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Portfolio of Doctorate in Health Psychology

By

Vanessa Rose Bogle

Submitted in fulfilment of the requirements

of the degree

DOCTORATE IN HEALTH PSYCHOLOGY

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Section A: Preface

Putting Health Psychology into Practice

PREFACE

This portfolio documents evidence of how the required competencies for the Professional Doctorate in Health Psychology were achieved, highlighting both the knowledge base and skill level required to become a Health Psychologist. Specifically, the portfolio consists of practical examples of how health psychology theory and knowledge have been put into practice within the NHS setting, in the form of five case studies, one Systematic Review and a Doctoral Thesis, conducted over a period of two and a half years. A common thread runs through all the competences, in that the topics were centred on two key national Government health priorities (Department of Health, 2005b); physical activity, specific to increasing activity levels amongst inactive patients in the primary or secondary prevention of long-term health conditions, and in the area of tackling obesity.

In recent years the importance of regular participation in physical activity has risen up the Government's agenda and has been identified as an area of high priority. This topic was chosen for the main focus of my training based on the fact that despite the numerous health benefits associated with leading a physically active lifestyle, modifying physical activity behaviour presents major challenges. Adherence rates remain low and to-date evidence of effective strategies for improving initiation and maintenance is unclear with further research needed in this area, particularly in the UK. I identified the importance of the role of health psychology in the design and evaluation of physical activity interventions. I also recognised its potential role in changing individual behaviour and in making valuable contributions towards increasing psychological knowledge in this area.

Starting with the optional competency, unit 5.8 (disseminate psychological knowledge to address current issues in society) a successful funding application was submitted to develop a psychological intervention to assist inactive patients to increase their levels of physical activity for the primary or secondary prevention of cardiovascular disease (CVD). The design, conduct and evaluation of the above intervention (a three group randomised controlled trial comparing Motivational Interviewing, a client-centred approach to counselling and implementation intentions with usual care) formed the basis for my Doctoral Thesis. The findings of the research were to be used to inform professional practice in this area.

This subsequently led to the Teaching and Training competency, in the delivery of a number of 2-day workshops to train a wide range of health care professionals and others working in health promoting roles in Motivational Interviewing techniques. The aim of the training was to improve the communication skills of the participants and to teach them a counselling approach to help people to change health-related behaviours such as increasing physical activity levels, stopping smoking and to better self-manage long-term health conditions such as diabetes and coronary heart disease (CHD). Participants of the training also included exercise practitioners who delivered the above-mentioned physical activity intervention. Having attended the teaching and training workshop and having had the opportunity to deliver teaching and training to a range of audiences, including students and health care professionals, I feel more confident in my ability to plan, deliver and evaluate such training. This process has led to me having a better understanding of the different models of learning and how to apply them practically to meet the individual needs of participants.

During the period of my training I have undertaken various pieces of work on a consultancy basis, most being within the area of physical activity and behaviour change. The main consultancy case study within the portfolio details my

experience of delivering Motivational Interviewing and physical activity promotion training to primary health care professionals as part of a Department of Health feasibility study into implementing a care pathway for physical activity in the primary care setting. This piece of work was secured following the submission of a successful tender. Closely linked to this consultancy was a second consultancy where I developed a demonstration DVD of the use of Motivational Interviewing within primary care. This involved writing the scripts for several simulated consultations, casting the actors and acting as the director during the filming. The DVD was used as part of the evaluation process for the study, and more recently, in promoting the care pathway, soon to be rolled out nationally. My experience in consultancy also extends to conducting a qualitative piece of research work for a London-based stop smoking service to explore the support required by clients to achieve long-term abstinence from smoking. This has further enhanced my qualitative research skills and my experience in undertaking different types of consultancy work.

The chosen topic for the second optional competency and systematic review was obesity. As the lead for both child and adult obesity within my role of Public Health Strategist, the need for a local obesity strategy was identified within my work programme. The aim was to set out a strategic approach to preventing and managing existing cases of obesity. A review of the evidence in this area was undertaken which informed an obesity action plan I developed, in addition to informing the development of numerous interventions to address healthy eating and physical activity. I also led on the planning and delivery of a local obesity conference to raise the profile of obesity and the need to tackle this issue on a local level. A further aim of the conference was to make health care professionals and others aware of training opportunities, support and resources available to them. This piece of work provided the evidence for fulfillment of the optional competency, Unit 5.4 (provide psychological advice to aid policy decision making for the implementation of psychological services).

Childhood obesity rates in Haringey were on the increase at a time when plans were being made locally on what services to commission to best meet the needs of the local population. A systematic review of psychological interventions to treat childhood obesity was conducted to provide information about their effectiveness, the results of which were used to inform the basis for decision-making regarding the commissioning of obesity services for children.

The health psychology doctorate training programme has provided me with the opportunity to apply health psychology theory and knowledge in practice, for example, in the development and evaluation of various behaviour change interventions. In doing so my research skills have been greatly enhanced, for example, in designing, conducting, evaluating and interpreting findings, which are key skills required by a health psychologist. My thesis demonstrates my ability to conduct research in health psychology independently.

The competencies gained through the training programme have collectively equipped me with the skills to practice as a health psychologist. I have also continued my professional development in a variety of ways, including attending conferences, training and through the dissemination of psychological knowledge, for example, in co-writing a book chapter on the complexities of behaviour within the field of dentistry. In addition, I have gained a wealth of experience in providing psychological advice and guidance to others, within both a consultancy capacity and within my substantive role within the NHS.

Having acquired the competencies to practice as a qualified health psychologist I now endeavour to seek opportunities for employment within a health psychologist role with more of a clinical focus, where I am involved in both the design and direct provision of psychological interventions to patients. Areas of interest include helping patients to self-manage long-term conditions such as diabetes or coronary heart disease, for which I have already gained some clinical

experience, or in the area of cardiac rehabilitation. I also plan to continue to provide behaviour change training for health care professionals on a consultancy basis.

To conclude, this portfolio has demonstrated how I have consolidated my learning on the doctoral health psychology training programme to achieve the standards required to become a qualified Health Psychologist in the areas of research, teaching and training and consultancy. This has involved critiquing the evidence base and applying health psychology theory and knowledge in innovative and creative ways to address key public health challenges.

Section B: Research

A Randomised Controlled Trial to test the efficacy of Motivational Interviewing and Implementation Intentions for a Physical Activity Referral Scheme

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my supervisors Professor David Marks and Dr Catherine Sykes whose persistence, support, guidance and expert advice have contributed greatly to my academic and personal growth. To my peers, especially Julie Pearson and Farah Khokhar-Cottrell, I extend my warmest regards for your continued support. I am also very grateful to Ms Gerry Taylor (former Assistant Director) and Dr Juliet Jensen (former Public Health Consultant) of NHS Haringey (formerly Haringey Teaching Primary Care Trust) for providing me with the opportunity to carry out my training with them. I would also like to thank Silvio Aldrovandi for his advice on carrying out the statistical analysis. Last but not least, I thank the dedicated exercise practitioners who worked with the referred patients, in particular Pamela Harbige and Gloria Salmon who also acted as scheme co-ordinators, and Michelle Lawrence-Scully for her invaluable administrative support.

I dedicate this thesis to my parents, late Clifton Bogle and Monica Bogle and offer special thanks to the rest of my family and close friends for their unconditional support and encouragement throughout my long and sometimes difficult journey. Lastly, I thank my son, Nathaniel, whose patience and consideration have enabled me to succeed.

I am sincerely thankful to you all.

DECLARATION

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ABSTRACT

Introduction

Regular participation in physical activity is important for health. However, the vast majority of the population in the UK are not active at levels to benefit their health, with people living with long-term health conditions being amongst the least active. In recent years in the UK physical activity referral schemes have become a popular approach within the primary care setting in promoting long-term participation in physical activity for sedentary patients with long-term conditions. Such schemes typically involve a health care professional referring a patient to a supervised exercise programme for a set period of time. This said, evidence for their effectiveness is limited. The aim of study was to examine the effects of a physical activity referral scheme on increasing physical activity levels in inactive patients using two behaviour change approaches, namely Motivational Interviewing and Implementation Intentions compared with a treatment as usual control group.

Method

Fifty-three patients were referred from primary care to a physical activity referral scheme for participation in a 12-week programme. Participants were randomly assigned to one of three groups: treatment as usual (control group), Implementation Intention group (intervention 1) Motivational Interviewing group (intervention 2). The main outcomes were changes in physical activity measured using 7-day physical activity recall and physical activity stage of change questionnaire items at three and six months, in addition to daily average step count using pedometers at three months.

Results

The primary hypothesis that a physical activity referral scheme using Motivational Interviewing or Implementation Intentions would increase physical activity levels and improve short and longer-term maintenance more so than a physical activity referral scheme on its own was not supported. Observed increases in physical activity levels across the three groups was not dependant upon the Motivational Interviewing or Implementation Intention interventions.

Conclusion

Physical activity referral schemes using Motivational Interviewing and Implementation Intention approaches to facilitate behavioural change may not be any more effective than a treatment as usual physical activity referral scheme. However, the study had several limitations that should be considered when interpreting the findings.

1. INTRODUCTION

1.1 Physical Activity

“Whenever I feel like exercise, I lie down until the feeling goes away”

(Robert M Hitchens)

1.1.1 Physical Activity – The Definition

Physical activity is defined as being any bodily movement produced by skeletal muscles that results in an energy expenditure, and includes a range of leisure-time, routine and occupational activities. The terms ‘physical activity’ and ‘exercise’ are often used interchangeably. However, exercise is a subset of physical activity and refers to physical activity that is planned and structured, involving repetitive bodily movements carried out with the objective of improving or maintaining one or more components of physical fitness (USDHHS/CDC, 1996).

1.1.2 An Overview

The World Health Organisation (2002) reported that physical inactivity is amongst the ten leading causes of death in developed countries, causing 1.9 million deaths worldwide each year. Physical inactivity is a growing public health concern in the UK and in many other westernised countries, and is associated with increases in obesity, cardiovascular disease (CVD), cancer, hypertension, and in the development of type II diabetes (DH, 2004a). Starting with the work of Morris, Heady, Raffle, Roberts and Parks (1953), compelling evidence has accrued on the beneficial role of physical activity in the prevention of coronary heart disease (CHD) (Blair, 1994). There is also evidence that

participation in regular physical activity can help in the prevention and treatment of over twenty long-term conditions or disorders, including stroke, obesity, some cancers, mental health and type II diabetes (DH, 2004a). Physical activity also appears to be protective against CHD in those with type I diabetes (Giacca, 1994). Increasing physical activity levels also has the potential of modifying other risk factors for CHD such as obesity, type II diabetes and hypertension (DH, 2004a).

The risk of premature death amongst physically active adults is reduced by 20%-30%, and the risk of developing major long-term conditions such as CHD, stroke diabetes and cancers are reduced by up to 50% (DH, 2004a). Estimates suggest that far more CHD deaths can be attributed to inactivity (37%) than to smoking (19%) or to hypertension (13%), second only to hyperlipidemia (McPherson, Britton and Causer 2002). This growing body of evidence has led to physical inactivity being recognised as a major modifiable risk factor for CHD, a preventable disease, which itself is the commonest cause of premature death in England, killing 110,000 each year (DH, 2000a). Other modifiable risk factors for CHD include smoking, hypertension, obesity and hyperlipidemia. The established link between physical activity and health has resulted in its profile being propelled up the public health agenda, which as a result has generated a lot interest from the media and has highlighted the need for physical inactivity to be given equal importance, in line with that given to other major causes of ill-health such as smoking and an unhealthy diet.

1.1.3 The benefits of physical activity

“Lack of physical activity destroys the good condition of every human being, while movement and methodical physical exercise save it and preserve it”

Plato (Ancient Philosopher)

Increasing levels of physical activity can confer many health benefits, and a dose-response relationship between physical activity levels and all-cause mortality,

and between physical activity and numerous disease have been found, namely that higher levels of physical activity are associated with greater health benefits. (Lee and Skerrett, 2001). Increasing levels of activity, even modestly, is associated with a reduction in the incidence of numerous long-term conditions. A 10% reduction in CHD risk could potentially be achieved by increasing physical activity levels from sedentary (classified as less than one occasion of physical activity of thirty minutes in one week) or light levels to moderate levels of activity (McPherson et al, 2002). This reduction in CHD risk is similar to that which could be achieved through reducing other risk factors of the disease, for example, in lowering cholesterol levels to less than 6.5mmol/l, which could potentially achieve a reduction in CHD of 11%. The public health burden of inactivity is immense and increasing levels of activity in the population would greatly benefit the health of the population.

1.2. The scientific evidence

1.2.1 Physical activity and cardiovascular disease (CVD)

The main forms of CVD are CHD and stroke. Since the 1950's, irrefutable evidence has accumulated on the association between physical inactivity and the risk of CVD, starting with the influential work in London of the now prominent researcher in this area, Professor Morris and his colleagues (1953). However, the majority of existing research in this area has focused on CHD as an outcome. Kohl (2001) conducted a review of the evidence of a dose-response relationship between physical activity and fatal and non-fatal CVD. The outcome measures used included fatal and non-fatal stroke and CHD. The review included five major population-based observational studies (eight publications) of physical activity and/or fitness as they relate to risk of CVD, all of which examined CVD mortality as an endpoint, and one reported on CVD incidence (fatal or non-fatal disease). All of the studies were prospective in their design, were carried out in large populations and had long-term follow-ups ranging from five to twenty-five years. Four publications included both male and female participants and the focus of two further publications were on females only. The focus of four studies

was on fatal CVD and four focused on a mixture of fatal and non-fatal outcomes. For all CVD combined, the majority of studies provided strong evidence for a dose-response relationship. Kohl (2001) reported that two studies demonstrated no evidence of a dose response relationship between physical activity and CVD risk, one reported mixed results and the remaining five studies demonstrated strong evidence of a dose-response relationship. Collectively, the majority of the studies indicated a causal link between the risk of CVD incidence and mortality to physical activity and evidence for a dose-response relationship.

1.2.2 *Physical activity and CHD*

Morris et al (1953) found that physically active individuals have a lower risk of CHD. These early studies focused on the relationship between occupational physical activity and CHD. For example, Morris et al (1953) conducted a study of London Transport workers and observed that bus conductors, who were more physically active in their work, were less affected by CHD in comparison to bus drivers, thought to be less active. His later research of male postmen and less physically active postal clerks reproduced similar findings.

In the aforementioned review, Kohl (2001), also examined twenty-three major observational studies (31 publications) for a dose response relationship of physical activity to the risk of CHD. One study was a case series, one used a case-comparison design, and one was a secondary analysis of a large randomised controlled trial on CHD. The remaining twenty studies were of a prospective design and were conducted in large populations and had long-term follow-up periods ranging from three to twenty-six years. Two of the twenty-three studies included female participants and two focused on female participants only. The main focus of nine of the studies was on fatal CHD and the remaining fourteen studies included a mixture of fatal and non-fatal outcomes. Kohl (2001) found that twenty of the studies lent support for a dose response relationship between physical activity and CHD, with three providing mixed support. Eight studies did

not support the conclusion of a dose-response relationship between physical activity and CHD.

1.2.3 *Physical activity in later life and CHD*

There is also evidence from studies conducted in the UK and the US that being physically active in later life confers health benefits (Wannamethee, Shaper and Walker, 1998; Paffenbarger et al, 1993; Blair, 1995), although this area has not been researched extensively. Contrary to these findings, two studies suggest that physical activity in later life was associated with an increased risk in CHD amongst men aged over 64 years (Hein, Suadicani, Sorensen and Gyntelberg, 1994) and in 1,405 women aged 38-60 years a small non-significant excess in mortality was associated with increased physical activity (Lissner, Bengtsson, Bjorkelund and Wedel, 1996).

Wannamethee et al (1998) conducted a prospective study of cardiovascular disease using data from the British Regional Heart Study of 7,735 men aged 40-59 years recruited from general practices in 24 British towns, to examine whether middle-aged or elderly men would benefit from adopting or increasing physical activity levels in later life. The association between physical activity in older men, all-cause mortality, and incidence of CHD was examined. In addition, the relationship between changes in physical activity in the participants over a period of 12-14 years and subsequent mortality outcome was assessed. The findings lend support to current recommendations for people of all ages to be more physically active and to sustain these increases across the lifespan.

Further findings revealed that adopting light or moderate physical activity or sustaining such activity levels led to reductions in mortality and heart attacks in older men, irrespective of pre-existing cardiovascular disease (Wannamethee et al, 1998). It also demonstrated that vigorous physical activity was not necessary in order to achieve these health benefits. The Honolulu Heart Programme

supported this finding in a study investigating longevity in men aged between 61 and 81 years, through regular walking (Hakim, Petrovitch and Burchfield, 1998). A further finding of Hakim's study was that no additional health benefits were gained through increasing physical activity beyond a moderate intensity. Further findings from data of 2678 men aged 71-93 years with no pre-existing CHD revealed that over a period of 2-4 years, men who walked <0.25 miles per day had twice the risk of CHD compared to those men who walked >1.5 miles per day (5.1% vs 2.5%, $p<0.01$). Those who walked between 0.25 -1.5 miles per day were significantly at increased risk of CHD compared to those walking for a longer duration.

1.2.4 *Physical activity and stroke*

Stroke is a major public health concern in developed countries. It is the third biggest cause of death in the UK and the largest single cause of severe disability (DH, 2007b). Risk reduction of stroke associated to physical activity has been less researched than CHD, although similar conclusions have been drawn (Hu Sigal, Rich-Edwards and Colditz, 1999; Lee and Blair; 2003; Wannamethee and Shaper, 1992). There is evidence from both narrative reviews and meta-analysis that physical activity may modify risk factors for stroke, for example hypertension, and in addition may reduce the risk of stroke more directly, although these findings are inconsistent (Kohl, 2001; Hu et al, 1999; Lee, Folsom and Blair; 2003).

Studies carried out in this area are similar to that of CVD and CHD in that the study design and populations investigated are similar. Lee et al (2003) conducted a systematic review to examine the relationship between physical activity and the risk of stroke using a meta-analytic approach. It showed that the risk of stroke incidence or mortality of moderately or highly active individuals was lower compared to individuals with low levels of activity. The risk of stroke was 20% and 27% lower respectively for moderately and highly active individuals. Kohl (2001) reviewed fifteen major studies (sixteen publications)

that provided evidence of the relation of physical activity to stroke risk and a physical activity dose-stroke response. Two were of a case-comparison design, and thirteen used a prospective design with follow-up periods ranging between five and twenty-six years. The outcomes measure used for seven of the studies were fatal stroke, one on non-fatal stroke and the remainder were a mixture of fatal and non-fatal outcomes. Four of the studies focused on the relationship among women. Six of the studies provided evidence of a dose response relationship, eight provided no support for a dose response relationship and two provided mixed support. These findings suggest that there may be a dose-response relationship between physical activity and risk of stroke, but the findings are inconclusive (Kesaniemi et al, 2001). The exact mechanisms to explain the role of physical activity in reducing the risk of stroke also remain unclear.

1.2.5 *Physical activity and secondary prevention of CHD*

Since the 1960's, physical activity has been promoted for those with established coronary heart disease. Its promotion has been expanded to include a range of other disorders, including heart failure, left ventricular dysfunction and a range of cardiac surgical procedures and interventions, for example, coronary artery bypass graft surgery, coronary angioplasty, valve replacement and implanted cardiac devices (Speed and Shapiro, 2000).

The aim of secondary prevention is to halt the progression of CHD. Findings of meta-analysis of randomised controlled trials on the effects of cardiac rehabilitation programmes following myocardial infarction (heart attack), which include a physical activity component of moderate intensity, showed a reduction in mortality of at least 20% (Froelicher et al, 1984; Bethell and Mullee, 1990; Carson et al, 1982). The therapeutic effect of physical activity for this population has been mainly focused on coronary artery disease, with evidence for a positive effect on blood pressure, weight, improved lipid profile, and psychological well-being (Speed et al, 2000). There is also evidence that increases in anginal

threshold can be achieved through regular physical activity (Redwood, Rosing and Epstein, 1972; Ades, Grunvald, Weiss and Hanson, 1989).

1.2.6 *Physical activity and CVD risk factors*

The protective factors of participation in regular physical activity are thought to reduce the risk of CVD through numerous favourable effects on other modifiable risk factors. These include effects on blood lipid profiles, blood clotting factors, weight reduction and weight management, glucose tolerance and insulin resistance (DH, 2004a).

1.2.7 *Physical activity and diabetes*

Physical inactivity is a major risk factor for the development of type II diabetes. People who are physically active have a 33-50% lower risk of the disease compared to their inactive counterparts (DH, 2004a). In addition, diabetes significantly increases the risk of CHD. Evidence from laboratory studies demonstrate that regular physical activity both prevents and manages type II diabetes, especially in those who are obese or who have impaired glucose tolerance. The proposed mechanism for this effect is through increases in insulin sensitivity and improved glucose tolerance through various pathways (Fentem, 1994). The Nurses Health Study, a large prospective study, examined the relationship of total physical activity and the incidence of type II diabetes in women and compared the benefits of walking versus vigorous activity (Hu et al, 1999). Seventy thousand, one hundred and two women aged 40-65 took part in the study, which was prospective in design and all were free from diabetes, CVD and cancer at baseline in 1986. One thousand, four hundred and nineteen incidents of type II diabetes were found. The results revealed that both moderate and vigorous activity, of similar energy expenditure, were associated with significant decreases in the risk of type II diabetes over an eight-year follow-up period. Despite the overwhelming evidence on the role of physical

activity in the management of type II diabetes, it is currently an under utilised therapy (ACSM, 2000).

1.2.8 *Physical activity and hypertension*

Regular physical activity can both prevent and treat hypertension (DH, 2004a; Whelton, Chin, Xin and He, 2002; Hagberg, Park and Brown, 2000; Kesaniemi et al, 2001). Findings of randomised controlled trials suggest that in approximately 75% of people with hypertension, reductions in systolic and diastolic blood pressures of up to 11 mmHg and 8 mmHg respectively can be achieved through participating in moderate intensity physical activity (Hagberg et al, 2000). A systematic review of fifty-four trials (2,419 participants) using meta-analysis found that regular moderate intensity aerobic activity was associated with significant reductions in systolic and diastolic blood pressure of 3.8 mmHg and 2.6 mmHg respectively in both previously sedentary hypertensive and normotensive participants from diverse ethnic populations (Whelton et al, 2002). Conclusion drawn from the review recommend that physical activity should form part of lifestyle interventions to both prevent and treat hypertension. The exact mechanisms responsible for reductions in blood pressure as a result of regular physical activity remain unclear.

1.2.9 *Physical activity and hyperlipidemia*

It is estimated that over 46% of deaths caused by CHD are due to hyperlipidemia, an elevation of lipids (fats) in the bloodstream. The majority of evidence supports the hypothesis that regular physical activity can prevent hyperlipidemia from developing and in addition can improve blood lipid profiles, with the most common change observed in HDL cholesterol, which protects against CHD (Kesaniemi et al, 2001; Leon and Sanchez, 2001; Durstine et al, 2001). Less consistent evidence for changes in total cholesterol, LDL cholesterol and triglycerides are observed (Kesaniemi et al, 2001; Leon et al, 2001). The exact mechanisms to explain these changes remain unclear.

1.2.10 *Physical activity and overweight and obesity*

Both overweight and obesity are associated with an increased risk of numerous health problems including cancer, type II diabetes, heart disease, diabetes and other debilitating conditions, which contribute to a reduced life expectancy and impact negatively upon quality of life (WHO, 2003). Obesity can also cause psychological and social problems, particularly in children. Estimates suggest that if appropriate action is not taken, by 2050 nearly 60% of the UK population could be obese (Foresight, 2007).

Food intake in the UK has fallen, although obesity rates have increased, indicating that leading a sedentary lifestyle is an important factor in preventing and managing obesity (Prentice and Jebb, 1995). The effect of physical activity on weight loss is modest and the mechanisms explaining this effect relate to direct increases in energy expenditure. In addition, physical activity preserves lean mass, a determinant of resting metabolic rate, which in turn increases the metabolic rate, resulting in more calories being expended (DH, 2004a).

1.2.11 *Physical activity and cancer*

In excess of 120,000 people die from cancer each year, and over 220,000 people are diagnosed with the disease. The most common cancers are colon, breast, prostate and lung cancer, which account for half of all cases. Physical activity is associated with an overall reduced risk of cancer (Thune and Furberg, 2001), and has been shown to have an indirect effect through its role in the prevention of obesity, which in the US has been estimated to result in 10% of all-cause cancer (DH, 2004a). Studies have shown that active individuals are less likely than inactive individuals to develop colon or breast cancer (Thune et al, 2001; Dorne, Vena, Brasure, Freudenheim and Graham, 2003). For example, Slattery and Potter (2002) demonstrated that active individuals have approximately a 40% reduced risk of colon cancer compared to their inactive counterparts, and that these effects are independent of diet and body mass index. There is also

evidence that physical activity has a protective effect on the risk of breast cancer in both pre and post menopausal women (Dorn et al, 2003). However, the evidence for physical activity being protective for lung, prostate, testicular, endometrial and ovarian cancer is inconsistent (DH, 2004a).

