figure 2: Reasons for referral

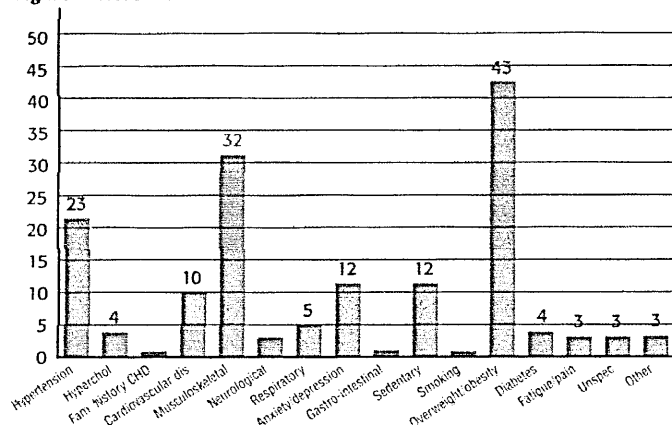
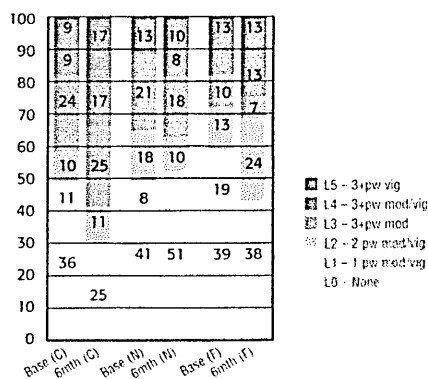


Figure 3: Baseline and 6 month follow-up activity levels



considered unsuitable for the scheme by the leisure provider and sent back to the referrer (n=7). This resulted in a sample of 548 referred patients, 90% of the total referred to the eight participating leisure providers. 68% of those included in the study were included in the six month follow up sample (n=372).

Baseline characteristics of the referred population showed that of the 548 patients referred, 60% (n=326) were female and 40% (n=222) were male. The average age was 50 years for females and 52 years for males (age was known for 76% of the sample). Body Mass Index was calculated from self reported height and weight.

This information was available for 51% of the sample and respondents had a mean BMI of 34. 62% of those referred that gave their height and weight were classified as obese.

were referred from 33 general practices and 4 hospitals. The numbers referred from these sources during the study period varied from 1 to 81 patients, with a mean of 15 referrals. 60% were referred by a GP, 36% by a practice nurse or health visitor and 4% by 'other' health professionals (primarily physiotherapists or osteopaths).

Changes in physical activity - The results of this study show that people who completed their referral programme had significantly higher physical activity levels six months after finishing the programme compared to baseline (Wilcoxon signed rank test for related samples: $n=169$; $p<0.01$). There were no significant differences found between baseline and six-month physical activity levels for people who withdrew from the programme or for people who did not take up their referral. Matched six-month physical activity data was available for 67% of the follow up

profile for those who completed the programme and norms for England¹¹. A significant improvement was found between baseline and six months for three dimensions of the SF36; physical functioning ($p=0.03$), role physical ($p=0.01$) and vitality ($p<0.01$). There was a significant decline between baseline and 6-month follow up in the role physical dimension ($p=0.02$) for people who did not complete the referral programme.

Take up of referral and compliance to the programme - of the 548 patients included in the study, 33% (n=181) failed to take up their referral (F), 16% (n=89) began but did not complete the programme and 51% (n=278) began and completed the programme (C). Of those patients who initially took up their referral (C + N, n=367), 76% completed the programme and 24% withdrew before the end of their programme. Figure 5 shows the compliance profile of the sample.