1.2.12 *Physical activity and mental health*

In Britain, approximately one in six people experience mental health problems at any one time (The Office for National Statistics, 2002). To-date little attention has been paid to the influence of physical activity on mental health. Of the research available, the vast majority have examined its role in alleviating anxiety and depression among non-psychiatric populations (Plante, 1996). There is, however, some evidence that physical activity can also be an effective additional treatment for serious mental illness, such as psychosis (Faulkner & Biddle, 1999; Chamove, 1986). The mechanisms mediating the psychological effects of physical activity are unknown, although several hypotheses have been suggested, namely physiological, biochemical and psychological (Fox, 2000; DH, 2004a).

1.3 **Changes in physical activity levels**

Over the past few decades physical activity as part of daily living in England has declined and reflects modern day living. For example, in westernised countries there has been a reduction in the need for hard physical activity to carry out everyday activities such as shopping and work-related physical tasks, partly due to the introduction of labour saving electronic devices to undertake such tasks (DH, 2004a). In addition, evidence from the National Travel Survey suggests that in England commuting by cycling or on foot has declined by 26% over the past 25 years, resulting in a difference of 66 miles being walked per year between 1975-1976 and 1999-2001 (Department of Transport, 2001). However, a slight increase is evident in the number of people in Great Britain who participated in

leisure pursuits involving physical activity between 1987 and 1996 (Office for National Statistics, 1998).

In children, data collected between 1997 and 2002 suggest that no increase or decrease in activity levels have occurred. However, data suggests that the percentage of children who participate in at least 30 minutes of activity each day has increased, namely by 9% for boys and 14% for girls (DH, 2004c).

1.4 Current Recommendations

1.4.1 Adults

Prior to 1996 the physical activity message being promoted was for adults to participate in 20-60 minutes of vigorous activity three or more times per week, with the emphasis on cardiovascular training (ADNFS, 1992). However, in light of the above evidence for moderate intensity physical activity, the Department of Health (1996) issued a strategy statement on physical activity, recommending that for general health every adult should achieve a total of at least 30 minutes a day of at least moderate intensity physical activity on five or more days of the week. This can be achieved by doing all the activity in one bout, or through several short bouts of 10 minutes or more, and through participating in lifestyle activities, such as brisk walking, structured activity or sport, or a combination of these.

This level of activity is sufficient to reduce the risk of premature death from CVD, type II diabetes, some cancers, and can also improve mental health. However, it is recognised that for many people 45-60 minutes a day of moderate intensity physical activity may be needed to prevent obesity. In addition, people who have been obese and who have successfully lost weight may need to do 60-90 minutes of activity daily to maintain their weight loss (DH, 2004a).

However, those already taking some vigorous intensity physical activity should continue to participate in vigorous physical activity for at least 20 minutes, three times per week (Haskell, Lee, Pate, Powell and Blair, 2007). The recently introduced physical activity guidelines have shifted the focus from vigorous to moderate intensity physical activity, in an attempt to increase participation rates. The rationale for doing so was largely influenced by two factors. Firstly, there is now a body of evidence demonstrating that participating in some physical activity is better than doing nothing at all, and that vigorous activity is not a reasonable goal for sedentary populations. Secondly, that high intensity physical activity may be partially to blame for high attrition rates, due to the experience of vigorous activity being evaluated negatively (Hall, Ekkekakis and Petruzello, 2002). Accordingly, it is suggested that moderate intensity activity would be more realistic and more manageable for the general population to achieve and maintain, given the high proportion of people who are insufficiently active. It has also been proposed that such activity may be more enjoyable and or more tolerable for this target group. As a result it has been tentatively suggested that such activity would more likely be continued (Hall, et al, 2002, pg.48).

1.4.2 Children

Children and young people should be physically active for a total of at least 60 minutes everyday of at least moderate intensity. At least twice a week, activity that improves bone health, muscle strength and flexibility should be undertaken.

1.5 Moderate Intensity Physical Activity

Moderate physical activity can be subjectively described, based on an individual's perception of their exertion rate, as one that makes you feel:

- an increase in breathing rate

- an increase in heart rate
- a feeling of increased warmth

As fitness levels differ between individuals, the level of intensity required to achieve activity at a moderate intensity will vary. For example, someone who is sedentary may only have to walk a short distance to experience the above feelings. However, an individual who is very active may have to run before they experience such feelings.

Intensity can also be measured using metabolic equivalents (METs). One MET is equivalent to an individual's metabolic rate (rate of energy expenditure) at rest. MET values are given to activities to indicate their intensity and are expressed in multiples of resting metabolic rate. Moderate intensity is generally defined as expending between 3 and 6 METs or expending 5-7 kilocalories per minute (USDHHS/CDC, 1999).

Physical activity promotion has been given much attention in the media, and great efforts have been made to raise its profile. However, less attention has been given to determine whether the members of the general public actually understand the current physical activity guidelines, focusing on moderate intensity physical activity. An RCT was conducted in the US to examine whether inactive women aged 25-61 years, after being exposed to the US physical activity guidelines, were more knowledgeable of the recommendations and able to demonstrate what constitutes moderate intensity physical activity (Rice et al, 2008). The study hypothesised that participants would be unable to demonstrate a moderate intensity walking pace without having first practised. Participants were assigned to either an information only group or to an information plus walking practice group. The information given was a written brief description of the physical activity recommendations, in a format similar to that delivered in the mass media. The study findings revealed that participants in

the information plus walking practice group were more able to demonstrate a moderate intensity walking pace post-intervention, whereas a smaller proportion of participants in the information only group were able to do so. In addition, participants in both groups increased their knowledge of the recommendations having read a description of the intensity of physical activity required to meet the recommendations. The author concluded that by simply communicating the physical activity recommendations might not be sufficient for people to understand the frequency and intensity of activities to enable such activities to be enacted. They go on to suggest that practice sessions might be an effective means for inactive people to understand the health benefits offered by moderate intensity activity and to facilitate behavioural change by putting the recommendation into practice.

1.6 The moderate vs vigorous physical activity debate

The sole promotion of moderate intensity physical activity since 1995 has recently been challenged. Several researchers have suggested that the benefits gained from moderate intensity physical activity have been exaggerated (O'Donovan and Shave, 2007; Williams, 2001), to the extent that the vast majority of adults wrongly believe that greater health benefits can be gained from moderate than vigorous activity (O'Donovan et al, 2007). Most evidence concludes that vigorous levels of activity confer greater health benefits than activities of a moderate intensity (DH, 1996; DH, 2004a). O'Donovan et al (2007) conducted a nationally representative survey of 1191 people aged 16-65 years to examine the views of British adults on the health benefits of moderate and vigorous physical activity. The study findings concluded that 56% of men and 71% of women aged 25-65 years believe that moderate intensity physical activity is more conducive to health. This view has changed from 1990 when the Allied Dunbar National Fitness Survey (1992) found that approximately 90% of adults believed that sport and more formal and structured activities were of importance for health. O'Donovan et al (2007) question why policy makers in Britain have failed to endorse vigorous activity, and in doing so have failed to

offer individuals information to enable them to make informed choices about physical activity. In light of this, they recommend that physical activity guidelines should be amended due to the incorrect views held by the public. However, it is important to remember that the vast majority of the adult population are inactive and so achieving vigorous activity levels is likely to be unachievable by most and is also unlikely to be maintained over the longer-term.

1.7 The Scale of the problem

Despite the well-documented evidence that physical activity is beneficial for health, the vast majority of adults in the UK and in many other countries are not active at levels to confer health benefits. In 2006 one-third of adults in England led sedentary lifestyles (participated in less than 30 minutes of moderate intensity physical activity per week), equating to only 40% of men and 28% of women meeting the current recommended guidelines (DH, 2008). This is compared to 22% of the adult population who smoke, 59% with raised cholesterol levels (defined as cholesterol levels of 5.0mmol/l and above) and 29.5% with hypertension (defined as a systolic blood pressure of 140mmHg or over or a diastolic blood pressure of 90mmHg or over) (BHF Statistics, 2008), which means that the UK is a long way behind countries where participation levels are high. For example, in Finland physical activity participation rates are at approximately 80%, with rates increasing with advancing age (DCMS/SU, 2002). Interestingly, a National Survey conducted in the UK found that 80% of people perceived themselves to be physically active (ADNFS, 1992).

Physical activity levels decline rapidly with age, with only 17% of men and 13% of women aged 65-74 active at the recommended levels in the UK. Worryingly, of those aged over 75 years, these figures drop to 8% of men and 3% of women respectively (DH, 2003). Encouragingly, recent figures estimate that between 1997 and 2006 levels of activity amongst adults increased slightly from 32% to 40% of men and 21% to 28% of women meeting the current recommended physical activity guidelines (DH, 2008). It is clear that a large percentage of the

population would benefit from becoming more active given that physical activity levels are so low.

Activity levels amongst children are also a cause for concern. The Health Survey for England (2002) found that approximately two-thirds of boys and girls aged 2-11 years achieve at least 60 minutes of moderate intensity physical activity daily. However, in girls this level of activity declines steadily from 10 years of age to about half by the age of 15.

1.8 Policy Context

Physical activity is a key component of the government's commitment towards improving health, and accordingly numerous national government policy documents have included a focus on physical activity. Many have been produced by The Department of Health and by other departments, such as the Department of Culture, Media and Sport and the Department for Education and Skills. The main policy drivers in this area include:-

1.8.1 National Service Frameworks (NSF's)

NSFs set out priorities, targets, standards and milestones for the care of particular target groups, or for the prevention and treatment of specific diseases. Physical activity is a key aspect of several NSFs, including those covering CHD, cancer (NHS Cancer Plan), older people, diabetes, children, young people and maternity services and mental health.

1.8.2 NSF for CHD

The NSF for CHD (DH, 2000a) requires the National Health Service, primary care trusts (PCTs) and local authorities to have agreed and be contributing to the delivery of local programmes of effective policies on increasing physical activity.

1.8.3 NSF for Diabetes

The NSF for Diabetes (DH, 2001a) requires the NHS to develop, implement and monitor strategies to reduce the risk of developing type II diabetes and reduce the inequalities in the risk of developing the condition, which include increasing levels of physical activity.

1.8.4 NSF for Older People

The NSF for Older People (DH, 2001b) states the evidence for physical activity for older people. A key recommendation is that the NHS and local authorities commit to ensure that older people have fair access to programmes of disease prevention and health promotion, including physical activity.

1.8.5 NSF for Mental Health

The NSF for Mental Health (DH, 1999) makes reference to the evidence demonstrating the role of physical activity in improving mental health, however it does not outline specific milestones for physical activity.

1.8.6 NHS Cancer Plan

The NHS Cancer Plan (DH, 2000b) sets out key actions required to improve cancer prevention and screening services, cut waiting times for patients, improve treatment and palliative care services, and to improve cancer research. It highlights the importance of physical activity in maintaining good health and preventing cancer and endorses commitment for action on physical activity.

1.8.7 NSF for Children, Young People and Maternity Services

The NSF for Children, Young People and Maternity Services (DH, 2004d) is a ten-year plan which sets out standards for health and social care services for

improving health and support for children. Promoting health and well-being, identifying needs and intervening early is one of the core standards of the NSF. It calls for the health and well-being of children and young people to be promoted and delivered through a co-ordinated programme of activity, one of the elements being healthy lifestyles, such as physical activity.

1.8.8 Game Plan: a strategy for delivering Government's sport and physical activity objectives (2002)

In 2001, the Department for Culture, Media and Sport and the Strategy Unit were jointly commissioned to develop the Game Plan (2002), a strategy for delivering the Government's sport and physical activity objectives. A key focus of the Game Plan is on the health benefits gained through regular participation in physical activity. The strategy covers topics including why sport and physical activity should be invested in by the Government, the current position of sport, a 20 year vision for physical activity and sport, improving international sporting success and increasing participation. The report recommends that the Government use two main approaches, namely increasing participation in sport and physical activity and improving and sustaining improvements in success at international competition.

1.8.9 Choosing Health: making healthier choices easier (2004b)

The Choosing Health White Paper was published in November 2004. Choosing Health proposes how the government will make it easier for people to make healthier choices. Six key priority areas were identified, namely tackling obesity, reducing numbers of people who smoke, reducing harm and encouraging sensible drinking, improving sexual health, improving mental health and well-being and tackling health inequalities.

It outlines the Government's commitment to physical activity and how it will work with a range of bodies to promote physical activity to improve the health of the population, in particular in addressing obesity and the health risks associated with this condition. The document also sets out the Government's aim to reduce barriers to participation in physical activity, including reducing the costs of accessing physical activity provisions, improving access to high quality green spaces, and encouraging active travel, namely walking and cycling.

1.8.10 Choosing activity: a physical activity action plan (2005a)

This plan outlines the Government's plans to promote physical activity as a cross-government issue and a priority, across a range of departments and organisations in England. The document provides a summary of how the commitments set out in the Choosing Health: making healthier choices easier (2004) white paper, together with other action across government will be realised.

1.8.11 Delivering Choosing Health (2005b)

Delivering Choosing Health clearly sets out the agencies that will be held to account for the delivery of the various strands of the White Paper. This plan summarises how the Department of Health and the NHS within the context of government policies will help people make more healthy choices and reduce health inequalities. In addition, it outlines the key priorities for delivery at a national, regional and local level, what will be done and when. As part of tackling obesity, the plan sets out its priority to include physical activity as a means for reducing the prevalence of obesity. It also sets out plans to increase physical activity opportunities for young people and promoting physical activity amongst older people.

1.8.12 The NHS Plan (2001d)

The NHS Plan outlines the plans to invest and improve the National Health Service. The Plan highlights the importance of physical activity and states its commitment to develop local action to tackle obesity and physical activity.

1.8.13 Our Health, Our Care, Our Say: A New Direction for Community Services (2006b)

The White Paper was published in January 2006 and sets a new direction for the health and social care system, proposing that there will be a change in the way that services are delivered, ensuring that they are more person-centred. It outlines the improvements that will be made to health and social care services, why such changes are necessary and the actions required to ensure that these changes take place. Physical activity is highlighted as a means to improve health, with specific reference made to its role in contributing to the Government's target to reduce obesity and to improve mental health. Physical activity is also recognised for its role in primary prevention and describes new service additions to the NHS, namely exercise referral schemes.

1.8.14 At Least Five A Week: Evidence on the impact of physical activity and its relationship to health (2004a)

In April 2004, the Chief Medical Officer published the report 'At Least Five a Week: Evidence on the impact of physical activity and its relationship to health'. The report details the latest evidence of the benefits of physical activity for health, highlighting the public health implications associated with physical inactivity.

1.8.15 Healthy Weight, Healthy Lives: A Cross-Government Strategy for England (2008)

This strategy is the Government's response to the Foresight report (2007), a project which looked at the action needed to tackle obesity in the UK over the next 40 years and which estimated that based on current trends, by 2050 60% of the UK population will be obese. The strategy sets out the first stages of a long-term programme to assist people to make healthier choices regarding physical activity and food to enable a healthy weight to be achieved and maintained, with the initial focus being on children. It also sets out a vision of the action required to achieve the government's new ambition: of being the first country to "*reverse the rising tide of obesity and overweight in the population by ensuring that all individuals are able to maintain a healthy weight. Our initial focus is on children: by 2020 we will have reduced the proportion of overweight and obese children to 2000 levels*" (HM Government, 2008, pg. v). This ambition forms part of the government's new Public Service Agreement (PSA) on child health and well-being (HM Government, 2007). Progress made will be assessed annually, in addition to the latest evidence and trends and recommendations will be made regarding actions needed for the future.

1.9 **Costs associated with physical inactivity**

The costs associated with physical inactivity are immense. Physical inactivity is associated with direct costs to the health care service and indirectly, for example, through sickness absence from work resulting in production losses, which place a further financial burden on the health care system and on the economy as a whole. Shore, Prasad and Zroback (1989) demonstrated a positive link between increased physical activity and absence from work due to sickness. Costs of inactivity in England are £8.2 billion annually (DCMS, 2002), which excludes the contribution of inactivity to obesity, which has been estimated at £2.5 billion annually (Nat. Audit Office, 2001). It has been estimated that in western countries, 2.5% of national health costs are incurred through inactivity (Katzmarzyk, Gledhill and Shephard, 2000).

CHD is the biggest cause of death in the UK, and costs associated for treating the disease are high. CHD costs the UK approximately £7.9 billion per year, of which 45% is associated with direct health care costs, 40% to reduced productivity and 16% to informal care. (BHF Statistics, 2008). Further estimates indicate that stroke care costs the health service 2.8 billion per year, and for each individual who has a stroke the cost to the health service totals £15,000 over a five year period. Theoretical estimates suggest that if levels of activity were increased by 5%, that £300 million per year could be saved (DCMS, 2000). Scottish estimates suggest that a 5% increase in physical activity levels in adults would reduce the number of premature deaths in Scotland from CHD, stroke and colon cancer by 157 over a five year period, and further that the cumulative total of years saved would be 2,839 life years, assuming that a normal life expectancy would be achieved by each death prevented (Scottish Government, 2003).

A recent study criticised the Department of Culture Media and Sports Strategy Unit on their estimates of costs of physical inactivity, claiming that they were not evidence-based (Allender, Foster, Scarborough and Rayner, 2007). Using the methods of Rayner (2005) who provided estimates of the financial and ill-health burden related to diet in the UK, Allender et al (2007) applied these methods to estimate the burden of physical ill health related to physical inactivity in the UK. The method used is outlined briefly below.

1. Identification of disease where physical inactivity is a risk factor;
2. Calculation of the total numbers of deaths and the disability adjusted life years lost for these diseases;
3. Identification of the population attributable fractions (PAF's) for each disease;

4. Application of these PAF's to NHS cost data, to calculate the direct costs of physical inactivity to the NHS.

The findings revealed that physical inactivity was responsible for 3% of morbidity and mortality in the UK, and that one-third of deaths in the UK could be partly reduced by increased levels of physical activity. Further estimates of the direct costs to the NHS totalled £1.06 billion.

1.10 Issues in exercise/physical activity adherence

To date studies have failed to determine who will be physically active, or for how long. It is suggested that of those who adopt a physical activity programme, approximately 50% will have dropped out in the first 6 months, with the highest percentage occurring in the first 3 months (Dishman, 1988; Robison and Rogers, 1994). Similar levels have been reflected in studies of cardiac rehabilitation patients (Oldridge, 1984a).

Exercise psychology, developed to address the behavioural and psychological implications of participation in physical activity, is an important dimension of exercise science, and the body of literature in this area has grown rapidly (Dishman 1988; 1994). It combines exercise science with psychology incorporating health education, behavioural psychosomatic medicine, sports psychology, clinical and counselling psychology and nursing, all of which have made significant contributions to the growth of knowledge in this area (Willis & Campbell, 1992).

A consensus on the definition of the term exercise adherence has yet to be agreed upon. It is commonly used to refer to the extent to which an individual participates in a program after the individual has committed to it (Dishman, 1994). Willis and Campbell (1992) define the term as 'sticking' or 'conforming'

to standards, whereas Oldridge (1984a) and Wankel (1984) define it as attendance, but take into account reasons given for absence, such as illness to more accurately reflect adherence. A slightly different perspective was taken when described as 'the fulfilment of pre-determined goals' by Robison and Rogers (1994). However, by simply defining adherence as attendance, given that a standardised definition does not exist, at what point should someone be considered to have failed or dropped out? Added to this, is the fact that most research has focused on adherence to formal exercise programmes, largely ignoring unstructured physical activity such as walking or cycling, or participation outside of a supervised setting.

Adherence to exercise referral schemes is typically poor, with less than half of people referred onto such schemes still active at ten weeks (Jones, Harris, Waller and Coggins, 2005; Taylor, 1996). Previous research findings have suggested that the variables self-efficacy, expectations and stress may be important predictors of exercise adherence, although the findings have been inconsistent. Jones et al (2005) conducted a UK study to examine the role of participant expectations, self-efficacy, stage of change and psychological well-being on adherence to an exercise referral scheme lasting twelve weeks. Prior to starting the exercise programme the activity levels of the participants was low, although their expectations of what they would gain from participating in the 12-week programme was high, and included improvements in fitness as well as in other areas such as confidence and happiness. The study findings revealed that participants with unrealistic expectations of the scheme dropped out. No association was found between adherence, stage of change and gender differences. In addition, younger participants were less likely to complete the 12-week exercise programme compared to older participants. The authors concluded that although self-efficacy and stages of change factors effectively predict adherence in healthy populations, that this may not be the case for patient populations with little or no experience of exercise and that factors of expectations and psychological well-being may prove to be more important. As the Self-Determination Theory (SDT) (Deci and Ryan, 1985) suggests that

individuals will be more likely to be successful in changing their behaviour if they are intrinsically motivated, the authors suggest that schemes based upon this theoretical framework could advance knowledge in this area.

The body of literature in this area suggests that adherence is influenced by a host of factors: personal, demographic, physical, psychological, social/environmental and program factors (Robison and Rogers, 1994; Willis and Campbell, 1992). Of these, social/environmental are suggested to be the most significant and amenable to change, encompassing variables such as social support, convenience and time (Willis and Campbell, 1992). Social support (spouse support in particular) and time are also thought to be powerful determinants of exercise adherence (Rejeski and Kenney, 1988).

1.10.1 Personal Factors

Factors include exercise history, recent exercise behaviour, smoking status, occupation, knowledge and beliefs/attitudes regarding the benefits of exercise. Personal factors associated with decreased adherence and increased dropout, include blue collar and smoker status. Multivariate analysis determined that 58% of non-adherers were smokers and by adding the variable blue collar status, dropout increased to 69%, and by adding a further variable, namely inactivity, increased the success rate of predicting dropouts to 95% (Oldridge, 1979). However, it is suggested that past exercise behaviour is the best predictor of future exercise behaviour, and if an individual has a recent previous exercise history, they are more likely to exercise, in addition to having active as opposed to inactive pursuits. Some evidence suggests that if individuals are knowledgeable of the benefits of exercise that they are more likely to participate (Weinberg and Gould, 2003; Dishman, 1994). However, contradictory evidence was found in the Allied Dunbar National Fitness Survey (ADNFS) (1992), in that despite being aware of the benefits, the vast majority of individuals were still inactive.

1.10.2 Demographic Factors

These factors include socioeconomic factors, levels of education, gender, age and marital status. Taira, Safron, Seto, Rogers and Tarlov (1997) found that unhealthy behaviours were more common amongst those on low incomes, in that they were more likely to be obese, smoke and were less physically active. Physical inactivity declines rapidly with age (BHF Statistics, 2008). However decreased activity with age does not necessarily mean that older adults are more likely to drop out of a physical activity programme, and the literature in this area is equivocal. Campbell et al (2001) found that people of different ages were active for different reasons, in conducting a study to examine factors likely to motivate older people to exercise. The findings revealed that the most important factor was that older people aged 45-74 years participated for mental health benefits. The greatest difference between groups was that significantly fewer older adults believed that being active could help them to have fun ($p < .001$). A weakness of the study was that participants were categorised by age into only two groups, which may not have accurately reflected different motivations across age groups.

Several researches have found that younger participants are less likely to adhere to exercise than older participants, possibly due to other commitments (Lord and Green, 1995; Jones et al, 2005). Irrespective of age, men are slightly more active than women across all age ranges (BHF Statistics, 2008). Across studies, similar rates of adherence across genders have been found, suggesting that gender differences may not be a factor in adherence, for example, Jones et al (2005) found that gender differences were not associated with adherence.

Marital status is associated with many factors including education, age and income and is not considered to be a good indicator of adherence. In addition, despite suggestions that physical activity participation is associated with educational level, few studies have examined how it affects adherence to physical activity (Willis & Campbell, 1992).

1.10.3 Physical Factors

Physical factors associated with an increase in dropout rates include the presence of hypertension (Oldridge and Jones, 1983; Blumenthal et al, 1982), and hyperlipidemia (Blumenthal et al, 1982). In addition, overweight has been found to be associated with dropout (Jones et al, 2005). Studies have consistently demonstrated that angina is associated with a higher dropout rate. This is because angina is exacerbated by exercise and can make participation problematic (Oldridge, 1984b). However, findings in this area are largely inconclusive (Willis and Campbell, 1992).

1.10.4 Psychological Factors

1.10.5 Self Efficacy

The findings of studies examining the role of psychological factors in predicting exercise adherence are inconsistent. The effects of a range of psychological factors on exercise adherence have been examined, including self-efficacy, personality and motivation. Dishman (1991) concluded that self-efficacy was a poor predictor, as did Jones et al (2005) who found no association with adherence. This contrasts with the findings of the Allied Dunbar National Fitness Survey (1992) who found that the beliefs held about the ability to be physically active is an important factor in adherence. The study revealed that low self-efficacy (eg. not being the “sporty type”) was identified as a major barrier to participation in exercise amongst women. Ryan, Frederick, Lipes, Rubio and Sheldon (1997) found that individuals who believed in their ability to exercise were generally successful and further, that those with high intrinsic motivation as opposed to extrinsic motivation were more likely to adhere than those with low intrinsic motivation.

1.10.6 Personality

Cattell's 16 Personality Factor, the Minnesota Multi-phasic Inventory and the Self Motivation Inventory have been used to determine the type of personality that would most likely adhere to an exercise programme (Willis and Campbell, 1992). However, inconsistent results have been found. For example, in a study of cardiac rehabilitation patients, Oldridge, Wicks, Hanley, Sutton and Jones (1978) found patients who dropped out of the programme had significantly more type A characteristics than patients who successfully completed the programme. Similar findings were observed in male participants only, in a study of healthy adults conducted by Shepherd and Cox (1980). The observed low attendance rates in males were suggested to be due to time conflicts associated with senior roles held by the participants, and further that those with a type A personality were more likely to be appointed in high positions and have more work commitments which as a result might have been a barrier to attending the exercise programme.

1.10.7 Motivation

A self-motivated personality, defined as a having the nature to persevere, has been studied in relation to exercise adherence. It was hypothesised that motivation could be reliably measured as a stable personality characteristic that relates to adherence, which lead to the development of the Self-Motivation Inventory (SMI). Knapp, Gutman, Foster and Pollock (1984) used this tool to predict adherence to the training regime of skaters' scores on the inventory. However, other studies have not supported the self-motivation construct as predictive of exercise adherence, with some not only failing to predict adherence, but also that the adherers had lower SMI scores. In addition, two studies by Wankel, Yardley and Graham (1985) also failed to find a relationship between self-motivation and attendance in exercise programmes.

1.10.8 Social/Environmental Factors

These factors are seen as most the most significant and include variables such as social support, convenience and time (Willis and Campbell, 1992).

1.10.9 Social support

Social support from a spouse is thought to be a powerful determinant of adherence. Heinzelmann and Bagley (1970) found that a higher level of adherence when positive attitudes (80% adherence) as opposed to negative or neutral attitudes (40%) were expressed by wives towards their husband's participation in an exercise programme. These findings are supported by Oldridge and Jones (1983), who demonstrated that dropout rates for patients whose wives held negative attitudes towards the exercise programme, or who were uninterested, were three times that of patients whose wives were supportive of the exercise programme. There is less evidence to support the effect of support from other family members, although it is hypothesised that it will increase an individual's level of adherence to exercise (Willis and Campbell, 1992).

1.10.10 Time

Lack of time is one of the most frequently reported reasons for not being physically active (ADNFS, 1992), and for dropping out of an exercise programme (Dishman, 1994). However, it has been suggested that this may in fact reflect a lack of interest or commitment to physical activity and so putting the reason for non-participation down to lack of time may be more socially acceptable.

1.10.11 Program Factors

Several aspects related to how a program is organised and conducted have been shown to affect adherence, such as exercise intensity, type of exercise, timing of sessions and the effect of the exercise leader in structured programmes.

1.10.12 Moderate intensity physical activity

Study findings suggest that moderate intensity physical activity is better tolerated and therefore is more likely to be enjoyable than high intensity activity (Brewer, Manos, McDevitt, Cornelius and Van Raalte, 2000) and as a result, is more likely to be continued than high intensity activity (National Institute of Health Consensus Development Panel on Physical Activity and Cardiovascular Health, 1996). This notion is supported by Hall et al (2002), who conducted a study to examine the relationship between affective responses to increasing levels of physical activity and concluded that vigorous activity has a brief but significant negative impact on affect.

1.10.13 Timing and duration of physical activity

Duration of exercise is also important, as lack of time has been identified as a major barrier to exercise and the most frequently cited reason for non-adherence to exercise as well as the timing of sessions. However, Perri et al (2002) found support for physical activity programmes of a higher frequency which did not result in increased dropout.

1.10.14 Programme Leadership

The importance of the exercise programme leader has been positively associated with adherence, to the extent that it has been suggested that they are the most important variable affecting compliance. Equally, poor leadership can adversely affect a programme (Willis and Campbell, 1992).

1.10.15 Group Exercise

Research demonstrates that people have a preference for group exercise (particularly women) rather than exercising alone and that group exercise improves adherence. Heinzelmann and Bagley (1970) reported that 90% preferred to exercise in groups. However, Hillsdon, Thorogood, Anstiss and Morris (1995), found evidence to the contrary, in that greater increases in physical activity were achieved when activities were home-based rather than based in a facility and when the activity was unsupervised.

1.10.16 Limitations of exercise adherence research

Several limitations have been identified in research carried out in this area. Most of the literature concerns cardiac rehabilitation making generalisation of the findings somewhat difficult. Methodological issues have also been identified, the most significant being lack of consistency in the definition and measurement of the term adherence, which have included distance walked or jogged, attendance at exercise facilities and improved physical fitness (Leith and Taylor, 1992). In addition, difficulties in operationally defining and assessing the terms 'exercise' and 'physical activity' have also posed problems, which have lead to inconsistencies in research findings, making comparisons across studies problematic (Dishman, 1994). The validity of self-report methods used in these studies is a further limitation, which in some cases have been found to be inaccurate or purposefully falsified.

Studies have largely focused on adherence to structured exercise rather than unstructured physical activity, such as walking or cycling. Given the low levels of physical activity undertaken by the general population, there is a need for more of a focus on the study of more informal physical activity. In addition, few studies have been conducted which examine cross-cultural differences and to-date studies have largely excluded the physically challenged.

Exercise psychology is a relatively new discipline and prior to the introduction of this branch of psychology, studies in the area of physical activity have been largely atheoretical (Fox, 2000). A lack of longitudinal studies has also been identified, with most studies not exceeding one year, and many have used small and self-selected samples. Lastly, the older population are largely under represented in the literature and therefore require further systematic investigation.

No one single variable can reliably explain and predict exercise behaviour. Given the high levels of physical inactivity and the numerous health benefits to be gained from participation, identifying factors that are significantly associated with the adoption and maintenance of both structured and unstructured physical activity is a valuable line of research with practical benefits. The exercise adherence literature provides insight into promoting the continuation of exercise and contributes towards knowledge in this area.

1.11 Strategies for increasing physical activity – effectiveness

The evidence on effective strategies for increasing physical activity across all age groups is limited. In February 2005 The Health Development Agency (HDA) published the second edition of an evidence briefing on the effectiveness of public health interventions for increasing physical activity among adults. This took the form of a review of systematic reviews and meta-analyses of RCTs or quasi-experimental studies of public health and primary care interventions to increase physical activity in adults aged 16 years and over. The main outcome was self-reported physical activity. The review included published studies covering the period of 1996 to April 2004. A total of sixteen studies met the inclusion criteria and were included in the review. The reviews examined the effectiveness of interventions in health care settings (eight reviews), community settings (two reviews), workplace settings (two reviews), for older people aged 50 years and over (three reviews) and for black and minority ethnic groups and adults with physical limitations (one review).

1.11.1 Evidence for interventions in healthcare settings

The evidence briefing concluded that in healthcare settings, brief advice from a health professional, supported by written materials, is likely to be effective in producing short-term (6-12 weeks) effects on physical activity. In addition, longer-term (>8 months) changes in physical activity can be achieved through referring adults to an exercise specialist in the community. Lastly, primary prevention interventions with a single focus on physical activity, namely moderate intensity physical activity such as walking, were found to be effective in the short term (4-12 weeks) in increasing physical activity levels.

1.11.2 Evidence for interventions in community settings

From the findings of two systematic reviews, there was evidence that interventions targeting individuals in community settings are effective in producing short-term changes in physical activity, and are likely to be effective in producing mid to long-term changes in physical activity. Interventions based on theories of behaviour change, which teach behavioural skills and are person-centred, are associated with longer-term changes in behaviour than atheoretical interventions. Interventions that promoted moderate intensity physical activity, especially walking, and are non-facility based, are also associated with longer-term changes in behaviour. In addition, regular contact with an exercise specialist was found to be effective in sustaining changes in physical activity.

1.11.3 Evidence for interventions in workplace settings

The effectiveness of workplace interventions for increasing physical activity was found to be inconsistent.

1.11.4 Evidence for interventions for older people

There was evidence that a range of interventions for people aged 50 years and older were effective in producing short-term changes in physical activity, but there was limited evidence as to their effectiveness in producing mid to long-term changes. Interventions that used individual or group-based behavioural or cognitive approaches with a combination of group and home-based exercise sessions are equally effective in producing changes in physical activity. In addition, interventions promoting moderate intensity and non-endurance physical activity are associated with changes in physical activity. Interventions that provided support and follow-up are also associated with changes in physical activity.

1.11.5 Evidence for interventions for black and minority ethnic groups and those with physical limitations

One review examined the effectiveness of interventions in these groups and found no evidence in support of them.

1.11.6 NICE guidance: Four commonly used methods to increase physical activity

The National Institute for Health and Clinical Excellence (NICE, 2006) was requested by the Department of Health to produce guidance on methods used to increase the physical activity levels of the adult population. Four commonly used methods were selected, namely brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling.

Brief interventions in primary care refer to a broad range of approaches including opportunistic advice, discussion, negotiation or encouragement. The delivery of these interventions may vary greatly in that they may involve giving

basic advice to more lengthy person-centred approaches. Exercise referral schemes are programmes that direct individuals to a service that offers an assessment, a tailored physical activity programme, monitoring of progress and follow-up. These programmes may require attendance at a facility such as a leisure centre. Pedometers are devices used to calculate the number of steps walked. Pedometers were assessed regarding their effectiveness in increasing activity levels. Walking and cycling programmes were defined as organised walks or cycle rides.

Reviews of the effectiveness of the above four methods to increase physical activity were carried out by the NICE Public Health Collaborating Centre (physical activity). NICE concluded that there was insufficient evidence to support the use of pedometers, walking and cycling schemes and exercise referral schemes to increase physical activity. However, there was evidence that brief interventions were effective in increasing activity levels. NICE recommend that practitioners should identify inactive patients, assessed using the DH general practitioner physical activity questionnaire (GPPAQ) (DH, 2006c), and advise them of the current recommendations for physical activity. They further recommend that advice should be delivered using a person-centred approach and should be complemented with written information about the benefits of physical activity. In addition, NICE recommend that patients should be followed up over a period of three to six months.

1.11.7 NICE guidance on exercise referral schemes

Four RCTs met the criteria set by NICE, three conducted in the UK and one in Australia. One study was assessed as having fulfilled all or most of the criteria and the remaining three as having fulfilled none or few criteria. NICE found exercise referral schemes to be effective in the short term (6 to 12 weeks) but not in the long term (over 12 weeks) or over the very long term (over 12 months). NICE recommended that this method should only be endorsed if part of a properly designed and controlled research study to determine efficacy.

In March 2007, in response to NICE guidance on exercise referral schemes, the Department of Health issued a statement (best practice guidance) on this topic to clarify the opinion regarding the commissioning of ERSs in England, designed to be read in conjunction with NICE (2006) guidance in this area. The summary guidance stated the following (DH, 2007a, pg 1-2):-

“The DH urges commissioners, practitioners and policy makers to continue to provide high quality exercise referral schemes for their local population where these address:-

- The management of conditions, eg. type II diabetes, obesity and osteoporosis.
- Approaches specific to prevention or improving individual health conditions (eg. falls prevention), which fall outside the overarching advice to achieve 30 minutes moderate activity on at least five days a week.

Schemes should be commissioned and managed in accordance with the National Quality Assurance Framework for exercise referral in England.

Exercise referral schemes solely for the purpose of promoting physical activity (ie. where there is no underlying medical condition or risk) should only be commissioned or endorsed by commissioners, practitioners and policy makers when they are part of a properly designed and controlled research study to determine effectiveness”.

The best practice guidance clearly sets out the criteria used by NICE (2006) in their assessment of this method, stating that groups excluded from assessment

included the medical management of related conditions and approaches specific to prevention or to improve health conditions, which fall outside the general recommendations to achieve at least thirty minutes of moderate activity on at least five days of the week. To this end, DH guidance stated that exercise referral schemes falling outside of the scope of the NICE review were not affected by the NICE guidance. The DH ended their statement urging that these schemes continue to be provided in accordance with the National Quality Assurance Framework for exercise referral in England (DH, 2001c).

In closing their evidence briefing on the effectiveness of public health interventions for increasing physical activity among adults, the HDA (2005) explicitly stated that where there was no review-level evidence in support of a particular intervention, that this did not necessarily mean that there was absolutely no evidence of its effectiveness, nor that there was evidence that it did not work, but that there was no evidence from the systematic reviews that met the inclusion criteria. Agencies such as the NICE could take the same line as the HDA to avoid disinvestment in interventions that may be effective but for many reasons including a lack of funding to rigorously evaluate them, evidence may be inconclusive. This same view is reflected in the Foresight Report (Foresight, 2007), when referring to tackling obesity, in pointing out the high probability that interventions to prevent obesity, which would include interventions aimed at increasing activity levels, will need to take place in the absence of complete or perfect evidence. They further stated that the evidence base will need to be developed alongside the delivery of novel interventions and until then that they be informed by the available evidence and strengthened by expert opinion (Foresight, 2007, pg. 62). Interestingly, funding for medical research is typically allocated to medical interventions for disease. For example, in the UK only 0.5% of such funding is allocated to the development of behavioural interventions to promote health (POST, 2007), indicating that the balance of funding needs to be shifted.

1.11.8 Closing paragraph on physical activity

Based on the well-documented evidence of the benefits of regular participation in physical activity, it is clear that encouraging physically active lifestyles must form part of any strategy to improve the health of the population. This coupled with the low levels of activity levels in the UK have led to the health enhancing behaviour being described as ‘the best buy in Public Health for the West’ by Morris (1994), a prominent researcher in this field. On the strength of this, increasing physical activity levels has been suggested as having the greatest potential for reducing cardiovascular risk (Pender, Sallis, Long and Calfas, 1994; European Heart Network, 1999). This view was echoed by the Chief Medical Officer who stated that ‘there are few public health initiatives that have greater potential for improving health and well-being than increasing the activity levels of the England population’ (DH, 2004a, pg. 20).

1.12 Complexities of Behaviour Change

“Habit is habit, and is not to be flung out of the window by any man, but coaxed downstairs a step at a time” (Mark Twain)

1.12.1 Overview

Helping people to change health behaviour, such as physical activity, diet, smoking and taking medication is common practice for a range of practitioners across a range of settings, including primary care and in the community. Conversations about behaviour change can take place when discussing lifestyle changes needed to both manage and prevent a range of long-term conditions, for example, obesity, type II diabetes and CHD. However, accomplishing behaviour change is seldom easy and sustaining such changes is even more difficult, presenting major challenges for both practitioners and individuals alike.

It is often questioned why people think and behave as they do and many beliefs are held about what makes people ‘tick’. Understanding why, how and whom

may change has intrigued practitioners and researchers for decades. As a result, numerous psychological models and theories have been developed in an attempt to understand the phenomena of behaviour change. To-date no single model or theory has been successful in predicting actual behaviour change.

It is not uncommon for positive behavioural change to occur without the need for a formal intervention. With this in mind, change following a formal intervention can be viewed as a means of assisting naturally occurring change. However, many factors influence change, a strong determinant being the communication style of the practitioner (Miller and Rollnick, 2002).

1.12.2 Motivation and behaviour change

Motivation is fundamental to all human behaviour and, therefore to the goal of behaviour change, and is at the core of our self-regulation, in that it drives one into action or inaction. People are moved to act by different factors, with varied experiences and outcomes. Causes for action could be a response to internal or external events. When motivation is derived from activities carried out for the inherent satisfaction they provide, referred to as intrinsic motivation, rather than from an external reward (ie. extrinsic motivation), evidence suggests that this fosters confidence which presents itself as enhanced performance, persistence and creativity, (Deci and Ryan, 1991) heightened vitality (Nix, Ryan, Manly and Deci, 1999) and self esteem, (Deci and Ryan, 1995). The characteristics of intrinsically motivated behaviour, as defined by Deci and Ryan (1991), are that it can occur in the absence of external reward, they are undertaken by the individual out of interest, they are optimally challenging, and based on innate psychological needs, namely self-determination and competence.

Research conducted in this area during the 1970's largely demonstrated that extrinsic motivation, defined as motivation that comes from an outside source,

for example, coercion or rewards, thwarts the enhancement of intrinsic motivation or engagement in an activity, as perceived locus of causality is thought to shift from internal to external as a result (Deci and Ryan, 1991). However, interest in the intrinsic versus extrinsic debate continued throughout the 1980's, the findings of which started to demonstrate some evidence that this might not be the case, that extrinsic rewards could in fact result in either an increase or decrease in intrinsic motivation (Deci and Ryan, 1991).

Miller & Rollnick (2002) propose that motivation has three components, namely readiness, willingness and ability. The concept 'willingness' refers to the importance of change, 'ability' refers to confidence to change and 'readiness' to the extent to which making a change is a priority. Thus, an individual may be willing and feel able to embark on a walking programme, but not feel that it is a top priority at a given point in time. Collectively, these three dimensions can give rise to what is known as 'ambivalence', an internal process where a person holds two opposing views about doing something. For example, an individual might understand the importance of being physically active in managing his/her type II diabetes, but might at the same time feel that this would require too much time and effort to achieve. It is uncommon for people to feel 100% certain about changing their behaviour (Miller & Rollnick, 2002), therefore it is said that ambivalence is normal and should be seen as being part of the change process (Engle & Arkowitz, 2006).

Motivation is a '*lively*' concept, which can be viewed on a continuum, in that an individuals' motivation will move back and forth between high and low motivational states, and will be different for different behaviours (Miller & Rollnick, 2002). For example, an individual might be highly motivated to give up smoking but might have a low level of motivation to increase his/her physical activity levels.

Research suggests that individuals are motivated by situations where some choice, control and self-determination exists, and prefer not to be controlled and pressured (Koestner, Lekes, Powers and Chicoine, 2002). However, the presence of motivation may be insufficient on its own to ensure behavioural change, and in some cases may not be necessary at all. For example, legislation that prohibits the use of mobile phones when driving may be more effective than attempting to change the attitudes and beliefs about the risks associated with this activity. However, understanding motivation is of paramount importance to practitioners involved in facilitating behaviour change.

1.12.3 Advice giving - an approach for behaviour change

A very common approach used by many practitioners to facilitate behaviour change is to give advice, with evidence suggesting that this can sometimes be effective (Wallace, Cutler and Haines, 1988). A further approach used often is that of direct persuasion or coercion. The rationale for using such approaches lies in the belief that if an individual is given enough information about the risks associated with an unhealthy behaviour, that this in itself would motivate an individual into action. However, this is often not the case (Rollnick, Kinnnersley and Stott, 1993). A common reaction in response to being told or persuaded into following a course of action is for an individual to become motivated to defend or regain control over the behaviour. Simply speaking, people like to feel in control, and as part of human nature people generally dislike being told what to do and will challenge such perceived threats to their freedom. Reactance Theory (Brehm, 1966; Brehm and Brehm, 1981) deals with how people react to a perceived loss of their freedom. The theory postulates that when an individual feels under threat, the reaction will be to defend his or her freedom and exercise the right to control his or her own behaviour. This theory goes some way to explain why advice giving and persuasion approaches are ineffective in behaviour change.

1.12.4 What prompts people to change?

Miller and Rollnick (2002) propose that positive behaviour change occurs when an individual sees change as highly important and when this is underpinned by intrinsic motivation. Ryan and Deci (2000) support this view, and assert that people will only be motivated to act if such activities stem from the self, and are internalised and integrated into personal goals and values. However, when an individual experiences ambivalence, which can be conceptualised as being 'stuck', ambivalence needs to be worked through to enable the individual to become 'unstuck'. It is unlikely that change will occur until ambivalence is resolved (Engle and Arkowitz, 2006, Miller and Rollnick, 2002).

1.13 Models and Theories in Understanding health behaviour change

Numerous approaches to explaining behaviour change have been proposed in an attempt to understand behaviour change and to provide a theoretical framework upon which health interventions can be based (Deci and Ryan, 1985; Ajzen, 1985; Prochaska and DiClemente, 1982). However, although these models and theories provide us with a useful way of conceptualising behaviour change, deficiencies in their application, coupled with their limited predictive capability have been highlighted in numerous texts (West, 2005; Littell and Girvin, 2002; Conner and Norman, 1996). A brief summary of four theories and models are outlined below.

1.13.1 Theory of Planned Behaviour

The Theory of Reasoned Action (TRA) was developed by social psychologists, (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) to predict and explain volitional behaviour through linking attitudes with behaviour. According to this theory, the best predictor of behaviour is an individual's intention to perform the behaviour, the factors influencing intention being an individual's attitude towards the behaviour and the individual's subjective norm concerning the

behaviour. The TRA's predictive capabilities of behaviours over which individuals have only partial control, for example, physical activity, smoking and weight management, have been questioned (Godin and Kok, 1996), although the model performs better when predicting behaviours under volitional control.

To overcome this limitation, The TRA theory was modified to form the Theory of Planned Behaviour (TPB) to improve the TRA's ability to predict more complex non-volitional behaviour, by adding a further component to the earlier model, namely perceived behavioural control (Ajzen, 1985). This component refers to the degree to which an individual perceives the performance of a behaviour to be under his/her control, drawing similarities with Bandura's concept of self-efficacy (Bandura, 1997; Bandura 1998).

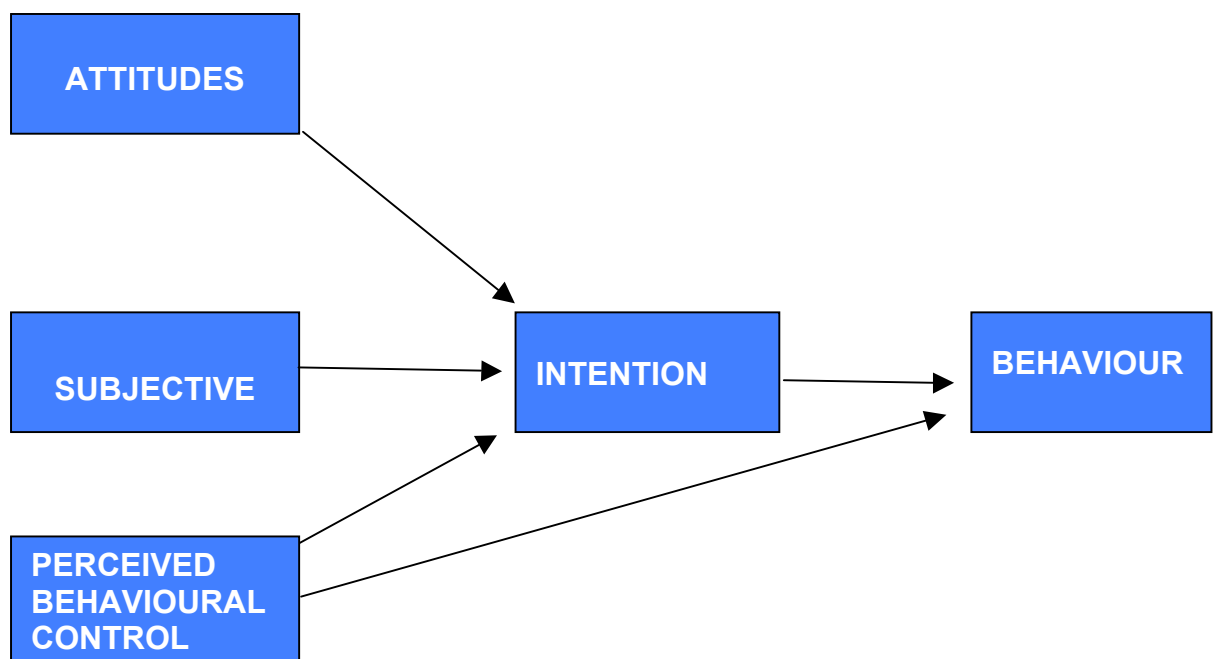


FIGURE 1. The Theory of Planned Behaviour

The TPB proposes that the best predictor of behaviour is an individual's intention (the construct representing motivation) to perform the behaviour (Ajzen, 1985; Conner and Sparks, 1996). In addition, three variables are thought to influence intention, namely:

1. Attitudes towards the behaviour - an individual's positive or negative evaluation of performing the behaviour.
2. Subjective norms associated with the behaviour - an individual's perception of the social pressures exerted on him/her to perform or not perform the behaviour.
3. Perceived behavioural control – the degree to which the individual perceives the behaviour to be under his/her control. This component is said to reflect external factors (e.g. social support and time) and internal factors (e.g. skill, self-efficacy), and it is suggested that it can also directly influence behaviour when the behaviour is not under the complete control of the individual.

The efficacy of the TPB in explaining intention and behaviour has been widely examined to predict a range of health behaviours (Povey, Conner, Sparkes, James and Shepherd, 2000; Norman, Conner and Bell, 2000). The findings are generally supportive of its predictive power for intentions, although evidence suggests that the theory is less effective in predicting actual behaviour change (Godin and Kok, 1996). For example, Armitage and Conner (2001) conducted a meta-analysis of 185 independent studies and concluded that the TPB accounted for 27% and 39% of the variance in behaviour and intention respectively, thus leaving the majority of it unexplained. A further study, testing the ability of the TPB in predicting stage of change for physical activity promotion of mental health professionals drew similar conclusions, in that it explained 27% of the variance in self-reported stage of change for physical activity promotion and 61% of variance in intention to promote physical activity (Faulkner et al, 2001). In other words, strong intentions to engage in healthy behaviours are no guarantee of actual behaviour.