Table 1: Baseline and 6 month physical activity levels

Physical Activity Level	Completed (n=169)		Did not complete (n=39)		Failed to attend (n=40)	
	% (95% CI)	No	% (95% CI)	No	% (95% CI)	No
Level 0 Base	36 (28.9-43.3)	61	41 (25.6-57.9)	16	39 (24.9-56.7)	16
6 mth	25 (18.9-32)	43	51 (24.8-67.6)	20	38 (22.7-54.2)	15
Level 1 Base	11 (6.5-16)	19	8 (1.6-20.9)	3	19 (9.1-35.7)	8
6 mth	5 (2.5-9.9)	9	3 (0.06-13.5)	1	5 (0.6-16.9)	2
Level 2 Base	10 (5.5-14.6)	17	18 (7.5-33.5)	7	13 (4.2-26.8)	5
6 mth	11 (6-15.3)	18	10 (2.9-24.2)	4	24 (12.7-41.2)	10
Level 3 Base	24 (17.8-30.7)	41	21 (9.3-36.5)	8	10 (2.7-23.7)	4
6 mth	25 (18.3-31.4)	42	18 (7.5-33.5)	7	7 (1.6-20.4)	3
Level 4 Base	9 (5.5-14.9)	16	-	0	5 (0.6-16.9)	2
6 mth	17 (11-22.2)	28	8 (1.6-20.9)	3	13 (4.2-26.8)	5
Level 5 Base	9 (5.1-14.2)	15	13 (4.3-27.4)	5	13 (4.2-26.8)	5
6 mth	17 (11.5-22.8)	29	10 (2.9-24.2)	4	13 (4.2-26.8)	5
Wilcoxon p=	p<0.001		p=0.68		P=0.17	

Figure 5: Compliance to the Programme

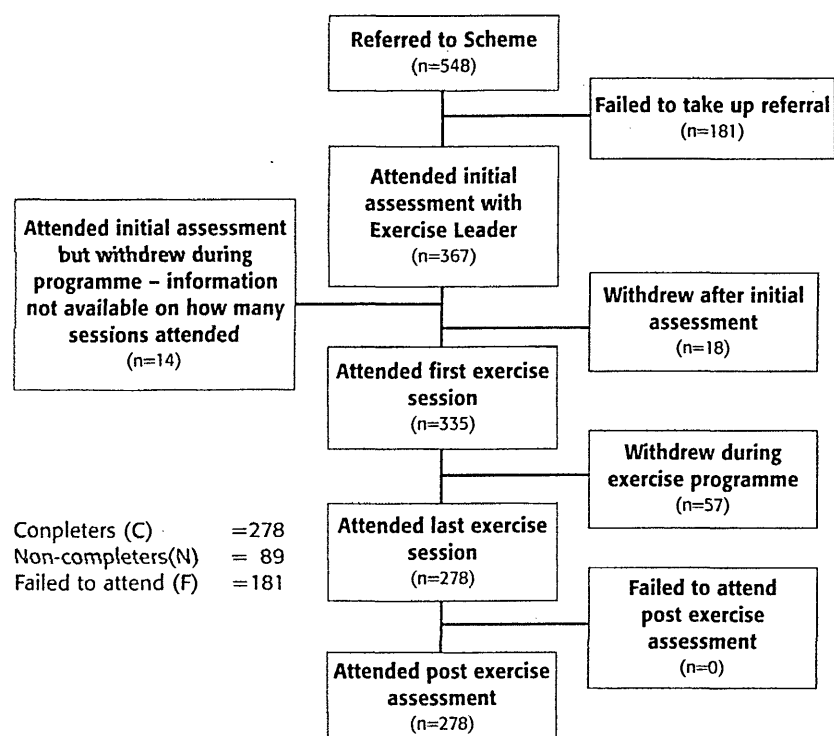
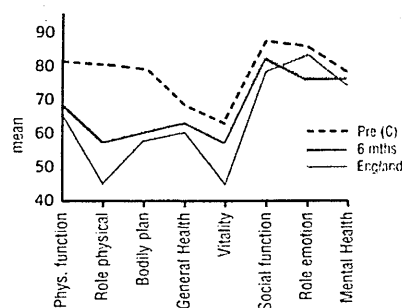


Figure 4: Difference in health status baseline and 6 month scores (completers)



SF 36

Factors associated with initial take up of the scheme - 67% of patients took up their referral and attended the initial assessment with the leisure provider. Table 2 compares the characteristics and baseline measurements of those patients who took up the referral and those who did not. People who were not in paid employment ($p<0.05$) were more likely to take up their referral. Patients who had been referred because they led a sedentary lifestyle were also more likely to take up the referral ($p<0.05$) however, patients referred due to mental health problems were less likely to begin the scheme.

Factors associated with adherence to the programme - To investigate if any patient

characteristics at baseline were associated with adherence to the programme (i.e. completion of the programme once initial assessment had been attended), comparisons were made between those patients who completed the scheme (C) and those who began but withdrew before the end (N). Non-smokers ($p<0.01$), older people ($p<0.01$) and people referred for musculoskeletal problems ($p<0.01$) were found to be more likely to complete the programme.