1.13.2 The Health Belief Model

The Health Belief Model (HBM) is an attitudinal model of health decision-making, first formulated by Rosenstock in 1966 to investigate the phenomenon of preventive health behaviour, such as the low uptake of screening programmes. The model makes the assumption that decisions about health behaviour are made rationally. It was developed further by Becker and Mainman (1975) throughout the 1970's and 1980's to predict a range of health-related behaviours, and has generated more research than any other theoretical approach.

The model hypothesises that a decision to change behaviour is determined by an individual's perception of a threat to personal health and of the efficacy of the treatment to reduce the threat. It further proposes that the perception of a threat is determined by two underlying beliefs, namely the perceived susceptibility to the disease and the perceived severity or seriousness of the disease. The perceived efficacy of the treatment is dependant on the individual's assessment of the perceived benefits of the proposed health behaviour and the perceived barriers to performing the suggested behaviour (Becker and Maiman, 1975).

Further dimensions were added to later versions of the model namely health motivation (readiness or motivation to be concerned about health matters), perceived efficacy (the belief in one's ability to successfully enact a desired behaviour to produce desired outcomes) and cues to action (events that motivate people to take action). Others variables were added, including demographics (gender) and psychological characteristics (personality, peer group pressure).

It is suggested that the 'illness-avoidance' focus of the HBM does not lend itself well to explaining and predicting behaviours such as physical activity (Biddle

and Mutrie, 2001) and smoking cessation and diet (Becker and Maiman, 1975). With specific reference to physical activity, this is thought to be largely due to the fact that it is a complex behaviour, in so far as it needs to be continued over the long term as opposed to being a single event. In addition, reasons for being active are varied, ranging from participating for pleasure and as a mode of transport rather than being carried out for health reasons. However, Biddle and Mutrie (2001) propose that as physical activity is now viewed as important for health and is increasingly being 'prescribed' in medical settings, that this may render the HBM useful in some contexts within this area.

1.13.3 The Transtheoretical Model of Behaviour Change

The Transtheoretical Model (TTM), also known as the Stages of Change Model (Prochaska and DiClemente, 1982), has been extensively used in the study and treatment of addictions (Davidson, 1992). Early research on TTM had its roots in psychotherapy and much of the work was carried out in the area of smoking cessation (Di Clemente and Prochaska, 1985).

The TTM proposes that individuals pass through five main stages when attempting to change behaviour. The process is dynamic and individuals may cycle through the stages several times in their efforts to change, and may revert to prior stages, or remain at a stage for some time without movement. These stages reflect the sequential shifts in attitudes, intentions and behaviour (Prochaska and DiClemente, 1982 & 1986).

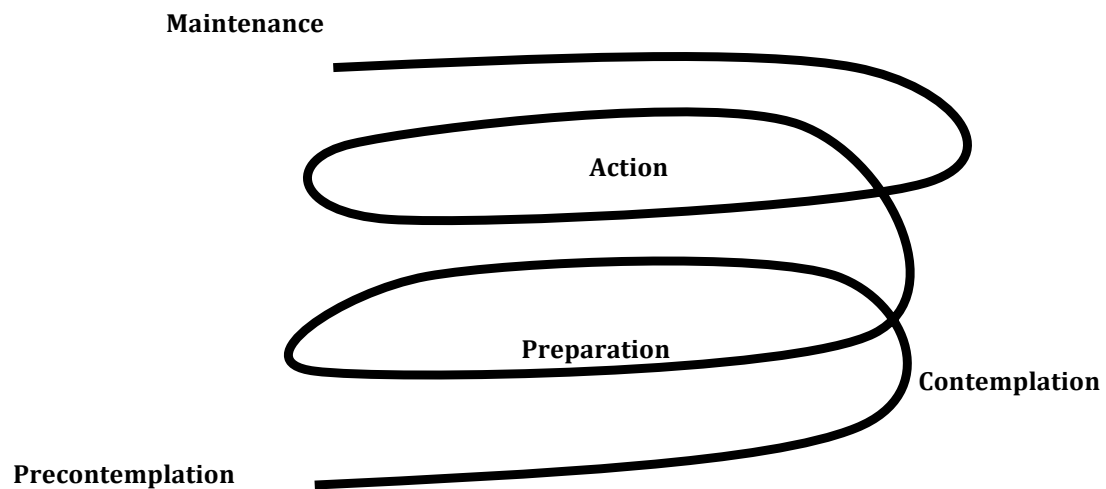


Figure 2. The Transtheoretical Model

The five main stages are:-

1. Pre-contemplation – no intention of making changes in the foreseeable future.
2. Contemplation – considering change
3. Preparation – securing planning and commitment to change
4. Action – actively engaged in the changed behaviour
5. Maintenance – change is sustained over time in an effort to prevent relapse.

A further stage, relapse, has been included in the model in recognition that some individuals will encounter problems when attempting change. This is a useful stage, as it does not imply failure, but highlights the fact that one can move back into the contemplation stage and try again. In addition, the model incorporates a set of ten processes or coping mechanisms that are considered to be necessary for the transition through the stages. These processes describe how changes occur, and are categorised under two broad headings, namely behavioural and experiential processes. Behavioural processes (used in the later stages) are described as being open and trusting to someone about problems and experiential processes (used in the earlier stages) are those to do with commitment to act or believing in ability to do so. The model has gained popularity amongst practitioners, largely due to its intuitive appeal (Herzog,

2005; Littell and Girvin, 2002). In addition, stage-matched interventions, which aim to target interventions at individuals based on their current stage of behaviour change, have also gained widespread interest (Adams et al, 2005; Prochaska and Velicer, 1997).

The TTM has come under criticism in recent years, with particular regard to rejecting the stage-based model on conceptual grounds. Critics argue that the model oversimplifies the complexities of behaviour change into artificial, discrete categories based on arbitrary cut-off points (Davidson, 1992; Davidson, 1998). West (2005) elaborated on some of the flaws of the TTM and argued strongly for it to be discarded on the grounds that it has impeded the advancement of health promotion. Davidson's (1998) critique of the TTM also pointed out numerous problems with the model, but concluded that despite these, the model continued to have heuristic and practical utility in the addictions field, at least.

Recent reviews have suggested that there is little empirical support for the effectiveness of the TTM despite its universal popularity amongst practitioners and researchers (Bridle et al, 2005; Littell and Girvin 2002). Bridle et al (2005) conducted a systematic review to examine the effectiveness of health behaviour interventions based on TTM and concluded that there was limited evidence to suggest that such interventions were more effective in facilitating behaviour change when compared with non-stage based interventions or with no intervention or usual care.

1.13.4 Self-Determination Theory

Self Determination Theory (SDT) is a general theory of human motivation and personality, which explains differences in motivation. Early research focused on social environments that foster intrinsic motivation, with a later focus on the initiation and regulation of externally motivated behaviour. SDT has generated

much knowledge concerning the causes of human behaviour and of the social conditions that facilitate optimal functioning (Ryan & Deci, 2000).

SDT proposes that individuals (regardless of gender, group or culture) have an innate psychological need to act in autonomous, self-determined ways and to engage in tasks that are intrinsically meaningful, as opposed to those that are forced by internal or external forces. Based on the theorising of Deci and Ryan (1985) who examined factors related to intrinsically motivated behaviour, three key innate psychological needs essential for health and well-being were identified:

1. Competence: Perceived competence in the ability to enact the necessary behaviour to yield the desired outcomes.
2. Autonomy: Related to self-determination and refers to feelings of perceived behavioural control and to feel that one is voluntarily engaging in the behaviour, regardless of whether the behaviour is dependant on others or not.
3. Relatedness: Strive for positive interactions with other people and to care for others, the need to experience authentic relatedness from others, and to feel that one is satisfactorily involved and participating in the social world.

However, if the social environment does not allow for the satisfaction of these three needs, the theory suggests that this will result in diminished motivation, impaired psychological development, alienation and possibly poor performance (Deci and Ryan, 1991).

SDT is largely concerned with conditions that elicit and sustain intrinsic motivation. It is made up of four sub-theories, each of which has been developed to explain a set of motivationally based phenomena. The sub-theory, Cognitive Evaluation Theory (CET) is concerned with factors that explain the variance in intrinsic motivation, which it proposes is inherent within human beings. CET deals specifically with social and environmental factors that aid intrinsic

motivation, focusing on the needs for competence and autonomy (Deci and Ryan, 1985).

The importance of extrinsically motivated behaviours and how they can become more self-determined have also been investigated extensively. A further sub-theory of SDT, Organismic Integration Theory (OIT), characterises the different types of extrinsic motivation and the factors that may either promote or hinder internalisation and integration of the regulation of these behaviours (Deci and Ryan, 1985). SDT proposes that extrinsic motivation varies in its relative autonomy, and can be viewed on a spectrum, ranging from amotivation or non self-determined behaviour (no value for an activity) to a more autonomous form of extrinsic motivation known as 'integrated regulation'. This more autonomous form of extrinsic motivation is said to occur when such activities have been fully internalised and integrated to the self and are linked to one's values and needs, and it is through this process that extrinsically motivated behaviour can become authentic (Ryan and Deci, 2000). In addition, this form of motivation is thought to show parallels with intrinsic motivation, the difference being that activities have been carried out for reasons other than for inherent satisfaction (Ryan and Deci, 2000).

The two remaining sub-theories of SDT are Causality Orientations Theory, that describe differences in people's tendencies toward self-determined behaviour and towards adjusting to the environment in ways that support their self-determination, and the Basic Needs Theory, which elaborates the concept of basic needs and its relation to psychological health and well-being (Deci and Ryan, 1985).

SDT offers a theoretical framework for understanding the processes involved in regulating behaviour, and has highlighted the key role that autonomy-supportive practitioners have to play, given that motivation is of key importance in bringing about sustained behavioural change (Ryan and Deci, 2000). In support of SDT within the domain of physical activity study, findings have demonstrated that

better outcomes have been associated with motivation that has been internalised (Chatzisarantis, Biddle and Meek, 1997).

1.13.5 Social Cognitive Theory

Bandura's Social Cognitive Theory (SCT) (1986), derived from the Social Learning Theory, has been applied to many health behaviours. It suggests that an individual's behaviour is determined by the interplay of personal, behavioural and environmental factors and that most behaviour is learned through observing the action of others.

Bandura proposes that all behaviour change is mediated by the cognitive mechanism 'self-efficacy' (Bandura, 1977), a key component of SCT, defined as an individual's belief in their ability to achieve a goal or an outcome. Self-efficacy is thought to be a significant determinant of behaviour. It is thought to develop from four main sources, namely through an individual's own experiences, imitation and modelling, verbal and social persuasion and perceptions of physiological arousal (Bandura, 1977 & 1986). With regards to exercise, self-efficacy is thought to be one of the strongest predictors of adherence.

1.14 Promoting Physical Activity in Primary Care

The health benefits associated with habitual physical activity are undisputed and as a result its profile has been raised leading to this health enhancing behaviour being viewed as an important focus for health promotion within general practice. In particular, in the UK emphasis has been placed on health care professionals to targeting patients with CHD for secondary prevention as well as targeting the general population for primary prevention (DH, 2000a). However, despite the fact that physical activity is getting more of a focus, coupled with strong evidence of the benefits of physical activity, it has been highlighted that physical activity is not being promoted alongside other health behaviours such as healthy eating and smoking cessation (Iliffe and Mitchley, 1994; The European Heart Network,

1999; Wee, McCarthy, Davis and Phillips, 1999), nor is equivalent funding available for interventions to help increase physical activity levels in the population, compared to, for example, the government's substantial investment into smoking cessation services (European Heart Network, 1999; DH, 2001a).

Despite the potential for the promotion of physical activity in the primary care setting, this area is under-researched, particularly in the UK (Hillsdon et al, 1995; Iliffe et al, 1994). More specifically, few studies have explored factors that may determine the behaviour of health care professionals, such as an individual's beliefs and attitudes, and of these studies, the majority have lacked a theoretical perspective (Faulkner and Biddle, 2001; Pender, 1994).

1.14.1 Rationale

Primary care based health practitioners, namely GPs and practice nurses are thought to be in a strong position to influence the physical activity of their patients, either opportunistically through routine visits or through regular check-up clinics (McKenna, Naylor and McDowell, 1998; Pender et al, 1994), although they are generally given little or no training on how to effectively promote behaviour change (Rollnick et al, 1993). The rationale for using health care practitioners to promote physical activity is twofold: health practitioners, have frequent and long-term contact with their patients, with approximately 95% of people visiting their GP at least once in a three-year period (DoH, 2001a), and 70% annually (Biddle and Mutrie, 2001). Secondly, primary health professionals, especially GPs, are often described as being highly credible sources of information, and held in high esteem, and are thus, well-placed to influence change in attitudes and behaviour towards physical activity (Williford et al, 1992; Biddle et al, 2001; Pender et al, 1994).

1.14.2 The evidence

As the primary care setting has been relatively successful in addressing lifestyle behaviours such as smoking (Jamrozik, Vessey, Fowler and Wald, 1984; Lawlor and Hanratty, 2001), strategies targeting physical inactivity have been adopted, albeit with little evidence to support them (Eaton and Menard, 1999; Campbell,

Browne and Waters, 1985; Harland et al, 1999). For example, following recommendations by the US Preventative Services Task Force (USPSTF) in 1996, behavioural counselling by primary care health professionals was widely practised and advocated in the US despite having inconclusive evidence that this approach was effective. As well as issuing a position statement on physical activity in the US, the Public Health Service also set health objectives in 2000 for physicians to increase the level of physical activity promotion by at least 50% (Pender et al, 1994), although surveys of the general public suggest that only a small percentage of physicians follow these guidelines (Wee et al, 1999). However, these recommendations were based on evidence of the benefits of physical activity rather than from actual evidence that these approaches lead to long-term increases in physical activity among adult patients (Eden, Orleans, Murlow, Pender and Teutsch, 2002; Wee et al, 1999). In 2002, these recommendations were updated. The USPSTF (2002) concluded that there was insufficient evidence to determine whether counselling patients in primary care settings to promote physical activity leads to sustained increases in physical activity among adult patients. As presented earlier, in recent years within the UK, based on findings from a systematic review, NICE (2006) deemed primary care based brief interventions an efficacious approach to increasing activity levels in adults.

1.14.3 Advice Giving

A number of strategies have been used within the primary care setting, including referring patients to exercise referral schemes (ERSs) which involve a health professional referring patients to a supervised exercise programme for the management or prevention of a long-term condition (an overview of ERSs is given below). A further approach used in this setting is brief interventions. However, application varies greatly in that a brief intervention may involve giving basic opportunistic advice or more lengthy and structured person-centred approaches (NICE, 2006). As previously mentioned, numerous studies have concluded that advice giving, seemingly the commonest approach used to change behaviours in patients used by health care professionals in primary care, is

largely ineffective (Lawlor and Hanratty, 2001; Rollnick et al, 1993). The rationale for simply giving advice is based on the premise that people do not change because they do not have the relevant information to inform such decisions to change and that once this information is received, and from a credible source, this will result in change. Although this approach may be enough to effect change in some patients, it has its limitations, and in general has been proven not to be effective (Rollnick et al, 1993).

In 2001, a systematic review was carried out in the UK to assess the effect of advice giving in routine consultations within primary care on physical activity levels (Lawlor and Hanratty, 2001). Advice giving was defined as verbal, written or other forms of advice given within a routine consultation within a primary care setting with the specific aim of increasing the activity levels of adult patients. A total of eight studies were included in the review, mostly including studies conducted in the US except for two that were carried out in Australia, with a total of 4,747 participants. Only two studies were randomised. The quality of the included studies was generally poor. As few studies included the same outcomes, a meta-analysis was not conducted and the results were presented in narrative form. The findings revealed that, based on the available evidence, advice giving was ineffective in producing long-term increases in physical activity. However, the authors pointed out that the findings might not be applicable to the UK context due to differences in the primary care structure.

1.14.4 Patient-centred approaches to behaviour change

More patient-centred approaches have yielded better results, with evidence suggesting that patients prefer this approach (Little et al, 2001). Hillsdon et al (2002) conducted a three arm RCT in the UK to examine the effectiveness of advice giving, defined as telling patients about the risks associated with leading sedentary lifestyles and advising them to be active at recommended government levels, versus brief negotiations using the patient-centred approach of Motivational Interviewing, an evidence-based style of counselling (Miller &

Rollnick, 2002). One thousand, six hundred and fifty-eight male and female patients were randomised to 30 minutes of direct advice or brief negotiations or to a control group, which received no intervention. The primary outcome measure was self-reported physical activity at 12 months. The authors concluded that brief negotiations in primary care for patients whose health might benefit from increasing their levels of physical activity were more effective than giving direct advice, or using coercive or persuasive methods.

An RCT conducted in the US comparing the effect of two styles of physical activity counselling with standard care over two years yielded similar results in women only (The Writing Group for the Activity Counseling Trial Research Group, 2001). The study was underpinned by the SCT in identifying personal, social and environmental factors as physical activity participation mediators which were then targeted using strategies such as goal setting, problem solving and supportive feedback. A total of 874 inactive patients, free from any serious long-term condition (395 females and 479 males) aged between 35 to 75 years were randomly assigned into one of three groups. The advice group (standard care) involved brief GP advice lasting 2-4 minutes. This involved the GP assessing the physical activity status of patients using a self-assessment tool, giving advice to increase activity levels and on setting a long-term goal and referral onto an on-site health educator in order to receive more information or counselling. Onward referrals to the health educator involved giving patients health promotion materials on physical activity and answering questions related to recommendations given by GPs. Patients were able to call the health educators with any questions they had. At the follow-up appointments the GPs provided advice for the patient who also briefly met with the health educator where they were given limited information on physical activity but did not receive counselling.

The assistance group received the same intervention as the advice group, which was delivered by the GP, in addition to 30-40 minutes of behavioural counselling which involved the patient viewing a motivational recording, a discussion

regarding the benefits of being physically active specific to the patient and the development of an individualised physical activity plan. The health educator provided telephone support and advice one week after the first visit. An interactive component formed part of the intervention, which involved patients being sent monthly newsletters with the aim of increasing cognitive and behavioural skills related to physical activity. The newsletter included a postage paid postcard for reporting weekly physical activity, goals and barriers to participation. Patients were also given pedometers (a motion sensor device that measures the total number of steps walked) and a log-book to record daily steps taken and time spent being physically active, the information of which was sent back to the health educator using the postcard on a monthly basis. Health educators provided patients with further information in response to the information submitted to them on the postcards. The health educator contacted those patients who sent back less than 70% of the postcards within a 6-month period to encourage them to use the interactive mail component of the intervention. In addition, low-cost non-monetary incentives were given to patients for returning the postcards. Patients received brief behavioural counselling delivered by the health educators at GP visits.

The counselling group received the same intervention as the assistance group in addition to regular telephone counselling and weekly behavioural classes lasting approximately one hour and delivered by the health educators.

The current physical activity recommendations were consistently promoted across all three groups. The primary outcome was cardiorespiratory fitness measured as maximum oxygen uptake by a treadmill test and self-reported physical activity measured by a seven-day physical activity recall questionnaire measured at two years. The results were analysed separately for men and women. At two years amongst women, the counselling and assistance intervention groups which equally effective in improving cardiorespiratory fitness compared to the advice group. The assistance intervention group had approximately three hours of total contact time over the two years, which was divided over approximately twenty-two contacts. The counselling intervention

group received more frequent and longer contacts over the two years than the assistance group, but this did not result in more significant results. Amongst men, the two intervention groups were no more effective than standard care.

More research has been conducted in recent years to examine the effectiveness of brief interventions to increase physical activity levels. A number of studies have been successful in providing evidence in support of the use of these approaches in primary care based settings. For example, a UK study was conducted to examine the effects of using a patient-centred counselling approach on CHD risk factors, through making changes to physical activity patterns and diet (Hardcastle, Taylor, Bailey and Castle, 2008). The study used a two-group RCT design. Following a baseline assessment, three hundred and thirty four patients were randomised into either an intervention (n=203) or control (n=131) arm of the study. The intervention group received up to five one-to-one consultations lasting between 20-30 minutes to address lifestyle issues with either a physical activity specialist or a registered dietitian who had received training in both nutrition and physical activity. Patients were given the choice to either attend some or all of the consultations based on whether the patients felt they would be useful. The approach used within the consultations was an adapted form of Motivational Interviewing. The control group received standard care in the form of a health promotion leaflet giving information on physical activity and nutrition. Patients in the intervention group were also given the same leaflet. All patients were followed up after 6 months.

The findings revealed that patient-centred counselling resulted in an increase in activity levels, the preferred mode of physical activity being walking. However, decreases in physical activity were evident amongst control group participants. In addition, the more consultations attended by patients, the greater the reductions in body weight, blood pressure and cholesterol were noted.

1.14.5 Barriers to physical activity promotion

In comparison to, for example, smoking, physical activity is a relatively new sphere for primary health care practitioners and unfortunately, a number of barriers to its promotion have been identified. Pender et al (1994), identified several barriers such as time constraints, lack of reimbursement, lack of standard protocols, perceived effectiveness as counsellors, and lack of appropriate training. In addition, McKenna et al (1998) examined barriers to promoting physical activity by GPs and practice nurses (PNs) and identified several attitudinal and systematic barriers towards its promotion. Attitudinal barriers concerned beliefs about the efficacy and status of physical activity promotion whereas system barriers include time constraints, lack of incentive or reimbursement, perceived success as counsellors, lack of appropriate training and the lack of standard protocols. Lack of time was the most frequently reported barrier, similar to the findings of other studies (Bull, 1995; Pender et al, 1994).

It is important that these barriers are explored given that health care professionals are major influencers of behaviour change in patient populations. Based on study findings, it is also necessary to assess knowledge base and skills to determine whether or not primary health care professionals are in fact equipped to help patients to change behaviour. An insight into these areas will help to identify knowledge gaps and the barriers faced when promoting physical activity in the primary care setting, and will assist them in promoting physical activity more effectively.

Several studies have found that the knowledge of health care professionals is limited in the area of physical activity (Williford, Barefield, Ramona and Olson, 1992). Gould, Thorogood, Iliffe and Morris (1995) carried out a qualitative study to examine the knowledge of primary health care professionals regarding the health benefits of physical activity, and their attitudes towards it. Exploring attitudes is important as they may influence advice given to patients. Twenty semi-structured interviews were conducted with GP trainers (GPs trained in educational methods and re-accredited on a regular basis) and their practice

nurses (PNs). The interview schedule was based on questions exploring knowledge and attitudes regarding physical activity, clinical practice in this area, and personal physical activity behaviour. The study revealed that the majority of PNs and all the GPs had received no training in the area of physical activity promotion. In addition, although physical activity was viewed positively amongst the GPs and PNs, knowledge of its health benefits was low. For example, cardiovascular improvements were mentioned by only half of the participants as a benefit of regular physical activity. This study suggests that there is a need for physical activity promotion training in this setting, to assist health professionals in becoming more effective in this area. Limitations of this study include the fact that the GPs interviewed were not typical of regular GPs, in that they were GP trainers, considered to be amongst the most up-to-date in their knowledge, suggesting that knowledge amongst regular GPs may be even lower than that observed in the present study.

A further study conducted in the US used a questionnaire design to examine the attitudes and practices of one hundred and sixty-eight randomly selected physicians related to physical activity promotion (Williford et al, 1992). The study revealed that although 91% of GPs promoted physical activity, less than a quarter were familiar with the current guidelines for physical activity, supporting the findings of other research conducted in this area (Gould et al, 1995). The study also found that only 3% had undertaken training in the area of physical activity at college level, however, 78% of participants identified a need to address training issues in this area. Regarding clinical practice, 49% took an exercise history from their patients as part of their initial assessment, and the vast majority of GPs (70%) did not develop exercise prescriptions for their patients. Only 13% of GPs had members of staff whom they could refer their patients to for an exercise prescription. For those GPs unable to offer this service, patients requiring such prescriptions were most often referred to physical therapists (68%), and less frequently to other physicians (20%), exercise physiologists (9%) and nurses (3%). This study is limited in two ways: firstly, it relies on self-report and secondly, the sample size was relatively small.

A similar study, using a questionnaire design, was carried out in Australia by Bull, Schipper, Jamrozik and Blanksby (1995), to assess clinical practice, perceived desirable practice, and barriers to physical activity promotion amongst GPs in Perth. Of the 1288 GPs who were sent a questionnaire, 789 responded. The authors concluded that GPs were in strong support of promoting physical activity in primary care. The results from the survey suggest that GPs were largely in agreement that the benefits of physical activity should be discussed, patient's activity levels recorded and specific physical activity programmes discussed on a more frequent basis than is currently practised. Interestingly, only 20% of GPs identified lack of training to be a barrier to physical activity promotion in this study whereas the vast majority of GPs in a US study (Williford, et al, 1992) perceived there to be a need for such training. The major barrier identified was time, with lack of resources, and patient preference for drug treatment also cited.