Baseline perceived general health status also showed a significant association with the programme adherence. People who completed the programme were found to have significantly higher baseline scores for three SF36 dimensions; general health

(2 sample t-test: diff mean=5.4; $p=0.045$), social functioning (2 sample t-test: diff mean=7.9; $p=0.03$) and role emotional (2 sample t-test: diff mean=12.5; $p=0.02$) compared to people who did not complete.

Reasons identified for not taking up the referral/non-compliance - The main reasons given for not taking up the referral were; times not convenient (34%); financial reasons (32%); not at ease at the leisure provider (28%) and too busy to go (25%). The main reasons given for withdrawing from the programme were illness (38%); too busy (29%); financial reasons (25%) and times not convenient (23%).

Table 2: Baseline characteristics of referred population

	Took up referral (n=367)	Did not take up referral (n=181)
Age in years [mean (sd)]	51.8 (13.7)	46.7 (14.5)
Women [% (95% CL)]	58 (53.3-63.4)	62 (54.8-69)
In paid employment [% (95% CL)]	45 (40.2-50.5)	81 (69.9-89.6)
Current smoker [% (95% CL)]	14 (10.7-17.9)	17 (9.3-28.4)
BMI [mean (sd)]	33.6 (7.5)	32.9 (7.9)
Reported history of high blood pressure [% (95% CL)]	30 (25.4-34.9)	28 (17.6-40.8)
Reported history of high cholesterol [% (95% CL)]	11 (7.4-14.5)	11 (4.6-21.5)
Physical activity		
Level 0 [% (95% CL)]	40 (35-45.1)	35 (24.6-45.4)
Level 1 [% (95% CL)]	10 (6.6-12.6)	13 (6.5-21.5)
Level 2 [% (95% CL)]	13 (9.2-15.9)	9 (4.1-17.3)
Level 3 [% (95% CL)]	22 (17.8-26.3)	15 (8.2-24.2)
Level 4 [% (95% CL)]	7 (4.5-9.9)	8 (3.3-15.9)
Level 5 [% (95% CL)]	9 (6-12.1)	21 (12.8-30.7)

CONCLUSIONS

The results of this study have demonstrated that the physical activity levels of people who completed the referral programme significantly improved from baseline to six months after the end of the programme. Significant improvements in areas of perceived health were also identified at six months for people who completed the programme. Age, employment status and certain referral conditions were associated with taking up the referral and age, smoking status and being referred for musculoskeletal problems was associated with adherence to the programme.

The results of this study indicate that the scheme has been effective in increasing physical activity levels amongst completers. However a number of recommendations can be drawn from the results to further the delivery of such

schemes. Training for leisure providers should aim to develop particular expertise in the most common reasons for referral (i.e. weight problems and musculoskeletal problems).

The referral mechanism used should aim to maximise the uptake of the scheme. In the case of a co-ordinated district or county-wide scheme, operating a central referral mechanism whereby health professionals refer patients to the scheme, but not to a specific leisure provider, would increase the advice and information given to patients. It would also ensure the patients are referred to the leisure provider which best suits their needs.

Initial take up and adherence of schemes should continue to be monitored on an ongoing basis.

In the light of current widespread interest in physical activity promotion, the

development of a valid, reliable and standardised measure of physical activity is urgently required to enable direct comparison to be made between studies. In association with this, the categorisation of physical activity levels needs to be reviewed to incorporate the new national guidelines.

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DISCUSSION

This study has demonstrated encouraging results for the effectiveness of the scheme in increasing physical activity levels. 76% of those who took up their referral went on to complete a physical activity programme. Amongst these patients, physical activity levels were significantly higher 6 months after finishing the programme than at the beginning of the programme. No such increases were found amongst patients who withdrew during the programme or did not take up their referral. Patients who completed a programme also showed some significant improvements in perceived health status after 6 months, similar improvements were not found for patients who did not complete the programme.

The uptake and adherence results compare favourably with results of other studies^{14, 15, 16, 17, 18}. Adherence is an important measure because as demonstrated in this and other work¹⁴, positive outcomes were only seen for patients who completed a physical activity programme. Other studies have shown adherence to be greatest amongst those most active at baseline^{14, 16}, however in this study adherence to the exercise programme was unrelated to baseline physical activity. Whilst some evaluations have only considered adherence, information on uptake is important in order to investigate reasons for non-take-up and identify personal characteristics which may help predict the likelihood of taking up the referral.

Patients referred to the scheme were, on average, older than the local population and more likely to be female. The most common reasons for referral were overweight/obesity, musculoskeletal disorders and hypertension.