Wee et al (1999) conducted a study to examine physical activity counselling rates, and to identify factors related to counselling amongst physicians using data from a national health interview survey of the general population in the US. In contrast to other findings relying on self-report on the clinical practice of health care professionals (Williford et al, 1992), from a sample of 9299 respondents to the household survey, findings revealed low levels of exercise counselling rate amongst GPs (34%). However, McKenna et al (1998) found that 69% of GPs and PNs reported regularly promoting physical activity with their patients and that they were more likely to promote it if they themselves were regularly active. In addition, Williford et al (1992) found that GPs were more likely to promote it with patients as a form of secondary prevention, suggesting that it is possibly under-utilised as a form of primary prevention (Pender et al, 1994). This study was strengthened by the fact that it used a large and nationally representative sample of the general population, rather than relying on the self-report of health care professionals who may respond to questions in socially desirable ways, as opposed to reporting their actual promoting behaviour.

The majority of studies in this area have relied on self-reports from health care professionals, have failed to use valid measures to assess counselling behaviour, and have failed to operationally define terms, such as 'promotion' or 'counselling' (Pender et al, 1994). Furthermore, many studies can be criticised for being methodologically weak in that they have used small numbers of participants (Williford et al, 1992), and generally lack control trials (Pender et al, 1994). Nevertheless, these existing studies should be valued in their own right, as they have made valuable contributions towards knowledge in this area.

1.15 Exercise Referral Schemes (ERS)

ERSs, also referred to as 'GP Exercise Referral' or 'Exercise on prescription' are becoming increasingly popular within general practice in the UK and in other countries, to promote long-term participation in physical activity for inactive patients with long-term health conditions (Taylor, et al, 1998; Jones, Harris, Waller and Coggins, 2005; Sorensen, Skovgaard and Puggard, 2006; Dugdill, Graham and McNair, 2005; Lord and Green, 1995). In 2003, it was estimated that over 800 ERS were in operation across the UK (Wright Foundation Conference 2003), compared to estimates carried out in 1996 that identified approximately 200 schemes (HDA, 1998). ERSs have been developed in response to 'The Health of the Nation Strategy' to reduce CHD levels (DH, 1992) and have been endorsed by the Government as one type of intervention to support the delivery of local action plans to increase physical activity levels, reduce obesity and to help tackle long-term conditions (DH, 2001c).

ERSs offer support for inactive patients in adopting and maintaining long-term participation in physical activity. A variety of models are used, and schemes are largely run in partnership with primary care and local authorities (Dugdill et al, 2005; Jones et al, 2005; DH, 2001c). They typically involve a health professional (general practitioner or a practice nurse) in a primary care based setting referring a patient to a supervised exercise programme at a leisure centre or gym. In many schemes, participants are offered a subsidised rate (Dugdill et al,

2005) or the cost of a prescription (Lord et al, 1995; Jones et al, 2005) for a fixed period of time.

Exercise programmes are led by appropriately qualified exercise practitioners, for a defined period of time, approximately 8-12 weeks. ERSs provide an assessment, a tailored physical activity programme based on the needs of the patient, monitoring of progress and follow-up of the patient's progress (NICE, 2006). Schemes offer a broad range of activities, such as gym sessions, water-based sessions and group based studio exercise classes, which are often run from local leisure centres (Jones et al, 2005). However, many schemes now also offer non-facility based activities such as group walks and as such, it has been suggested that the naming of schemes should reflect these changes, for example, in renaming them 'physical activity referral schemes' (Dugdill et al, 2005).

Each scheme develops criteria for patient selection. Criteria often include patients who are currently inactive with modifiable risk factors for CHD, including hypertension, obesity and type II diabetes, with some schemes accepting patients with established CHD (Riddoch and Puig-Ribera, 1998). In addition, a process for the screening and referring of patients is set up. Prior to participation on an ERS, participants are assessed for their suitability to participate in a programme of activity, using health information supplied from the referring health professional in addition to other procedures (Dugdill et al, 2005). The document Exercise Referral Systems: a National Quality Assurance Framework (DH, 2001c) was developed to provide guidelines to improve the standards and quality of existing schemes and to inform the development of new ones.

It is reported that adherence to ERSs is notably poor, with over 50% of participants dropping out of programmes by week ten (Taylor, 1996). Factors associated with drop out of ERSs included low activity levels on entry to the

programme (Lord and Green, 1995; Taylor, 1996), being of a younger age (Lord et al, 1995) and participants having childcare responsibilities (Jones et al 2005). However, little research has been conducted in this area to support these findings, which should therefore be interpreted with caution. There is also a need to investigate possible psychological factors that might be associated with the dropout phenomenon, which have to-date been largely ignored (Dugdill et al, 2005; Jones et al, 2005).

Despite the popularity of ERSs, their effectiveness has been widely questioned due to a lack of research in this area (MacAuley, 2000; Riddoch et al, 1998). For example, Iliffe et al (1994) identified only twelve RCTs of ERSs, none of which had been conducted in Britain. Of the limited evidence available, much of it has come from the US, and there are concerns that the findings may not be applicable to the UK context (Dugdill et al, 2005). Of great concern is the fact that many schemes in the UK are rarely evaluated (Iliffe et al, 1994; NICE, 2006; Dugdill et al, 2005), or that evaluations are of poor quality, often including the recording of throughput, physiological data and little else (Wright Foundation Conference, 2003; Dugdill et al, 2005). Reasons cited for this include a lack of funding, time and not having personnel with the appropriate skills to undertake high quality evaluations (Riddoch et al, 1998; Dugdill et al, 2005).

ERSs have been criticised in recent years, for example, for ‘medicalising’ physical activity (MacAuley and Jaques, 2000). In addition, Iliffe et al (1994) questioned their worth, in highlighting the danger of investing in such schemes without the evidence-base to underpin them, a view supported by Dugdill et al (2005), who asserted that we must ere on the side of caution in viewing ERS as the solution for promoting physical activity in the UK. Dugdill et al (2005) go on to suggest that their rapid growth has largely been due to Government endorsement rather than being based on evidence that such schemes are efficacious. To end, Iliffe et al (1994) state that ERSs that have not been evaluated ‘may be of no more value than prescribing coloured water’ (pg. 495).

However, as highlighted within the Foresight Report (2007), interventions aimed at increasing activity levels are of great importance, and a lack of evidence should not lead to inaction. Innovative interventions in the absence of conclusive evidence may be warranted until such time that the evidence base is established. However, interventions should be informed by existing evidence and best practice (Foresight, 2007, pg. 62). In addition, the Department of Health (2007) endorse the use of ERSs which focus on treating long-term conditions and for preventing or improving certain conditions.

1.16 Motivational Interviewing (MI)

As previously discussed, helping people to adopt healthier behaviours and avoid unhealthy ones is a major challenge faced by many health care professionals and other practitioners alike. The evidence demonstrates that client-centred approaches to facilitate behaviour change are more effective (Hardcastle et al, 2008; Hillsdon et al, 2002) and that patients prefer a client-centred approach to consultations (Little et al, 2001).

1.16.1 Origins of MI

Motivational Interviewing (MI) is a client-centred and evidence-based style of counselling which has been defined as a “client-centred, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence” (Miller and Rollnick, 2002, pg. 25). According to the founders of MI, an ambivalent individual is said to be ‘resistant’, observed through patterns of behaviour, for example, arguing to stay the same, and can also occur as a direct response to the way a practitioner speaks to an individual (Miller and Rollnick, 1991). MI interventions vary in their duration from a few minutes to in excess of four or more sessions.

MI is a relatively new therapy that has been used extensively in the addiction treatment field and in more recent years has been used to address a range of

behaviours and long term conditions including medication compliance, HIV risk reduction, increasing physical activity, weight loss, smoking cessation, diabetes, CHD and mental health problems (Rollnick, Miller and Butler, 2008). Over the past 26 years, interest in MI has grown immensely. The term 'interviewing' refers to the notion of interview structures being equal, in that no party has more power than the other. Miller and Rollnick (2002) liken this to 'looking at something together' to gain an 'inter-view' (pg. 25).

MI was not founded on a specific theory but evolved from the client-centred counselling approach developed by Carl Rogers (1951). Engle and Arkowitz describe MI as a "client-centred therapy with a twist" (2006, pg. 173), the 'twist' being that it differs from the client-centred approach in that MI it is intentionally goal-directed in its aim to increase intrinsic motivation by resolving ambivalence to move people towards change. Thus, MI fits into some existing theoretical frameworks, including Self-Perception Theory (Bem, 1967), TTM (Prochaska & DiClemente, 1982), Self-Efficacy Theory (Bandura, 1977) and Cognitive Dissonance Theory (Festinger, 1957).

William Miller, a clinical psychologist, is thought to have discovered MI by chance during the 1970's when examining an intervention for treating problem drinkers. Miller found that outcomes for participants in both the control and intervention groups were similar, and upon further delving found what appeared to explain this finding. Improvements seen in participants in the control group appeared to occur due to the communication style used by the practitioners in that they were non-confrontational and empathetic and did not give unsolicited information to clients. Miller (1983) first described MI in an article on his experience of treating problem drinkers, entitled "Motivational Interviewing with Problem Drinkers" as outlined briefly above. As interest in MI grew, following Miller's article, out of interest in its potential to address issues of substance misuse, Miller collaborated with Rollnick to investigate the processes and outcomes of MI (Miller & Rollnick, 1991). This led to MI being closely linked to the TTM (Prochaska & DiClemente, 1982) that was developed at the same time as MI but separately, in that individuals undergoing change do so in stages

and in light of the fact that MI can be used at any stage of the change process, thus providing a framework for understanding the process of change.

1.16.2 MI - The 'Spirit'

MI has recently been conceptualised as a 'refined form of guiding', ("I can help you to work this out for yourself"), which sits between 'directive' approaches which tend to be used predominantly during consultations about behaviour change (Rollnick et al, 2008), ("I know how you can increase your activity levels. You should try this....."), and 'following' approaches ("Take your time, there is no rush"). However, it should be remembered that MI is directive in that the goal is to change behaviour, so not all aspects of MI use a guiding style.

The overall essence of MI is captured in Miller and Rollnick's (2002) use of the term the 'Spirit' of MI, which refers to the manner in which practitioners engage in conversations with their clients. In helping to understand this concept, it is thought to be made up of three components, namely collaboration, evocation and honouring client autonomy (Rollnick et al, 2008). Collaboration refers to the practitioner working in partnership with the client on an equal basis, which may involve joint decision-making. Evocation relates to the practitioner finding the client's intrinsic motivation for behavioural change and eliciting it, in the form of 'change talk' (client's speech that favours change which helps individuals to get access to and to verbalise their intentions). Honouring client autonomy refers to the practitioner respecting that it is the client's choice whether to change or not change, and that acknowledging this may in fact make change possible.

The four key guiding principles described by Miller and Rollnick (2002) include conveying understanding of the client's viewpoint through reflection, developing discrepancy between where they are now in terms of their present behaviour and where they want to be based on their personal values and goals, reducing resistance by reframing a problem or question, thus involving them in problem solving and decision making and in supporting self-efficacy through building confidence that change is possible.

Several methods are used in MI for the purpose of exploring and helping to resolve ambivalence, as well as to help clarify the client's reasons for change, the goal being to elicit change talk. Of these, the use of reflections and open-ended questions are of great importance. They include:-

1. Open-ended questions – questions framed in such a way that it encourages an individual to fully express their opinion rather than giving merely 'yes' or 'no' answers.
2. Affirmations – statements of appreciation or compliments
3. Reflections – statements of understanding.
4. Summarising – a periodic summary of a conversation.

Five types of change talk have been identified, namely desire, ability, reason, need and commitment talk. Rollnick and Miller (2002) propose that it is the strength of expressions of desire, ability, reason and need to change made by the individual collectively that will influence the strength of an individual's commitment to change their behaviour ("I intend to....."). Further, it is the strength of that commitment that will predict actual behavioural change. Expressions of desire, ability, reason and need are viewed to be forms of pre-commitment change talk. A further type of change talk is utterances made by individuals about steps they have taken towards change ("I have bought a pair of trainers to wear when I start my walking programme") (Rollnick et al, 2008).

Other strategies are used in MI for building confidence and resolving ambivalence which include using confidence and importance rulers to explore readiness/motivation to change, decisional balance in weighing up the pros and cons of change and a 'typical day' strategy which allows the individual to tell their story and is useful for establishing rapport.

1.16.3 The evidence for MI

Numerous systematic reviews have been conducted across a range of health domains to examine the efficacy of Motivational Interviewing (Ruback, Snadbaek, Lauritzen and Christensen, 2005; Hettema, Steele and Miller, 2005; Knight, McGowan, Dickens and Bundy, 2006; Burke, Arkowitz and Menchola, 2003, Dunn, Deroo and Rivara, 2001). A systematic review of motivational interviewing in physical health care settings found MI to be effective in relation to physiological, psychological and lifestyle change outcomes within the domains of diabetes, asthma, hypertension, hyperlipidemia and CHD (Knight et al, 2006). However, due to the poor quality of the included studies, coupled with low content validity, a meta-analysis was not performed. Eight studies were included in the review, half of which were RCTs. The authors identified several gaps in the MI research literature and highlighted the need to gain further insight into the extent of MI training received by practitioners, MI skills needed and the optimal duration of sessions required. In addition, they highlighted difficulties in determining whether the methods used by practitioners were in fact delivered within the 'spirit' of MI, due to a lack of description of the methods employed.

Dunn et al (2001) conducted a systematic review to examine the effectiveness of brief interventions using an adapted form of MI in addressing substance abuse, smoking, HIV risk reduction and diet/exercise to address their concerns that the popularity of the approach may have outstripped the evidence for its effectiveness. Twenty-nine studies were included in the review: seventeen in substance abuse, two in smoking, four in HIV risk reduction and six in diet/exercise. The effect size for three of the diet/exercise studies ranged from 0.36 to 2.17. In one study, exercise was increased for up to three months following an MI intervention and was more effective if the approach was delivered in six sessions as opposed to in just one. Two further exercise studies, with small sample sizes, of obese women and patients with CHD produced positive but non-significant effect sizes. The authors concluded that the review revealed little about how MI might work. However, considerable evidence for

the effectiveness of MI as a brief intervention for substance abuse was found, especially when used as a motivational lead up to more intensive treatment. For the other behaviours, although the evidence showed promise, it was insufficient to warrant dissemination as an approach to behavioural change. Lastly, the authors cautiously suggested that brief MI interventions might deserve consideration as an intervention for increasing exercise.

Rubak et al (2005) conducted a systematic review and meta-analysis comparing the effectiveness of motivational interviewing using traditional advice giving in facilitating behavioural change as the control condition. Seventy-two RCTs were included in the review across the domains of alcohol abuse, psychiatric diagnoses, addiction, weight loss, hyperlipidemia, exercise, diabetes, asthma and smoking cessation. 75% of the RCTs demonstrated an MI effect, with effect sizes increasing with the number of sessions attended. Even brief sessions lasting less than twenty minutes revealed an effect in 64% of the studies examined, with 81% of studies with sessions lasting sixty minutes demonstrating an effect. In addition, the authors found that physicians obtained an effect in 83% of the studies, psychologists 79% and other providers such as midwives, nurses and dieticians in 46% of the studies. It was concluded that MI outperforms traditional advice giving in treating a wide range of long-term conditions and behavioural problems.

1.16.4 Implications for future research

Systematic reviews have revealed a number of implications for future research in this area including the need for more thorough high quality studies to be conducted in fields other than addictions (Knight et al, 2006). There is also the need for studies with larger sample sizes (Knight et al, 2006; Rubak, 2005), power calculations and in-depth descriptions of how interventions have been conducted (Knight et al, 2006). It has also been identified that information on the level of MI training received by practitioners is needed (Dunn et al, 2001; Knight et al, 2006), in addition to descriptions of the content of sessions

delivered (Knight et al, 2006) and information on the MI skills of the practitioner delivering the intervention (Knight et al, 2006; Dunn et al, 2001). The importance of the need to apply a standardised coding system to evaluate the MI 'spirit' and techniques used by practitioners has been highlighted which will enable practitioner MI skill level against outcome to be evaluated (Knight et al, 2006). There has also been a call for the use of qualitative research methodology to examine how MI can be successfully assimilated into practitioners' everyday work (Rubak et al, 2005).

1.16.5 SDT – A theoretical framework for MI?

As previously mentioned, MI was not based on a specific theory and to-date it has not been determined how and why it is effective. Similarities have been identified between the applied approach of MI and the more theoretical approach of SDT (Markland, Ryan and Rollnick, 2005; Vansteenkiste and Sheldon, 2006). In recent years it has been proposed that SDT may provide a theoretical framework for understanding the processes underlying behaviour change in motivational interviewing (Markland et al, 2005). In addition, Vansteenkiste and Sheldon (2006) suggest that MI principles provide SDT researchers with practical tools to examine the application of the SDT's concept, autonomy-support in further investigating and developing SDT theory. They also suggest a 'marriage' of the two approaches, as they are complementary of each other in providing insight into self-motivated behavioural change and its promotion.

1.17 Implementation Intentions

“The road to hell is paved with good intentions”

Good intentions have received bad press. The above quote can be interpreted as meaning that good intentions are of no value unless they are put into action. If we take the case of the many people who set well intended New Year's resolutions, for example, to quit smoking, to lose weight, or to be more physically active, they are often met with pessimism from others as to whether they will in

fact be achieved. However, based on the findings of research carried out within the framework of the TPB as outlined above, intentions should not be 'thrown out with the bathwater' as there is evidence that strong intentions translate into action, albeit the correlation being only modest (Godin and Kok, 1996; Armitage et al, 2001).

A body of research within the domain of health-related behaviour change suggests that augmenting a behavioural intention with an implementation intention (a plan that outlines the when, where, and how a behavioural intention will be carried out) might be a useful strategy in helping people to enact their health goals (Armitage, 2007; Orbell, Hodgkin and Sheeran, 1997; Gollwitzer & Brandstatter 1997). For example, a person who sets a goal intention of being more physically active ('I intend to do more exercise') might supplement it with an implementation intention ('I will go for a 30 minute walk after breakfast at 9am on Mondays and Wednesdays in Roundwood Park'). Thus, the goal intention is the expected outcome of enacting the behaviour, which once formed commits the person to act. That said, implementation intentions ignore the potential barriers to their implementation. Secondary to goal intentions are implementation intentions, which serve the purpose of helping the individual to translate a goal intention into action. The way in which implementation intentions assist is by helping the individual to overcome the difficulty of initiation, by identifying the context and time that the behaviour will be enacted. This is thought to arise from mentally linking behavioural intentions to situational cues in advance so that they eventually become automatic and easily accessible, thus rendering the need for conscious and effortful control (Gollwitzer, 1999).

Numerous studies have demonstrated that forming implementation intentions facilitates the enactment of behavioural intentions. Such findings were reported in studies examining the role of implementation intentions in the areas of breast self-examination (BSE) (Orbell et al, 1997), cervical screening uptake (Sheeran

and Orbell, 2000), increasing fruit consumption (Armitage, 2007) and vitamin supplement use (Sheeran and Orbell, 1999). In the breast self-examination study, 64% of women in the intervention group compared to 14% in the control group performed BSE ($p < 0.01$). The cervical screening uptake study found that 92% of women attended their cervical screening appointment compared to 69% of the control group ($p < 0.01$). The study testing the effectiveness of implementation intentions to increase fruit consumption revealed significant increases in the intervention group compared to the control group ($P < 0.05$). Prior to the intervention participants were consuming less than one piece of fruit per day, which increased to the majority consuming just over one portion per day over the two-week study period. The findings of the vitamin supplement study lend further support to the efficacy of implementation intentions in that, based on self-report and pill count measures, the intervention group had missed significantly less pills than the control group ($p < 0.05$).

Based on the above, there is strong evidence that by using the self-regulatory strategy of supplementing goal intentions with implementation intentions, the likelihood of goals being achieved is substantially increased. In relation to physical activity, given the simple nature of forming implementation intentions, coupled with its effectiveness, it seems feasible to use this approach to help facilitate behaviour change through assisting people in taking action.

1.18 Purpose of the Study

The present study aimed to determine the effectiveness of a primary-care physical activity referral scheme using Motivational Interviewing and Implementation Intentions to promote the long-term maintenance of physical activity compared to the effects of a physical activity referral scheme on its own among patients at high risk of CVD or with established CVD. Participants were randomised into groups receiving one of three treatments. One group received

face-to-face Motivational Interviewing counseling. The other group formed implementation intentions to assist in translating goal intentions into action. The third group received standard care (physical activity referral scheme only) and acted as the control group.

1.19 Study Rationale

Increasing physical activity levels is important in improving the health of sedentary populations, particularly those with long-term health conditions who are amongst the most inactive. The formation of implementation intentions and the use of Motivational Interviewing have been used with relative success to facilitate behavioural change across a range of health behaviours, although their application to increase the adoption and maintenance of a physically active lifestyle have not been reported extensively. There is theoretical and empirical evidence suggesting that both Motivational Interviewing-based interventions and the use of implementation intentions may improve long-term participation.

1.20 Study Hypotheses

The main study hypothesis was that a physical activity referral scheme using Motivational Interviewing or implementation intentions would significantly improve long-term participation in physical activity more than a physical activity referral scheme on its own at three and six months as measured by 7-day Physical Activity Recall and participant progress through the stages of change of the Transtheoretical Model.

2. METHOD

2.1 *Aim of the study*

The primary aim of the study was to determine the effectiveness of a primary care physical activity referral scheme on increasing physical activity levels in inactive patients to partaking in thirty minutes of at least moderate intensity physical activity on three days of the week at three and six months from referral. Two behaviour change approaches were used, namely Motivational Interviewing or Implementation Intentions, compared with a treatment as usual control group.

The secondary aims of the study were to determine the role of motivation, measured using the dimensions importance and confidence, in predicting outcomes and to understand the participant's perspective of the usefulness of the physical activity referral scheme in assisting the increase in activity levels.

2.2 *Research Question*

In comparison with a control group (physical activity referral scheme), does the addition of Implementation Intentions (Intervention Group 1) or Motivational Interviewing (Intervention Group 2):-

- Alter stage of change for physical activity?
- Improve physical activity patterns?
- Increase participants' perception of their confidence to increase/maintain physical activity levels?

- Increase participants' perception of the importance of increasing/maintaining physical activity levels?

A further research question examined the participant's perspective of the usefulness of the physical activity referral scheme in assisting to increase activity levels.

The original research question was designed as a four-group randomised controlled trial to address the questions above. The four groups were a control group (physical activity referral scheme), the addition of Implementation Intentions (Intervention Group 1), Motivational Interviewing (Intervention Group 2), or Implementation Intentions and Motivational Interviewing combined (Intervention Group 3). However, due to the problems encountered over the study period (described in the discussion section), this resulted in the third intervention group being removed in an attempt to achieve an adequate sample size across the remaining three groups.

2.3. Design

A three-group randomised controlled trial examined the effectiveness of a primary care physical activity referral scheme using a Motivational Interviewing approach and a physical activity referral scheme using Implementation Intentions to increase physical activity levels at three and six months, compared with a physical activity referral scheme only (control).

2.4 Scheme Background

The physical activity referral scheme was funded through the Neighbourhood Renewal Fund (NRF), which is a time-limited central Government funding programme available to 88 local authorities in England with the 10% most deprived wards. Five of Haringey's super output areas are amongst the top 3% of the most deprived wards in England. NRF assist the main public sector

providers and other key agencies in thinking about how services could better meet the needs of people in deprived neighbourhoods, in collaboration with their Local Strategic Partnerships (LSP) who are responsible for making decisions on how the NRF is spent, and for approving such programmes. Under the well-being block of the Haringey LSP, the Board identified three areas of priority for funding, namely 'be healthy', 'achieve economic well-being' and 'meeting current and future housing need', with physical activity falling under 'Be healthy'. Following the submission of an application in May 2006 by the author to establish a physical activity referral scheme in Haringey, funding was approved.