Although the physical activity results found here are highly significant, the limitations of this study must be acknowledged. Physical activity was measured using a self completion questionnaire which, although widely used, has limited published evidence of its reliability and validity. No attempts were made in this study to assess these criteria but the area of physical activity assessment itself requires further research^{5, 16}.

This study was a pragmatic 'before and after' design with additional comparisons made between completers and non completers. There was no true control group for comparison; non-completers are not equivalent to a control group because both the completers group and non completers were self selected in effect rather than randomly assigned; in addition non-completers will have received some of the intervention. However, whatever the factors resulting in an individual becoming a completer rather than a non-completer, this should not detract from the fact that

significant increases in physical activity were seen only amongst completers. The lack of control group does mean that changes in physical activity amongst completers cannot necessarily be attributed to the scheme. It could be argued that observed increases are in line with the physical activity increases seen in Somerset. Between 1992 and 1997 the proportion of Somerset population (age/sex standardised to the study population) defined as inactive, decreased from 51%²⁰ to 43%²¹. A greater reduction of inactivity was found here amongst completers however, the six-month follow up period used in this study does not allow direct comparison to be made.

Non response is a potential source of bias; 85% of completers in the 6 month follow up sample provided physical activity information at 6 months and whilst this is a good response rate, these may have also been those most likely to maintain higher physical activity levels. However, if the assumption is made that the 15% who didn't return a 6 month questionnaire had not changed from baseline, analysis of baseline to 6 months physical activity levels amongst *all* completers in the follow up sample, still produced a significant result ($p < 0.01$). Similarly, an intention to treat analysis based on the assumption that the physical activity levels of non-responders did not change from baseline, also shows an overall significant increase in physical activity (Wilcoxon signed rank test for related samples: $Z = -3.9$ $p < 0.01$).

Several factors were considered in the design of this study. Whilst a randomised controlled trial may be considered the gold standard for evidence of effectiveness²² it has recently been acknowledged by a World Health Organisation (WHO) European working group on health promotion evaluation that such a design is often not appropriate for health promotion interventions²³. The physical activity interventions in this countywide scheme based in a variety of leisure providers were not standard; they differed in content and delivery whilst remaining within the criteria for the overall scheme. Another reason why a randomised-controlled trial was not felt appropriate in this case was that a comparable control group completely unexposed to any aspect of the intervention would have been difficult to achieve in this context. It was also considered important that the actual scheme was evaluated rather than a standardised trial within the scheme so that the findings would apply to the whole scheme as it operated at the time. Information on all patients referred was collected through the existing referral mechanism involving only health professionals. All aspects of the evaluation were incorporated into the day to day running of the scheme without the direct involvement of any research workers.

Due to the nature of the intervention it is difficult to determine which components contributed to the positive effect; the separate effect of different referrers, leisure facilities offered, length of programme, personalities involved and lifestyle advice offered cannot be determined. We have not attempted to determine the effectiveness of the scheme on an individual leisure provider basis because the numbers involved would be too small for meaningful analysis. Physical activity schemes across the country vary in design. There are a number of features of the Somerset scheme that may have contributed to the effects seen in this study that merit further discussion.

The requirement for leisure providers to undergo a formal application and assessment procedure in order to attain recognition status may have influenced the scheme in a number of ways. Referring health professionals and their referral patterns may have been influenced. Patients may be more likely to take up their referral confident in the knowledge that the leisure provider has been 'recognised'. The fact that leisure providers have successfully achieved their recognition status may influence the value they place on the scheme and their willingness to support the development of staff or provide increased resources for equipment.

A unique feature of the Somerset scheme is the provision of an Exercise Science Advisory Service. This service has provided specialist training and ongoing support for the leisure staff running the scheme. Training issues covered include: implementing adherence theory into practice, developing a motivating environment, developing exercise counselling skills, implementing administration and patient follow up procedures.

Gym-based physical activity is a predominant feature of many referral schemes. Whilst this type of activity is also provided in the Somerset scheme, there is a considerable emphasis placed on the need for leisure providers to include a variety of activities. Leisure providers seeking to become recognised must demonstrate how the scheme will link into, and make use of, additional local community facilities such as walking circuits and swimming pools. In addition, staff are also required to provide advice and support to patients on home-based physical activity and how it can be incorporated into every day life.

A recent systematic review of physical activity promotion interventions²⁴ highlighted features of the effective interventions; physical activity in and around the home, the promotion of walking and the use of telephone follow up. All of these features are included as part of the Somerset scheme.