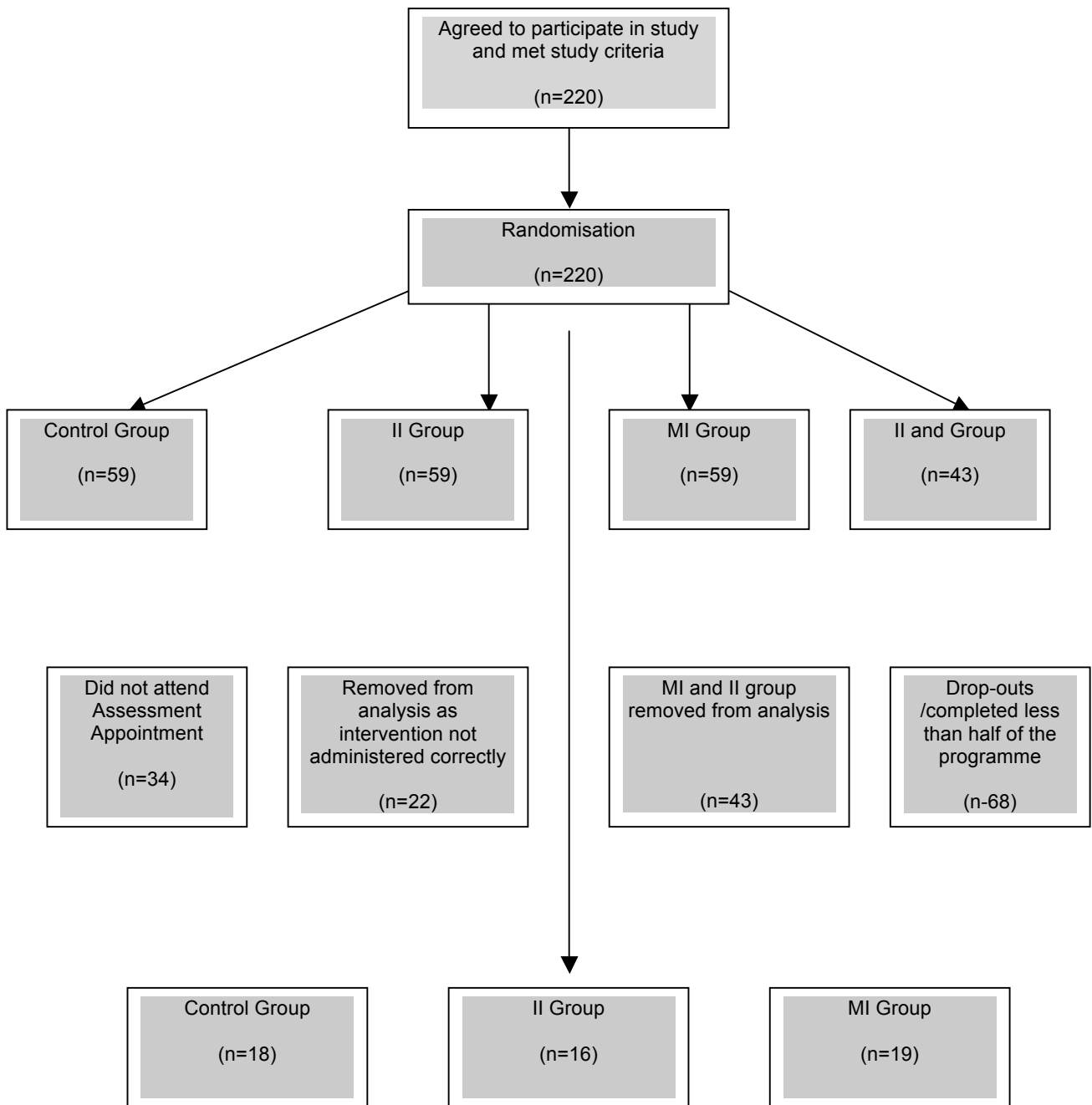
2.5 Participants and recruitment

Ethical approval was obtained for the study from the Barnet, Enfield and Haringey Local Research Ethics Committee on 3rd May 2007. Between July 2007 and January 2009, 220 adults between the ages of 19 and 85 consented to take part in the study from fourteen general practices initially, increasing to twenty-nine practices by January 2009. Thirty-four of the participants (15%) who consented and who were randomised did not attend their assessment appointment. Sixty-eight participants (31%) who started the programme dropped out. Dropout was defined as completing less than half of the prescribed physical activity; three sessions of at least moderate intensity physical activity lasting at least 30 minutes, two of which required attendance at the exercise venue. The main reason given for dropping out was due to illness.

In addition, the data of 22 participants (10%) could not be used due to the intervention being incorrectly administered, for example, in many cases allowing participants to take part in the programme for longer than a 12-week period and scheme personnel using incorrect paperwork or only partially collecting the required data. Many of these problems arose due to severe staff shortages. This resulted in having a major negative effect on the scheme. Unfortunately, the above errors and omissions were not picked up immediately. However,

following a re-cap training session delivered by the author, these problems were rectified. In addition, the data of 43 participants (20%) randomised to the physical activity referral scheme and implementation intentions and Motivational Interviewing condition could not be used due to the deletion of this group from the study. The above resulted in a total of 53 (24%) participants completing the physical activity programme.

Figure 3. Flowchart of participants



The sample consisted of 41 women (77%) and 12 men (23%). The mean age of participants was 53.02 with a range of 19-85 years (SD = 12.52). The sample was ethnically diverse: 22.6% white British, 22.6% black Caribbean, 17% black African, 17% white other, 11.3% Asian, 1.9% mixed (white and black African) and 7.5% did not disclose their ethnicity. Thirty percent of participants at

baseline self-reported to having already met the study aim of partaking in 30 minutes of moderate intensity physical activity on three days of the week.

All referring practices were located within the most socioeconomically disadvantaged areas of Haringey. Patients attending their practice for either routine consultations or for attendance at specific clinics, for example, obesity, CHD or Diabetes, and who met the study inclusion criteria were eligible for referral onto the scheme following a basic assessment and risk stratification by their general practitioner (GP) or practice nurse. The referring health professional completed a referral form that the patient was required to sign and date to confirm that they consented to their relevant health information being sent to the scheme personnel, which was necessary to enable a tailored physical activity programme to be designed for the patient. The patient was also informed by the referring health professional that they would be invited to take part in a study by the scheme staff at their assessment appointment. The exercise practitioners were responsible for inviting patients to take part in the study and for obtaining patient consent. All exercise practitioners received thorough training from the author on how to obtain informed consent from patients for participation in the study (outlined below).

The completed referral forms from the practices were sent to the Physical Activity Referral Scheme Co-ordinator who was responsible for checking the patients' eligibility to participate in the scheme. This procedure was carried out to ensure that the inclusion and exclusion criteria for participation were enforced by the referring health professional, which included a list of absolute contraindications for exercise based on current guidelines.

If the patient met the scheme criteria (based on the information provided by the health professional and further screening of the referral form by the Scheme Co-ordinator), written confirmation was sent to the patient who was advised to

activate their referral by calling the administration office. At this point the patient was booked in for their assessment appointment. However, several months into the study it was found that many eligible patients were not activating their referrals, which was adversely affecting the recruitment process. The author decided to instead send a date for the assessment appointment to patients once it was determined that they met the scheme criteria which improved the situation. The assessment appointment and all future appointments, which formed the intervention (a detailed outline of the interventions is given below), took place at a local leisure centre where some of the group exercise sessions were held.

2.6 *Inclusion Criteria*

The inclusion criteria were: inactive or moderately inactive as classified by the Department of Health General Practice Physical Activity Questionnaire (GPPAQ), a brief tool designed for use within primary care to assess the current physical activity status of a patient and to help in making decisions about when an intervention to increase physical activity might be appropriate (DH, 2006c). Within the questionnaire inactivity is defined as having a sedentary job and no physical exercise or cycling, whilst moderate activity is defined as having a sedentary job and some, but less than one hour of physical activity per week, or having a standing job and no physical exercise or cycling. In addition, patients referred had at least one of the following conditions:-

Hypertension (>140/90)

Obesity (body mass index >30)

Hyperlipidemia (at least 5.2 mmol/L)

Type II diabetes

Stroke

Peripheral vascular disease

Established CHD

Severe mental illness (must be formally classified as having a severe mental illness, eg. Schizophrenia or bi-polar as per the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV) diagnoses).

Fifty-seven percent of participants were referred to the physical activity referral scheme to improve more than one health condition. Seventy-seven percent of participants were obese (BMI >30), 45% were hypertensive (>140/90), 30% had type II diabetes, 25% had hyperlipidemia (> 5.2 mmol/L), 4% had a severe mental illness and 2% had experienced a CVA.

2.7 *Rationale*

The above criteria was selected as people with the above long-term conditions are amongst the most inactive population groups and have the most to gain from increasing their levels of activity. In addition, the health of people with severe mental illness is poor compared to the general population. People with a diagnosis of schizophrenia or bipolar disorder are more than twice as likely to have diabetes than other people and are also more likely to experience CHD, greater levels of obesity, stroke and high blood pressure. They have a tendency to lead inactive lifestyles and are almost twice as likely to die from CHD than the general population (DH, 2006). Therefore, there was a need to specifically target this patient population.

The above criteria is in line with Department of Health guidance on Exercise Referral (DH, 2007) which states that commissioners, practitioners and policy makers should provide exercise referral schemes for their local population where they address the medical management of long term conditions.

2.8 *Exclusion Criteria*

The exclusion criteria were based on current recommended guidelines and are classified as absolute contraindications for exercise:-

Unstable angina

Active pericarditis or myocarditis

Systolic blood pressure >180mmHg or resting diastolic blood pressure >100mmHg

Resting tachycardia >100bpm

Uncontrolled atrial or ventricular arrhythmias

Unstable or acute heart failure

Recent embolism; thrombophlebitis

Unstable diabetes

Febrile illness

In addition, all participants had to meet the following criteria:-

1. No acute mental health problems/not in crisis
2. Not in immediate danger to self or others
3. Coherent and able to understand instructions and be able to understand the nature of the study.
4. Orientated to time, place and person

2.9 The Interventions

2.9.1 Assessment Appointment

At the Assessment Appointment all participants completed a Physical Activity Readiness Questionnaire (PAR-Q) Form to assess their suitability to participate in regular physical activity. The scheme staff took three basic measurements: blood pressure, height and weight in addition to confirming the physical activity status of the participant. All those meeting the scheme criteria were then formally accepted onto the scheme. The set up of the scheme was then explained to the participant, including the duration of the programme, the types of activities available, along with other general information such as attire to be worn to the sessions.

At this point the participant was invited to take part in the study after having been informed of this by the referring health professional. They were given a thorough explanation of the study and what their involvement would be. All participants were given a Personal Information Sheet outlining the purpose of the study, the procedures and the consequences of participation (see Appendix 1). In addition to the written clause within the Personal Information Sheet regarding patient confidentiality and anonymity, all patients were also given a verbal guarantee of this from the exercise practitioner. Coupled with this, if the participant required additional time to decide whether to take part in the study, further time was given. Written consent, by way of an Informed Consent Form (see Appendix 2) was obtained from all participants who decided to take part in the study, which was signed and dated by both the participant and the exercise practitioner. Participants were informed that they would be free to withdraw from the study at any time, and assured that whether or not they decided to participate would in no way affect their treatment at that point in time or in the future. They were also given the opportunity to ask any questions about the study.

Participants were given a pedometer (a discrete motion sensor device worn at the waist to measure the total number of steps accumulated throughout the day or per specified period of time) and both written and verbal instructions on how to use it (Appendix 3). They were asked to record their baseline level of physical activity over the next seven days without intentionally increasing the level of activity currently undertaken. A walking record sheet was given to each participant to record this information. Participants were asked to return the pedometer and walking record sheet at their next scheduled appointment.

2.9.2 Randomisation Procedure

Participants were randomised into one of three groups using manual non-computerised randomisation in blocks of three carried out by the author who chose blind from a set of three randomly ordered cards (one for each number from one to three, corresponding to the control group and the two intervention groups) and was allocated to the corresponding group.

Prior to the participants formally starting the programme, after random allocation, they were required to attend further appointments, one of which being a first appointment that all participants were required to attend. In addition, subsequent appointments were scheduled, determined by the group participants were allocated to as outlined below:-

2.9.3 Intervention Groups

Control Group (physical activity referral scheme only)

First appointment

1. The first appointment lasted approximately 30 minutes. The participant returned the pedometer and completed walking record sheet. They were required to complete a short pre-intervention questionnaire consisting of

two sections with items relating to personal factors and current physical activity with items to assess the participant's current physical activity patterns and physical activity status (stage of change). In addition, an item relating to the dimensions confidence and importance was also included.

In collaboration with the exercise practitioner, the participant selected two appropriate physical activity sessions to attend and a date to commence the programme. The physical activity options included water-based group exercise sessions, gym-based exercise sessions, group health walks and group-based circuit training sessions (a form of interval training which incorporates both strength and endurance/aerobic exercises). They were also asked to book one further appointment at three months (end of programme).

Three-month appointment

2. At the three-month appointment which lasted approximately 45 minutes, the participant completed a short post-intervention questionnaire with items to re-assess current physical activity patterns, an item relating to physical activity status (stage of change), an item relating to the dimensions confidence and importance levels regarding increasing/maintaining activity levels, and items to assess participants' perception of the service overall in helping them to increase their level of activity.

Six-month follow-up questionnaire

3. At six months (three months after completing the programme) participants were sent a postal follow-up questionnaire with items to re-assess current physical activity, namely current physical activity patterns

and physical activity status (stage of change). This marked the end of their participation in the study.

Intervention Group 1 (physical activity referral scheme and Implementation Intentions)

First appointment

1. The first appointment lasted approximately 45 minutes. The participant returned the pedometer and completed walking record sheet. They were required to complete a short pre-intervention questionnaire consisting of three sections with items relating to personal factors, current physical activity with items to assess the participant's current physical activity patterns and physical activity status (stage of change) and a further item relating to the formation of an exercise implementation intention. The participant was required to form an implementation intention, outlining the three days they planned to implement their exercise goal, namely to partake in at least thirty minutes of moderate intensity physical activity on three days of the week. In addition, an item relating to the dimensions confidence and importance was also included.

In collaboration with the exercise practitioner, the participant selected two appropriate physical activity sessions to attend and a date to commence the programme. The physical activity options included water-based group exercise sessions, gym-based exercise sessions, group health walks and group-based circuit training sessions (a form of interval training which incorporates both strength and endurance/aerobic exercises). They were also asked to book one further appointment at three months (end of programme).

Three-month appointment

2. At the three-month appointment which lasted approximately 45 minutes, the participant completed a short post-intervention questionnaire with items to re-assess current physical activity patterns, an item relating to physical activity status (stage of change), an item relating to the dimensions confidence and importance levels regarding increasing/maintaining activity levels, an item to assess whether they implemented their exercise goal, and items to assess participants' perception of the service overall in helping them to increase their level of activity.

Six-month follow-up questionnaire

3. At six months (three months after completing the programme) participants were sent a postal follow-up questionnaire with items to re-assess current physical activity, namely current physical activity patterns and physical activity status (stage of change). This marked the end of participation in the study.

Intervention Group 2 (physical activity referral scheme and Motivational Interviewing)

1. The first appointment lasted approximately one hour. The participant returned the pedometer and completed walking record sheet. They were required to complete a short pre-intervention questionnaire consisting of two sections with items relating to personal factors and current physical activity with items to assess the participant's current physical activity patterns and physical activity status (stage of change). In addition, an item relating to the dimensions confidence and importance was also included.

The Motivational Interview

A 30-minute Motivational Interview was conducted. The consultation was based on an adapted form of MI (Rollnick et al, 1999), for use when time is limited and was delivered by trained exercise practitioners. Each consultation differed and was unique to the participant, based on their readiness to change and individual needs. However, consultations were delivered within the 'spirit' of MI, using the key techniques and strategies, an example of which is given below:-

1. Establish rapport.
2. Discussion about current physical activity.
3. Assessment of motivation/readiness to change (exploring the two dimensions, importance and confidence).
4. Exchange of information.
5. Exploring the pros and cons of becoming more active.
6. Exploring concerns associated with becoming more physically active.
7. Reducing resistance.
8. Assisting the participant in the decision making process.

During the above consultation, in collaboration with the exercise practitioner, the participant selected two appropriate physical activity sessions to attend and a date to commence the programme. The physical activity options included water-based group exercise sessions, gym-based exercise sessions, group health walks and group-based circuit training sessions (a form of interval training which incorporates both strength and endurance/aerobic exercises). They were also asked to book three further appointments, one month after starting the programme, a further appointment at the two-month point and again at three months (end of programme). Each appointment incorporated a 30-minute motivational interview.

Three-month appointment

2. At the three-month appointment the participant completed a short post-intervention questionnaire with items to re-assess current physical activity patterns, an item relating to physical activity status (stage of change), an item relating to the dimensions confidence and important levels regarding increasing/maintaining activity levels and items to assess participants' perception of the service overall in helping them to increase their level of activity. A final 30-minute motivational interview was conducted with the participant.

Six-month follow-up questionnaire

3. At six months (three months after completing the programme) participants were sent a postal follow-up questionnaire with items to re-assess current physical activity, namely current physical activity patterns and physical activity status (stage of change). This marked the end of their participation in the study.

2.10 Staff Training

2.10.1 Motivational Interviewing Training

All exercise practitioners attended a 2-day Motivational Interviewing workshop in March 2008 conducted by the author, a Motivational Interviewing trainer, which covered the principles underpinning the 'spirit' of Motivational Interviewing. The workshop also covered the key consultation tasks, which included exploring ambivalence (pros and cons of change), assessing motivation/readiness to change using importance and confidence rulers in addition to using this tool to elicit change talk. The training provided exercise practitioners with a range of strategies that could be used with people dependant on their level of readiness to change, including "a typical day strategy", used to both assess and engage with the participant, building

confidence and exploring importance for change, reflective listening, giving information and goal setting.

The workshop was delivered using an interactive model, which included brief trainer-led presentations, group discussions, role-play, small group work and video footage. Emphasis was placed on making the training interactive. Materials were presented in different ways to accommodate different learning styles and the focus was on developing practitioner skills and providing opportunities for the practitioners to practice skills within a safe environment

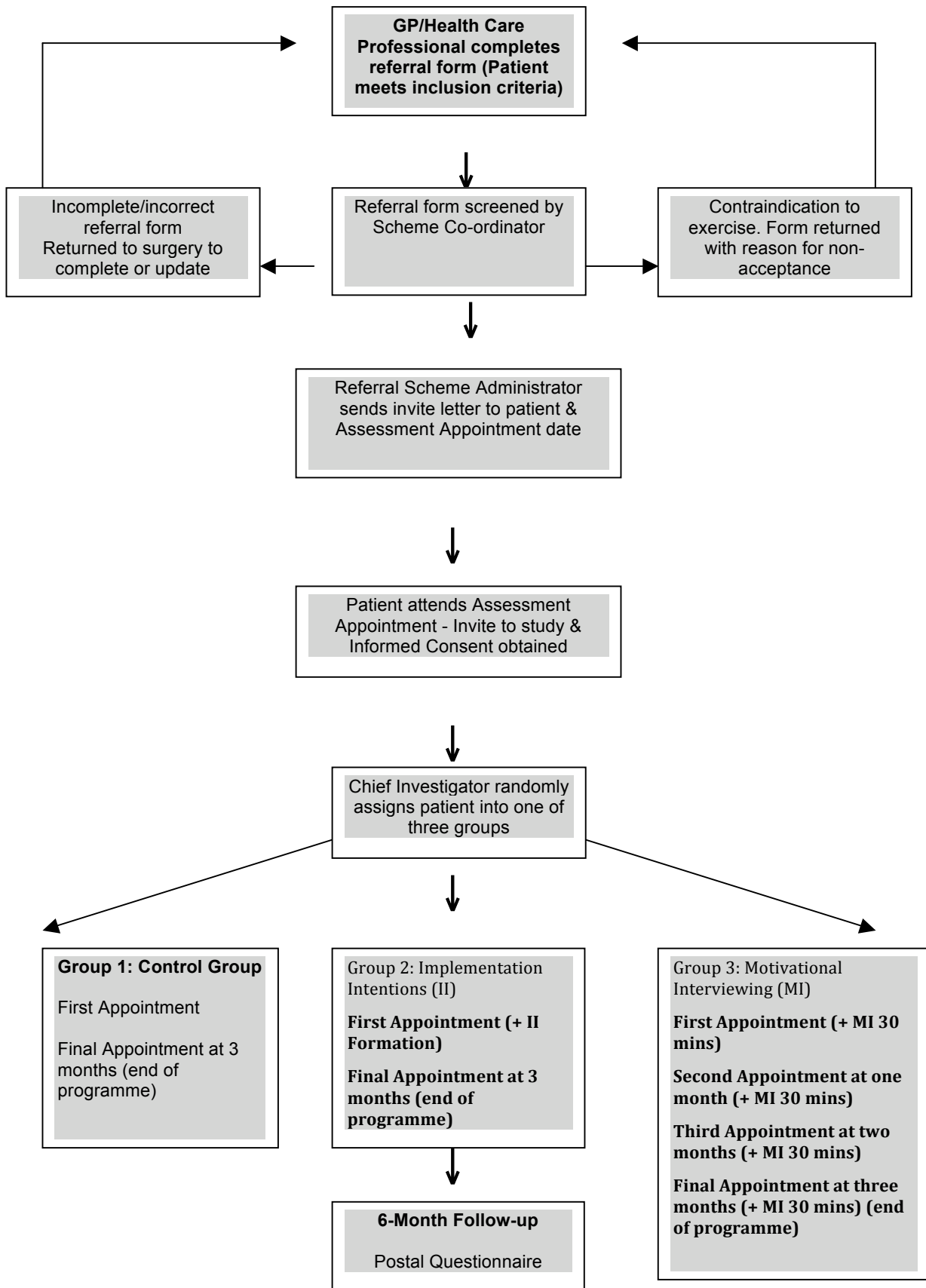
2.10.2 General and Motivational Interviewing refresher training

A further training day was held for all scheme personnel in May 2007 prior to the study starting. In addition, all leisure centre staff were invited to attend the first part of the training, which gave an overview of the scheme. It was of particular importance that reception staff attended this session to ensure that they understood the scheme as they would, in many cases, be the participants' first point of face-to-face contact. The aim of the training was to:-

1. Provide an overview of the scheme and the evaluation process.
2. To introduce study procedures and protocols, including how to obtain informed consent and issues of confidentiality.
3. To introduce exercise practitioners to the scheme paperwork and how it should be accurately completed, including study questionnaires.
4. To provide a 'refresher' Motivational Interviewing training session.
5. To provide a training session on how to work effectively with participants referred with severe mental illness.

6. To provide exercise practitioners with an opportunity to practice conducting simulated consultations of case studies using Motivational Interviewing.

Figure 4. Flowchart of referral pathway



2.11 Outcome Measures

The author developed brief questionnaires primarily to generate an overall perspective on changes to physical activity levels, which included changes in physical activity stage of change. The rationale for this was that assessing physical activity stage of change would provide a broad perspective of behaviour change, picking up subtle and covert, yet important movements in the behaviour change process, for example, a shift from precontemplation to contemplation. Missing such shifts in behaviour change could potentially result in an intervention being deemed unsuccessful. The design of the questionnaire took into consideration the practicalities of delivering the intervention within the given time constraints of the programme.

The questionnaires were piloted with eight participants who attended a physical activity programme not connected to the current study to check face validity.

2.11.1 Questionnaire overview

There is currently no single standard tool for measuring physical activity. The questionnaires contained items to assess the participant's physical activity level (7-day physical activity recall), physical activity status (stage of change, based on the constructs of the TTM) and motivation to change (confidence and importance scores) (Appendices B4, B5, B6, B7 and B8). The baseline questionnaire for the Implementation Intentions group contained an additional paragraph for the participant to indicate the three days they planned to implement their physical activity goal which required them to outline when, where and how they intended to enact it (Appendix B6). In addition the post-intervention questionnaires contained two items related to the participant's perspective of the usefulness of the physical activity referral scheme in assisting them to become more physically active (Appendices B5 and B7).

2.11.2 Physical activity status (stage of change)

Participant's stage of change for physical activity was measured using a 6-item stage algorithm, each representing a stage of the model, previously used by Faulkner et al (2001). An item to identify relapse was included, in addition to two further questions to classify participants into either the precontemplation or contemplation stage of change. The questions asked were:-

- (1) I do not intend to start being physically active again.
- (2) I am thinking of starting to be physically active again.

2.11.3 Physical activity level (physical activity energy expenditure)

Self-reported physical activity was assessed by using an adapted version of the Godin Leisure-time Exercise Questionnaire (Godin and Shepherd, 1985), which is a validated three item self-report measure of exercise behaviour, which assesses the frequency of mild, moderate and vigorous physical activity over an average week. This measure was chosen for its simplicity, in that it is easily understood, brief and reliable (test-retest r_s over 1 month = .24 - .86), and it was felt that administering it would not place too much of a challenge for exercise practitioners and patients alike. In addition, the questionnaire is valid, based on the fact that it is able to demonstrate positive relationships with objective indexes of exercise behaviour, which include maximal fitness test scores and physical activity monitors (Wilson, Rodgers and Fraser, 2002). The original measure assesses leisure-time exercise lasting at least twenty minutes per session. A total physical activity index is calculated by weighting each frequency by intensity and summing for a total score using a formula.

However, for the purpose of this study the questionnaire was adapted to assess whether participants were meeting the current physical activity recommendations and the aims of the study, namely whether their physical

activity levels had increased to thirty minutes of moderate intensity physical activity on three or more days of the week. Therefore, the adapted version of the questionnaire asked participants to think about the last seven days and to state how many times on average they accumulated thirty minutes of mild, moderate and vigorous activity throughout the day, only counting bouts of ten minutes or more. Activities were classified as mild (expenditure of 2.0-4.9 kcal min), moderate (expenditure of 5.0-7.4 kcal min), or vigorous (7.5-9.9 kcal min) (McKardle, Katch and Katch, 1991). A physical activity score was given based on the number of physical activity bouts of mild, moderate or vigorous intensity, of at least ten minutes in duration amounting to at least thirty minutes. The score included all leisure/sport activities, for example cycling, basketball, squash and football, and also included home-based activities such as gardening, heavy/light housework, brisk/easy walking and bowling. Scores were computed for participants at each of the three time points.

Many studies in this area rely on subjective approaches to measure physical activity, namely self-report, which although still useful are often subject to self-report bias (Tudor-Locke, 2002). Therefore, in the current study pedometers (discrete motion sensor devices worn at the waist to measure the total number of steps accumulated throughout the day or per specified period of time) were used as an objective measure of physical activity and to verify self-report.

2.11.4 Questionnaires

Control and Motivational Interviewing Group (Pre-intervention Questionnaire)

The questionnaire consisted of two sections. Section A contained items relating to demographic factors (age and gender). Section B contained two items measuring the participant's stage of change for physical activity using a 6-item stage algorithm, each representing a stage of the model and a 7-day physical activity recall question to assess the participant's current level of activity. A

further section was added to the questionnaire for completion by the exercise practitioner, which related to confidence and importance scores (Appendix B4).

Control and Motivational Interviewing Group (Post-intervention Questionnaire)

The three-month (end of programme) questionnaire was identical to the pre-intervention questionnaire. A third section with two items was added which related to participant satisfaction, namely how useful the participant felt the physical activity referral scheme was in helping them to become more physically active. This was measured using a 10-point likert scale. The second item provided the participant with the opportunity to make any suggestions as to how the physical activity referral scheme could be improved (Appendix B5).

Implementation Intentions Group (Pre-intervention Questionnaire)

The questionnaire consisted of three sections. Section A contained items relating to demographic factors (age and gender). Section B contained two items measuring the participant's stage of change for physical activity using a 6-item stage algorithm, each representing a stage of the model and a 7-day physical activity recall question to assess the participant's current level of activity. A paragraph was added to the questionnaire regarding the formation of an implementation intention that formed Section C. The participant was required to indicate the three days they planned to implement their physical activity goal, namely to partake in three 30 minute bouts of physical activity on three days per week, as follows:-

Research shows that you are more likely to achieve your goals if you make a plan in advance of when you are going to do the activity. Please think about the next 12 weeks and identify the 3 days per week when you will participate in at least 30 minutes of moderate intensity physical activity, and please make a commitment to do so. When you have made

your decision, please complete the table below indicating your chosen activity, the day, when, time and where you will do it.

A further section was added to the questionnaire for completion by the exercise practitioner, which related to confidence and importance scores (Appendix B6).

Implementation Intentions Group (Post-intervention Questionnaire)

The three-month (end of programme) questionnaire was identical to the post-intervention questionnaire for the Control and Motivational Interviewing groups (as above), but consisted of an additional item related to whether the implementation intention had been implemented (Appendix B7).

Post-intervention (6-month) questionnaire – All Groups

This questionnaire consisted of two sections to re-assess physical activity stage of change and current physical activity levels (Appendix B8).

2.12 *Statistical Analysis*

Numerical data from the questionnaires was analysed using the Statistical Package for the Social Sciences (SPSS).

2.13 *Statistical Tests*

2.13.1 Normality tests

To determine whether the data was normally distributed and to test differences across the treatment groups, both numerical and graphical methods were employed which included creating histograms and box plots, probability plots

and in performing tests of normality, such as the Box's M test of homogeneity of covariance matrices and the Levene's test of homogeneity of variance.

2.13.2 Main data analyses

Physical activity level (stage of change and physical activity energy expenditure). Progress in the physical activity stage of change of the TTM and physical activity energy expenditure at baseline, three and six months (expressed in kcal and measured by the 7-day physical activity recall item) were analysed using a multivariate analysis of covariance (MANCOVA) to determine whether there were main effects of the treatment conditions on the participant's physical activity stage of change and physical activity energy expenditure. The variables age, pre-weight, pre-importance scores and pre-confidence scores were entered as covariates.

Physical activity level (step count). Physical activity level was also measured using pedometers, to record the number of steps walked over a 7-day period at baseline and 3 months. An average daily step count was computed. Changes in step count at baseline to 3 months was analysed using MANCOVA to determine whether there were main effects of the treatment conditions on the participants' average daily step count at three months. Step count data was not collected at 6 months. The variables age, pre-weight, pre-importance scores and pre-confidence scores were entered as covariates.

Importance and Confidence. Changes in importance and confidence scores were analysed using a MANCOVA to determine whether there were main effects of the treatment conditions at three months. The variables age and pre-weight were entered as covariates.

Usefulness of the Physical Activity Referral Scheme. Mean scores were computed of the participant's perspective of the usefulness of the intervention in assisting to increase activity levels. Data was collected at three months (immediately post intervention).

2.14 Power Analysis

Using G-Power software it was estimated that a total of 272 participants would be needed based on the assumption that a .40 effect size would be found, if it existed, with a 75% power, which equated to 68 participants in each group. However, for the reasons outlined above, these numbers were not achieved.

2.15. Data collection time-points

2.15.1 Control Group

Measures were collected at baseline, three and six months.

2.15.2 Intervention Group 1 (Implementation Intentions)

Measures were collected at baseline, three and six months

2.15.3 Intervention Group 2 (Motivational Interviewing)

Measures were collected at baseline, three and six months.

2.15.4 6-month questionnaires (control, implementation intentions and Motivational Interviewing groups)

At six months, participants in all groups were sent a questionnaire and a cover letter explaining the purpose of it. Non-respondents were sent a reminder letter

and a further copy of the questionnaire at ten-day intervals. A stamped addressed envelope was enclosed with all correspondence.

3. RESULTS

3.1 *Descriptive Statistics*

A total of 53 participants took part in the study, of which 18 participants (34%) were randomly allocated to the control condition, 16 participants (30%) to the Implementation Intention (II) treatment condition and 19 participants (36%) to the Motivational Interviewing (MI) treatment condition. Thirty-nine participants took part at all three time points to varying degrees (baseline to six months), control group n=11, Implementation Intentions group n= 13 and Motivational Interviewing group n=15.

3.2 *Demographics*

3.2.1 *Gender*

Table 1. Proportion of gender between groups

	Male N	Female N	Total N
Control Group	4 (22.2%)	14 (77.7%)	18
II Group	3 (18.7%)	13 (81.2%)	16
MI Group	5 (26.3%)	14 (73.6%)	19
Total	12	41	53

As can be seen by the frequencies cross tabulated in table 1, the control, implementation intention and Motivational Interviewing groups had the same proportion of females and males, $\chi^2(2) = .29$, $p = .87$.

3.2.2 Age

Table 2. Comparison of age between groups

	N	Mean	Minimum	Maximum	Std. Deviation
Control group	18	52.72	31.00	85.00	12.06
II Group	16	49.75	23.00	73.00	11.45
MI Group	19	56.05	19.00	77.00	13.69

There were no statistically significant differences in age between the control, implementation intention and Motivational Interviewing groups, $F(2, 50) = 1.11$, $p = .337$.

3.2.3 Pre-weight (kg)

Table 3. Comparison of weight (kg) between groups

	N	Mean	Minimum	Maximum	Std. Deviation
Control Group	18	95.75	68	119	16.40
II Control	16	97.15	71	123	14.98
MI Group	19	96.99	69	154	24.33

Differences in weight (kg) were not statistically significant across the three groups, $F(2,50) = 0.12$, $p = .884$.

3.2.4 Ethnicity

Table 4. Proportion of ethnicity between groups

	Control N (%)	II Group N (%)	MI Group N (%)
White British	6 (33.3%)	3 (18.8%)	3 (15.8%)
Black Caribbean	3 (16.7%)	3 (18.8%)	6 (31.6%)
Black African	3 (16.7%)	3 (18.8%)	3 (15.8%)
White other	2 (11.1%)	4 (25.0%)	3 (15.8%)
Asian	2 (11.1%)	1 (6.25%)	3 (15.8%)
Mixed	0	0	1 (5.2%)
Not disclosed	2 (11.1%)	2 (12.5%)	0
Total	18	16	19

The participants were from ethnically diverse backgrounds, the majority being from white British, black Caribbean and black African origin. The values for ethnicity were evenly distributed across the three groups. However, a chi-square analysis was not run as the assumption was violated.

3.3 Comparison between groups at baseline

3.3.1 Physical activity stage of change scores

Table 5. Comparison of baseline physical activity stage of change scores between groups

	Mean	Std. Deviation	N
Control	2.44	1.04	18
II	2.88	1.20	16
MI	2.61	.89	19

There were no statistically significant differences in baseline physical activity stage of change scores between the control, implementation intention and Motivational Interviewing groups, $F(2,50) = 0.72, p = .487$.¹

Table 6. Proportion of participant's stage of change across all groups at baseline, three and six months

	Pre-contemplation	Contemplation	Preparation	Action	Maintenance
Baseline	2%	60%	21%	6%	11%
3 Months	2%	-	17%	62%	19%
6 Months	2%	21%	19%	30%	28%

* The 3 and 6 month values presented are derived from the Missing Value Analysis.

Table 6 presents the proportions of participant's physical activity stage of change classifications at baseline, three and six months across the three groups. A large proportion of participants progressed from the contemplation stage of change to the action stage of change from baseline to three months. However, at six months many participants reverted to the contemplation stage of change, with fewer progressing to the maintenance stage of change. This resulted in similar proportions represented in both the action and maintenance stages.

A Kruskal-Wallis Test found that the physical activity stage of change mean rank scores did not differ significantly at three months ($p = .152$) or six months ($p = .601$) between the control, implementation intention and Motivational Interviewing groups.

¹ The non-parametric equivalent of the chi-square test, the Kruskal-Wallis test, was conducted as the data was non-parametric. The test drew the same conclusions, in that the mean ranks were equal, therefore the data with the means were reported for clarity. See Appendix 9 for tables reporting descriptive information.

3.3.2 Step count scores

Table 7. Comparison of baseline step count between groups

	Mean	Std. Deviation	N
Control	2972.63	1838.93	18
II	4341.73	3362.74	16
MI	3020.08	2236.75	19

Differences in baseline step count scores between the control, implementation intentions and Motivational Interviewing groups were not statistically significant, $F(2, 50) = 1.59, p = .213$.

3.3.3 Physical activity energy expenditure scores

Table 8. Comparison of baseline physical activity energy expenditure scores between groups

	Mean	Std. Deviation	N
Control	581.63	367.33	18
II	621.56	370.43	16
MI	445.92	222.05	19

There were no statistically significant differences in baseline physical activity energy expenditure scores between the control, implementation intentions and Motivational Interviewing groups, $F(2, 50) = 1.45, p = .244$.

3.3.4 Importance scores

Table 9. Comparison of baseline importance scores between groups

	Mean	Std. Deviation	N
Control	9.11	1.10	18
II	8.67	2.01	16
MI	8.27	2.16	19

There were no statistically significant differences in baseline importance scores between the control, implementation intention and Motivational Interviewing groups $F(2, 50) = 1.00, p = .375$.

3.3.5 Confidence scores

Table 10. Comparison of baseline confidence scores between groups

	Mean	Std. Deviation	N
Control	7.53	2.43	18
II	6.90	2.08	16
MI	7.69	2.54	19

There were no statistically significant differences in baseline confidence scores between the control, implementation intention and Motivational Interviewing groups $F(2, 50) = 0.52, p = .597$.

3.3.6 Proportion of participants who met the study aims

Table 11. Comparison of the proportion of participants at baseline between groups who met the study aims of being physically active to at least a moderate intensity for 30 minutes, three times per week

	Mean	Std. Deviation	N
Control	.33	.488	15
II	.50	.516	16
MI	.11	.323	18

There were statistically significant differences in the proportions of participants meeting the study aims at baseline between the control, implementation intentions and Motivational Interviewing groups, $F(2, 50) = 3.27$, $p = .047$. The post hoc test showed that the implementation intention group consisted of a higher proportion of participants who already met the aims of the study. There were no statistically significant differences between the control and implementation intention group ($p = .303$) or between the control and Motivational Interviewing group ($p = .160$). However, the difference between the implementation intention and Motivational Interviewing group was statistically significant ($p = .014$).

Table 12. Proportion of participants meeting study aims over the three time points

Groups	Baseline	3 months	6 months
	N	N	N
Control	5 (33.3%)	12 (30.0%)	7 (29.1%)
II	8 (53.3%)	13 (32.5%)	9 (37.5%)
MI	2 (13.3%)	15 (37.5%)	8 (33.3%)
Groups combined	15 (30.6%)	40 (76.9%)	24 (72.7%)

Table 12 presents the proportion of participants (percentages in brackets) who were physically active to at least a moderate intensity three times per week across the three study time points between groups, in addition to the total proportion of participants who met the study aims across the groups.

3.4 Primary Outcomes

3.4.1 Missing Data

Over the three study time points, the dataset reduced in size leading to 23% missing data at three months, further reducing to 46% missing data at six months. To address the issue of missing data values, a Missing Value Analysis was conducted. Expectation-Maximisation algorithm for missing values imputation (Schafer and Olsen 1998) were applied to each of the missing value datasets. Estimated means were computed for the following variables: baseline, three month and six month physical activity stage of change; baseline, three month and six month physical activity energy expenditure; baseline and three month daily average step count; baseline and three month importance and confidence; baseline and three month weight (kg). The Little's Missing Completely at Random (MCAR) test was conducted which indicated that the data was missing completely at random, $\chi^2(292) = 299.34, p = .373$.²

² There were two sets of data, one with incomplete data and one with complete data where the values were replaced. The analysis was run with both datasets and the conclusions were the same. As there were no differences between the two, the analysis run with the complete dataset was reported. See Appendix 9 for the Missing Value Analysis.

3.4.2 *Effects of Motivational Interviewing and implementation intention on physical activity stage of change and physical activity energy expenditure from baseline to six months*

The potential effects of Motivational Interviewing and the forming of implementation intentions on physical activity stage of change and physical activity energy expenditure were tested using MANCOVA. There were two independent variables, namely treatment condition and time. Treatment condition had three levels (control group, implementation intention group and Motivational Interviewing group) and time had three levels (baseline, three months and six months). The dependent variables were physical activity stage of change and physical activity energy expenditure. The covariates age, pre-weight, pre-importance and pre-confidence scores were input into the model.

Table 13. Mean and standard deviations – physical activity stage of change scores from baseline to six months

Dependent variable: <i>Stage of Change</i>	Baseline		Three Months		Six Months	
	M	SD	M	SD	M	SD
Control Group	2.44	1.04	3.78	0.88	3.49	1.03
II Group	2.88	1.20	4.25	0.58	3.66	1.05
MI Group	2.61	0.89	3.89	0.66	3.77	1.34

Table 13 presents the mean and standard deviations for physical activity stage of change over the three study time points. It appeared that the mean scores for physical activity stage of change were the same at baseline and that they increased at three months, with participants shifting upwards one or two stages. The control and Motivational Interviewing groups shifted from contemplation to preparation stage of change and the implementation intention group from contemplation to the action stage of change. In terms of stage of change classifications, at six months these effects were maintained in the control and Motivational Interviewing groups, but in the implementation intention group

there appeared to be a downward shift from the action to preparation stage of change. Thus, at six months the stage of change classification across all groups was the same, namely preparation.

Table 14. Mean and standard deviations – physical activity energy expenditure scores from baseline to six months

Dependent variable: <i>Physical activity energy expenditure</i>	Baseline		Three Months		Six Months	
	M	SD	M	SD	M	SD
Control Group	581.63	367.33	1001.64	598.10	665.42	446.77
II Group	621.56	370.43	943.13	660.22	805.62	618.16
MI Group	445.92	222.05	898.42	454.92	736.85	510.68

The mean and standard deviations for physical activity energy expenditure scores from baseline to six months are shown in Table 14. There was an increase from baseline in physical activity energy expenditure scores at three months across all three groups that appeared to be equal. Scores decreased across all groups at six months, with the control group scores returning to near baseline values. Scores decreased to a lesser extent in the implementation intention and Motivational Interviewing groups.

The main effect for time was not significant ($F(4, 43) = 1.30, p = .287$), meaning that the scores did not change over time, as was the time by treatment interaction effect, meaning that the groups changed in the same way over time, ($F(8, 88) = .58, p = .796$). The analysis did not show statistically significant differences between groups in the physical activity stages of change scores over the three time points from baseline to six months ($F(2, 46) = .85, p = .433$). There were no statistically significant differences between groups in physical activity energy expenditures scores over the three time points from baseline to six months ($F(2, 46) = 1.04, p = .360$).

3.4.3 *Effects of Motivational Interviewing and implementation intention on daily average step count from baseline to three months*

As there were only two data collection time points for the step count variable, a further MANCOVA was performed. There were two independent variables, namely treatment condition and time. Treatment condition had three levels (control group, implementation intention group and Motivational Interviewing group) and time had two levels (baseline and three months). The dependent variables were stage of change, physical activity energy expenditure and step count. The covariates age, pre-weight, pre-importance and pre-confidence scores were input into the model.

Table 15. Mean and standard deviations – daily average step count

Dependent variable: <i>Daily average step count</i>	Baseline		Three Months	
	M	SD	M	SD
Control Group	2972.63	1838.93	4667.06	1836.57
II Group	4341.73	3362.74	5061.05	3639.81
MI Group	3020.08	2236.75	4336.61	1854.22

The mean and standard deviations of daily average step count in table 15 show that mean step counts across all groups increased from baseline at three months. Greater increases were observed in the control and Motivational Interviewing groups.

The main effect for time was approaching significance ($F(3, 44) = 4.65, p = .06$) meaning that regardless of group, participants had higher scores at three months ($M = 4688$) than at baseline ($M = 3444$). The time by treatment interaction effect was not significant ($F(6, 90) = .396, p = .880$) meaning that the groups changed in the same way over time. However, there were no statistically significant differences between groups ($F(2, 46) = 2.00, p = .147$).

3.5 Secondary Outcomes

3.5.1 *Effects of implementation intention and Motivational Interviewing on motivation to change measured by importance and confidence scores*

The potential effects of Motivational Interviewing and the forming of implementation intentions on importance and confidence scores were tested using MANCOVA. There were two independent variables, namely treatment condition and time. Treatment condition had three levels (control group, implementation intention group and Motivational Interviewing group) and time had two levels (baseline and three months). The dependent variables were importance and confidence. The covariates age and pre-weight were input into the model.

Tables 16 and 17 show that participants' confidence in their ability to increase their levels of physical activity was high at baseline, as was importance of becoming more physically active. Confidence and importance scores across all treatment groups increased from baseline at three months.

Table 16. Means and standard deviations - Importance

Dependent variable: <i>Importance</i>	Baseline		Three Months		Minimum	Maximum
	M	SD	M	SD		
Control Group	9.11	1.10	9.48	.60	1	10
II Group	8.67	2.00	9.78	.62	1	10
MI Group	8.27	2.16	9.44	.76	1	10

Table 17. Means and standard deviations - Confidence

Dependent variable: <i>Confidence</i>	Baseline		Three Months		Minimum	Maximum
	M	SD	M	SD		
Control Group	7.53	2.43	9.09	.81	1	10
II Group	6.90	2.08	9.15	.72	1	10
MI Group	7.69	2.54	8.98	1.36	1	10

The analysis revealed that there was no main effect of time ($F(2, 47) = 1.77, p = .181$) meaning that scores did not change over time. The time by treatment interaction effect was not significant ($F(2, 96) = 1.32, p = .265$) meaning that the groups changed in the same way over time. There were no statistically significant differences between groups in importance scores from baseline to three months ($F(2, 48) = .87, p = .426$) or in confidence scores from baseline to three months ($F(2, 28) = .20, p = .818$).

3.5.2 Usefulness of the physical activity referral scheme

The mean scores for each group indicate that participants across all groups rated the physical activity referral scheme as useful in helping to increase physical activity levels at three months. Means and standard deviations are presented in table 18. Participants in the Motivational Interviewing group gave the highest ratings. However, scores did not differ significantly between groups ($F(2, 48) = .64, p = .528$).

Table 18. Rated usefulness of the physical activity referral scheme

	Mean	Std. Deviation	N	Minimum	Maximum
Control	8.82	1.47	17	5	10
II	8.80	1.01	15	7	10
MI	9.26	1.15	19	7	10

3.5.3 Participant suggestions for improving the physical activity referral scheme

Few comments were received from participants with suggestions on how the physical activity referral scheme could be improved. The comments are described below:-

- To have more sessions and more choice of sessions at varied times, for example in the evenings and on the weekend. A popular request was for swimming to be an option (7 participants).
- To have more aqua-based sessions at varied times, for example, early evening and the need for some sessions to be mixed so that male participants can also attend (6 participants).
- To extend the duration of the programme beyond twelve weeks (1 participant).
- To have taster sessions prior to choosing activities (1 participant).
- To have more exercise practitioners available to assist during the sessions (1 participant).
- To promote the physical activity referral scheme more widely to ensure that General Practitioners are aware of the service (1 participant).
- To allow participants to have more use of the venue facilities (1 participant).
- To allow participants to attend more than two physical activity sessions per week (1 participant).

3.6 Post-Hoc Power Analysis

A Post-hoc power analysis was conducted to determine the power of the present study, which was calculated to be at the level of 60%, which indicates that the sample size was too small to detect effects, if any existed.

4. DISCUSSION

The present study examined the effects of using two psychological approaches to increase and maintain the physical activity levels of inactive adult patients with long-term conditions referred to a physical activity referral scheme from socioeconomically disadvantaged areas within a London borough. A total of fifty-three patients referred from primary care completed the 12-week physical activity referral scheme programme, of which a total of thirty-five participants additionally received a psychological intervention, involving either augmenting a behavioural intention with an implementation intention to assist with the enactment of a physical activity goal or receiving a Motivational Interviewing based intervention.

The main study hypothesis, that a physical activity referral scheme using Motivational Interviewing or implementation intentions would increase physical activity levels in sedentary patients with long-term conditions, more so than a physical activity referral scheme on its own at three and six months was not supported. Progress in participant's physical activity stage of change and increases in physical activity energy expenditure, as measured by 7-day physical activity recall indicate that participants increased their activity levels from baseline to three months. The results further indicate that such increases were maintained somewhat at six months. In addition, marginally significant increases in average daily physical activity step count from baseline to three months were evident. However, the observed improvements in physical activity levels were not dependant upon the Motivational Interviewing and implementation intentions treatment conditions and these increases were not statistically significant.

The secondary aim of the present study was to determine whether participants' motivation to change their physical activity behaviour, as measured by importance and confidence scores, would increase following a Motivational Interviewing or implementation intentions based intervention. However, the findings illustrate that motivation to change, in terms of importance and confidence levels were equal across the experimental and condition groups. A further secondary aim was to examine the participant's perspective of the usefulness of the physical activity referral scheme in assisting to increase their physical activity levels. The study findings indicate that participants across all treatment conditions equally viewed the physical activity referral scheme positively.

There are many possible explanations as to why significant differences between groups were not detected through the physical activity stage of change, physical activity energy expenditure and daily average step count measures. The discussion that follows examines possible reasons why the predicted effects were not observed and considers the conceptual and practical implications of this study under separate headings. The discussion will focus on issues of treatment fidelity within the current study; an area that the author believes in the main, may explain the research findings.

4.1 Treatment Fidelity

One of the main explanations for the observed study results could be due to issues of treatment fidelity. Firstly, exercise practitioners were new to the concept of Motivational Interviewing and client-centred counselling, and they had no prior experience or training in delivering behaviour change interventions. The Motivational Interviewing based intervention was carried out by the exercise practitioners after relatively brief training, and the effects of the treatment may have been smaller to those that could perhaps have been achieved by more experienced practitioners from different fields. The delivery of the Motivational Interviewing intervention was unlike the work the exercise

practitioners had been professionally trained to deliver, as their work typically focuses on the design and delivery of exercise programmes and in giving advice and information about the benefits of physical activity. As reported by Rollnick (1996), practitioners already familiar with client-centred approaches such as psychologists and social workers generally only require 'add-on' training in order for them to deliver Motivational Interviewing due to their prior experience and professional training. In contrast, practitioners such as dietitians and general practitioners would typically require more training, as they often use less effective directive behaviour change approaches (Rollnick et al, 2008). This illustrates how acquiring skills in Motivational Interviewing may have proven particularly difficult for exercise practitioners, as this approach is somewhat far removed from their regular practice.

The standardisation of health behaviour change interventions using approaches such as Motivational Interviewing is extremely difficult to achieve, particularly if the intervention is not being delivered by one practitioner, as was the case in the present study. The issue of treatment fidelity in behaviour change research has been highlighted as a topic of major concern (Bellag et al, 2004; Lane et al, 2005). Treatment fidelity refers to the extent to which an intervention has accurately adhered to the stated protocol. The rationale for implementing treatment fidelity practices is that it has the potential to improve the reliability and validity of interventions. However, few tools or strategies have been developed to specifically measure treatment fidelity in behaviour change interventions, but of those available include the Behaviour Change Counseling Index (BECCI) (Lane et al, 2005) the Motivational Interviewing Skill Code (MISC) (Miller, 2000) and the Motivational Interviewing Treatment Integrity (MITI) Coding System (Moyers, Martin, Manuel, Miller and Ermst, 2007).

The BECCI was designed to measure practitioner competence in behaviour change counselling, an adaptation of Motivational Interviewing suitable for use in brief behaviour change consultations. This tool was designed for use by both

behaviour change trainers and researchers to assess changes in practitioners before, during and post behaviour change training. It is designed to provide insight into the standard to which practitioners were trained to deliver behaviour change counselling as an intervention (Lane et al, 2005). The MISC (Miller, 2000) was designed for use as a research tool, for measuring adherence to Motivational Interviewing using audiotaped or video recorded consultations and is made up of three components. The first component analyses global ratings for the practitioner, the client and the interaction between them, focusing primarily on the 'spirit' of the consultation. The second component measures the frequency of both practitioner and client behaviours, and the third computes talk time for the practitioner and the client.

The MITI Coding System (Moyers et al, 2007) is a measurement tool that differs from the MISC in that it only measures practitioner behaviours and is a brief measure in comparison. It was designed to answer the following questions: "how much is the treatment like Motivational Interviewing?" or "how can practitioners improve their Motivational Interviewing skills?". The measure consists of two components, namely global scores and behaviour counts. Global scores are the scores given by raters on their overall impression of an audio-taped Motivational Interviewing consultation based on 5 global dimensions, including evocation, collaboration, autonomy/support, direction and empathy. Behaviour counts refer to the number of specific practitioner behaviours counted by the coder. The MITI was designed for use as a treatment integrity measure for Motivational Interviewing studies and as a tool to assist in feeding back information about ways to improve Motivational Interviewing skills in practice. In addition to the above three measurement tools, the National Institutes of Health Behaviour Change Consortium (BCC) have developed useful and practical recommendations on how to incorporate treatment fidelity into practice to improve research practice in this area, thus allowing for more confident research conclusions to be made. This resulted in the development of a five stage treatment fidelity model. The first three stages focus on the practitioner whilst the remaining two focus on the patient/participant.

- (1) *Research design* to ensure that the research is in fact testing the study hypothesis and to plan for any setbacks.
- (2) *Monitoring and improving practitioner training* to ensure that practitioners have been trained to a satisfactory level to deliver the intervention and to monitor this over the period of the intervention.
- (3) *Monitoring and improving delivery of treatment* to assess whether the intervention has been delivered effectively. This involves having procedures in place to standardise training delivery and to check that practitioners have adhered to the intervention protocol.
- (4) *Monitoring and improving receipt of treatment* to measure the extent to which the participant/patient, during the course of the intervention, is able to understand the information they were presented with, perform the behavioural skills or use the cognitive strategies they were taught in the intervention.
- (5) *Monitoring and improving enactment of treatment skills* to assess what skills the participant/patient has used in real life situations, namely the cognitive or behavioural skills they were taught.

A limitation of the present study was that within the study design the author did not develop a specific plan to improve and monitor treatment fidelity and in failing to do so the issue of treatment fidelity was not adequately addressed. This was the case regarding the training aspect, in addition to the delivery of the Motivational Interviewing intervention. The study was not designed to assess the Motivational Interviewing skill acquisition of the exercise practitioners, or to check that the intervention was being delivered as intended, but focused instead on participant outcomes. As previously reported, non-significant findings were revealed in the present study. It is possible that the results may have in part been due to the delivery of an ineffective Motivational Interviewing intervention. On this basis, there is a high risk that other promising Motivational Interviewing

interventions which have not found significant results may be disregarded due to researchers failing to assess treatment fidelity within behaviour change research, a view shared by Bellg et al (2004).

A further limitation of the study concerns the possibility that there may have been differences amongst exercise practitioners in their Motivational Interviewing skill level which may have impacted on the study outcomes, or that their skill levels changed over the intervention period that went undetected. Theoretically, had assessments of Motivational Interviewing treatment fidelity been carried out concerning intervention delivery, a deterioration in practitioner skills could have been detected and measures put in place, for example, to up-skill the practitioners with additional training. This in turn would have the potential of avoiding a negative impact on the internal validity of the study. In addition, assessing treatment fidelity for the training delivery would have determined whether exercise practitioners were trained to an appropriate level to deliver the Motivational Interviewing intervention to start with. However, it is important to highlight the fact that efforts were made in the present study to improve treatment fidelity, in that all exercise practitioners received training in the same manner, which was delivered by the author and a further Motivational Interviewing practitioner, both members of the Motivational Interviewing Network of Trainers (MINT). Formed in 1997 by the founders of Motivational Interviewing, MINT is an organisation that aims to improve the standard of counselling and behaviour change consultations, and is made up of trainers in Motivational Interviewing and other similar approaches.

Further attempts were made to apply treatment fidelity in ensuring that all exercise practitioners received identical training materials in order to standardise the delivery of the training to some extent, for example, the author developed a simple Motivational Interviewing flowchart which acted as a prompt sheet for exercise practitioners to aid the delivery of the intervention (Appendix 10). In addition to attending the 2-day Motivational Interviewing training

course, two months prior to the start of the intervention, all exercise practitioners also attended a one-day refresher training workshop delivered by the author, half of which was dedicated to Motivational Interviewing, that provided practitioners with a further opportunity to practice using role play.

Future Motivational Interviewing studies should ensure that the competencies of practitioners are evaluated using reliable measures such as the Behaviour Change Counseling Index (BECCI) (Lane et al, 2005), the MISC (Miller, 2000) or the MITI (Moyers et al, 2007) to examine whether the experiment was a true test of the proposed intervention, in this case that exercise practitioners were delivering the Motivational Interviewing intervention as intended and consistently throughout the study period. Unfortunately, treatment fidelity was not rigorously applied to the present study due to other competing study demands in addition to staffing and financial constraints, which made this an impractical option. In common with other physical activity interventions, the current study was delivered on a low budget, impacting on what could be feasibly delivered. However, future studies could be improved greatly by addressing these issues.

Applying treatment fidelity to the behaviour change research will facilitate in the more accurate interpretation of research findings, thus allowing more confident conclusions to be made about the effectiveness of these interventions. This will assist both those who design and those who commission behaviour change interventions to select those which are most effective, in terms of behavioural and treatment outcomes. As highlighted by other researchers in this area (Dunn et al, 2001; Bellg et al, 2004), treatment fidelity should be made a key component of the delivery and evaluation of future health behaviour change research. This is of particular importance in the area of physical activity, a field less researched than other health behaviours. The results of the present study may be a reflection of some of these issues. However, as aforementioned, funding for health behaviour interventions in the UK compared to that allocated to medical

interventions for disease is very low (POST, 2007) which may hinder progress in this area. This is an area of concern as employing treatment fidelity strategies, although extremely important, may well be expensive and time-consuming, thus presenting major barriers in the real world. However, as highlighted by Bellag et al (2004), in not addressing treatment fidelity, money and time may be wasted on research, in addition to the findings of such studies being questionable.

4.2 Social desirability reporting and the understanding of physical activity recommendations

A further explanation for the research findings centres on issues of social desirability bias, which is a common problem within health research (Mitchie and Abraham, 2004). It is possible that at baseline participants over-estimated their physical activity behaviour by giving more socially desirable responses to the 7-day physical activity recall questionnaire items, in this case to please the exercise practitioners by falsely claiming to have adhered to the physical activity programme to avoid being viewed negatively. As a result this may have confounded the results of the study, for example, by masking the effect of a treatment condition. However, pedometers were used as an objective measure of behaviour to validate self-report (albeit that pedometer reporting is also based on self-report), which may have reduced the possibility of such biases in the reporting and served to strengthen the design of the study. It is also important to point out that many studies conducted within the area of behaviour change have relied on self-report and there is evidence to suggest that self-reported health-related behaviour is a reliable source (Abraham and Hampson, 1996).

It is also possible that participants may have held misconceptions about what constitutes a physically active lifestyle and therefore responded to the questionnaire items based on this mis-information. In recent years the importance of physical activity has been highlighted within the media, which has lead to much energy being put into increasing the promotion of the Chief Medical

Officer's physical activity recommendations (DH, 2004), that focus on achieving moderate intensity physical activities on five or more days of the week. In contrast, much less attention has been placed on determining whether the general public actually understands this recommendation. In the US, media experts have suggested that they are unclear about the content of the current recommendations (Rice, Heesch, Dinger and Fields, 2008), which are identical to those promoted in the UK. This suggestion is supported by studies that have shown awareness about the moderate intensity physical activity recommendations to be low, even amongst health care professionals (Gould et al, 1995). Thus, little is known about whether physical activity mass media messages are fully understood and whether the general public understands the important component of the message concerning moderate intensity. This is a very new research area within the US (Rice et al, 2008) and to the author's knowledge this topic has not yet been studied in the UK. What is known within the UK, based on a large key national survey, is that 80% of people perceive themselves to be more active than they actually are (Allied Dunbar National Fitness Survey, 1992).

Rice et al (2008) conducted a US two-group randomised controlled trial in the UK consisting of female participants only to assess whether they were able to demonstrate a moderate-intensity walking pace following exposure to a physical activity mass media message focusing on activity of a moderate intensity without having first practiced walking at this pace. A further study aim was to determine whether such an exposure would lead to increased knowledge in the participants of the recommendations. The findings of the study revealed that knowledge about physical activity recommendations increased amongst the female participants who were not active at the recommended levels but who were exposed to the message. However, further results showed that significantly more participants in the information plus walking practice group were able to maintain a moderate to vigorous intensity walking pace for ten minutes. The authors concluded that mass media physical activity messages would be better enacted if the inactive general population were better supported to understand

the current recommendations by, for example, providing opportunities to experience and practice moderate-intensity physical activities.

This study goes some way to providing an explanation of the non-significant findings of the present study. In the absence of a thorough understanding of the current physical activity recommendations by study participants, in particular the component regarding moderate intensity, this could have led to social desirability bias and answers given based on lack of knowledge. However, over the study period exercise practitioners interacted regularly with the participants and promoted the moderate intensity physical activity message at every session, for example, through monitoring the participants' rates of perceived exercise exertion to assess whether moderate intensity physical activity levels were being achieved and adhered to. As a result, participants' knowledge in the above two areas are likely to have increased, leading to more accurate self-reporting at the three and six month time points. If this were the case, a significant increase in physical activity levels from baseline to 3 months (end of intervention) may have potentially gone undetected due to social desirability responding and lack of knowledge at baseline, due to the participants over estimating physical activity levels at baseline.

In further support of this line of argument, it is important to remind the reader that prior to referring patients to the physical activity referral scheme, health care practitioners were required to assess the physical activity status of patients using the General Practitioner Physical Activity Questionnaire (GPPAQ) (DH, 2006), designed to help health care practitioners identify those who are amongst the most inactive and therefore in the most need of a physical activity intervention. In doing so, this would ensure that only those patients classified as inactive were referred. To minimise and detect social desirability reporting in future studies using self-report measures where no accurate objective measures are available, or where their use is impractical, studies may benefit from adopting the approach of using a social desirability scale to improve the validity

of questionnaire measures. In addition, to the authors' knowledge, in the UK no studies have been carried out to assess whether the general population are able to accurately interpret the current physical activity recommendations. There is a need for such research in the UK to provide insight into this area, because as found in the US, many people in the UK may also find physical activity messages confusing. Additionally, not knowing whether people understand the moderate physical activity message will inevitably hinder progress in helping people to meet the guidelines for physical activity to improve their health.

4.3 *Physical activity measures*

Although assessing stages of readiness to change using self-report methods is convenient for research purposes, it has its drawbacks. Similar to the problems presented above, misunderstandings about physical activity recommendations can result in participants classifying themselves incorrectly. For example, in the present study individuals may have classified themselves as being in the action stage of change for physical activity behaviour when in fact they were sedentary and only engaging in very low levels of activity, thus failing to meet the criteria for being physically active. This illustrates the potential problems associated with using baseline staging information within the present study, which if proven true may have adversely affected the results. Stages of readiness to change frameworks using self-report methods should be used with caution, and when used in future research studies it would be useful to develop additional questionnaire items to assess knowledge base regarding current physical activity recommendations, which would assist in verifying stage of change self-report responses.

In addition, a strength of the present study was that pedometers were used as an objective measure of physical activity, which served to validate self-report. However, this too was not without problems. Evidence is accumulating that pedometer use is associated with significant increases in physical activity in the short term. Bravata et al (2007) conducted a systematic review of twenty-six

studies (eight RCT's and 18 observational studies) with a total of 2,767 participants to examine whether pedometer use increased physical activity and improved health. The analysis of the RCTs found that pedometer users increased daily step count significantly by 2,491 steps more than the control participants. This evidence suggests that the very nature of the device is enough to result in an increase in physical activity levels without the need for further intervention.

Within the present study, increases in activity were seen across all groups from baseline to three months, although more modest increases were seen compared to the findings of Bravata et al (2007). In the implementation intention group, daily average step count increased by 720 steps, the Motivational Interviewing group by 1,316 steps and the control group by 1,695. Interestingly, the mean daily average step count for the control, implementation intention and Motivational Interviewing conditions were 2,973, 4342 and 3020 respectively at baseline. A daily average step count of less than 5,000 is considered to be that of a sedentary individual (Tudor-Locke and Bassett, 2004). Additionally, the mean physical activity energy expenditure for each group was 582, 622 and 446 kilo calories per day for the control, implementation intention and Motivational Interviewing conditions respectively, which are also indicative of low levels of physical activity. This highlights the fact that there was a high probability that social desirability reporting was evident in this study at baseline, in that study participants were over-estimating the amount of physical activity they were engaging in.

Although useful for monitoring the accumulation of daily steps, a pedometer is not an ideal measure for use for research purposes, as it has not been validated as being a reliable measure for these purposes. In addition, their accuracy is also dependant upon the user putting on the device each morning to record the data prior to commencing activity and taking it off at night when activity ceases. It was intended at the study design stage that a sub-group of participants from each treatment group would be randomly assigned a non-invasive body

monitoring system device, namely the SenseWear Pro2 Armband (Bodymedia, 2006). This device provides a more accurate assessment of physical activity levels than the pedometer, in that it measures both intensity and duration of physical activity, in addition to measuring daily step counts, thus improving the study validity. However, due to staffing and time constraints it was not possible to use them within the present study. It would be of interest for future studies to use such monitoring devices, which will serve as a more robust objective measure of actual physical activity behaviour.

In the present study the stage of change questionnaire items were brief to facilitate completion during the timescale of the appointments and were based on one used in a previous study (Faulkner et al, 2001). Some physical activity measures within the present study may have affected the research findings in that the validity and reliability of the developed questionnaires had not been established fully. This should be examined in future studies with a larger sample. To add to the above, the Transtheoretical Model has been used in numerous studies across many health domains and inconsistencies in defining and assessing stages has been identified as a limitation which needs to be addressed.

4.4 Program Factors

Participants across all groups increased their physical activity levels above baseline levels at three months, albeit not a significant finding. A possible explanation for this may have been due to other factors, non-specific to the implementation intention or the Motivational Interviewing based interventions. For example, it could be the mere fact that the health care professional took interest enough to refer the patient to the physical activity referral scheme to improve their health that proved to be a sufficient motivator in itself. A further explanation is that the effect of the exercise practitioner alone may have been enough to motivate change, as with regards to formal and structured exercise, the exercise psychology literature suggests that they are likely to be the most

important variable affecting adherence to physical activity regimes (Willis and Campbell, 1992). In further support of the latter point, reviews of the effectiveness of interventions in community settings found that regular contact with an exercise practitioner improved adherence (Health Development Agency, 2005). This is a plausible explanation as physical activity levels increased at three months and had decreased somewhat by the six months stage, when contact with the exercise practitioner ceased.

All health behaviours are in some way influenced by social context, including physical activity (Dishman, 1994). Social support is considered to be the most significant factor of the psychological factors affecting exercise adherence (Willis and Campbell, 1992). It is reasonable to suggest that participants derived peer support from each other and that once the programme ended at three months, their motivation to continue on their own was diminished due to the loss of this support. Future studies are required to identify factors that mediate the success or failure of physical activity interventions related to social support.

4.5 Implementation Intentions

As previously discussed, motivation can be understood by examining two dimensions, that of importance and confidence (Miller and Rollnick, 2002). The present study measured importance and confidence to examine whether treatment condition would have an effect on their scores, and in turn if importance and confidence increased whether this would result in increased levels of activity. The mean scores of importance and confidence indicate that study participants were already highly motivated to change their exercise behaviour prior to the start of the study. If this were true then it is reasonable to suggest that the need for a plan, namely an implementation intention, was not great, and that physical activity behaviour was perceived not to be a difficult behaviour to engage in. This suggestion is further supported by the fact that in the present study, participants in the control group also increased their activity level, albeit in the short-term and not statistically significantly. However, as

previously discussed, increases seen in the control group may have been due to pedometer effects.

4.6 *Ethnicity*

The study participants were from ethnically diverse backgrounds, which anecdotally caused barriers in participation amongst some participants. For example, the female Muslim participants were unable to take part in many of the activities as they were not segregated in terms of gender, for example, the gym-based sessions and group exercise sessions. Some of the water-based group exercise sessions were for women only. However, as the swimming pool was not closed off from the public, this enabled the sessions to be observed by the general public, which led on at least a few occasions to some women dropping out of the programme or feeling uncomfortable about participating. A number of factors prevented the establishment of single sex sessions to cater for the needs of specific groups of participants, which were due to staffing and financial constraints. This in turn impacted on the number of physical activity sessions that were established and to the needs of some participants not being met.

Participation in physical activity is unequal in some black and minority ethnic groups. For example, Asian populations have the lowest participation rates and barriers to their participation have been identified (Sporting Equals, 2005). People from different cultures may need to adhere to certain environmental and cultural boundaries regarding physical activity participation, such as dress code and not being able to participate in mixed gender physical activity, which can contribute towards low participation rates. Physical activity referral schemes serving areas with high levels of ethnic diversity need to be aware of these issues to avoid such schemes being perceived by people from ethnically diverse backgrounds as inaccessible to them, which will inevitably contribute towards increasing health inequalities.

A further issue within the present study regarding ethnicity concerned language barriers. For many of the participants in the 'other white' ethnic category, particularly those of Turkish Cypriot origin, the use of the English language was somewhat limited. This meant that interpreters had to be used for the assessment and follow-up appointments, which is likely to have affected the study findings, presenting particular problems for the two treatment conditions, implementation intentions and Motivational Interviewing. An issue associated with using interpreters includes the inability to ascertain whether the transfer of meaning between the spoken forms of language have been achieved. In the present study, there was no way for the exercise practitioners to know whether the information given to the interpreter had been translated accurately to study participants, which could have resulted in inaccuracies in responses given to questionnaire items.

The exercise practitioners reported difficulties in conducting motivational interviews with patients through interpreters and had concerns that due to language, participants may not have been able to express themselves fully and freely and to communicate accurate information to exercise practitioners through the interpreters. A further difficulty experienced by the exercise practitioners was in instructing participants on how to form implementation intentions, which again could have adversely affected the results. The interpreters used in the present study were untrained and in all cases were family members or friends, as there were no funds to pay for professional interpreter services. Issues related to using untrained interpreters include the fact that they were less likely to have been occupationally knowledgeable and aware of important information about the service compared to trained interpreters, which could have lead to them conveying inaccurate information to the participant and misinterpreting what the exercise practitioner had said or advised.

All services, including physical activity referral schemes, should ensure that users have the right to effective communication in an appropriate form and language so as not to exclude them from accessing such services. The Race Relations (Amendment) Act 2000 (Office of Public Sector Information, 2000) widens and strengthens the anti-discriminatory Race Relations Act (1976) to help to combat inequalities in health in addition to discriminatory practices in other areas. The amendment to the 1976 Act not only requires public authorities to address unlawful discrimination where it occurs, but also to pro-actively prevent it from occurring. One of the key new duties outlined in the amended Act is to improve access to information and services for people from minority ethnic communities. In translating this Act into practice, this requires health agencies to put in place provisions for accessing high quality interpreting services. However, in the real world a lack of funding often prevents this from being realised, as was the case in the present study.

4.7 Obesity and Adherence

Seventy-seven percent of participants in the present study were obese (BMI >30) which may in part explain the study attrition rates, as evidence suggests that overweight and obesity are factors associated with increased dropout rates, (Jones et al, 2005; Dishman, 1994). Dishman (1994) an expert in the study of exercise adherence, has identified several psychological and physical barriers to physical activity in this group. These include shame of being observed, poor performance, lack of confidence and the burden of excess weight. Added to this, social stigma is very often associated with obesity, most commonly in western societies, with many individuals subjected to overt discrimination that arise from the assumptions and attitudes of others (Stunkard and Wadden, 1992).

It is possible that specific training for staff in the area of obesity would have been beneficial to ensure that they had a deeper insight into the potential structural and psychological barriers to both initiation and maintenance in this patient

group. This is a consideration for future studies and for the design of physical activity programmes targeting this population group.

4.8 Socioeconomic Factors

The participants in the present study were recruited from areas with very high levels of socioeconomic disadvantage. Chinn, White, Harland, Drinkwater and Raybould (1999) conducted a study to understand the barriers to physical activity. Four thousand, one hundred and forty adults took part in the study that involved completing a postal health and lifestyle survey, collecting data on socioeconomic and health status, in addition to knowledge and attitudes about health. The socioeconomic status measure collected specific information regarding housing tenure, education, car ownership and household income. The study findings provided evidence that physical activity participation and perceived barriers to physical activity participation vary according to socioeconomic status (Chinn et al, 1999). As an example, the study suggests that those in the lower socioeconomic groups were more likely to identify financial and transport issues as barriers.

In the present study, socioeconomic factors may have been reflected in the results. However, in developing the physical activity referral scheme in the current study, socioeconomic factors were considered to some extent. For example, the distance to travel to exercise venues was a consideration and so to address this potential barrier physical activity sessions were established within key venues in the communities the referral scheme served. In addition, the participants also had the option of attending physical activity sessions within the main leisure centre serving the wider area. Interestingly, the uptake of attending exercise sessions, which were more local to the participants, was extremely poor as the majority opted to attend the leisure centre. This observation goes against the research findings regarding lack of access to transport being a barrier, as

many participants would have had to travel some distance to attend the leisure centre-based programme.

Financial barriers may also have presented as a barrier to participation post-intervention (at three months). Although the 12-week physical activity programme was free of charge, after it ended participants were given the option of continuing to attend the leisure centre at a subsidised cost for a limited period of time. Many participants expressed interest in continuing attendance at the leisure centre but cited financial constraints as a major barrier. However, a further programme option was for participants to attend regular health walks (supervised, short, moderate intensity walks) that were free of charge. Unfortunately staffing constraints prevented the monitoring of the attendance of study participants in these health walks. On this point, it is important to point out that throughout the programme exercise practitioners raised awareness amongst participants that formal structured exercise programmes was only one approach to increasing physical activity levels. Physical activity as part of daily living, particularly brisk walking, was promoted as an appropriate form of moderate intensity physical activity. This is in line with the findings of a review of reviews which indicated that within community settings moderate intensity physical activity, physical activity that does not require attendance at a leisure facility and unsupervised activities are associated with longer term changes in behaviour (Health Development Agency, 2005). However, in the definition of community settings, those referred from medical settings were not included so these findings should be interpreted with this in mind.

Future interventions that specifically target lower socioeconomic populations need to consider strategies for overcoming potential barriers associated with socioeconomic factors. This study made some effort to address some of the potential socioeconomic barriers, but finances again limited the study.

4.9 Referral Scheme physical activity options

The range of different activities available was limited, as were the times they were on offer. Many participants were interested in evening and weekend options. Due to a combination of staffing and financial constraints only one evening session was timetabled, with no weekend options. It is highly likely that this may have excluded some from participating. As evident from the analysis of the questionnaire item asking for views on improvements that could be made to the physical activity referral scheme, comments focused on the need for an increase in the number, timing and variety of sessions available. However, overall participants across all conditions viewed the physical activity referral scheme as being useful in assisting to increase activity levels. Physical activity interventions should be given appropriate levels of funding to ensure schemes can be fully operational. This scheme was under funded and relied on external funding, which was renewed on a yearly basis. This made planning and programme expansion when the scheme became more popular extremely difficult, coupled with ongoing uncertainty amongst some staff in not knowing for how long their jobs would be secure.

4.10 Lack of study power

An additional limitation of the study concerned the lack of power to detect group differences due to the low number of study participants. Participant numbers were further reduced from three months as many participants did not complete the self-report measures at six months, thus excluding them from the repeated measures analyses. As mentioned previously, most participants drop out of a physical activity programme within the first six months of starting, with the majority dropping out within the first three months (Dishman, 1994). It is possible that the reason for not completing the self-report measure at six months was because participants had not maintained their physical activity levels beyond the life of the intervention, which is in keeping with the exercise adherence literature. A further reason for not detecting any underlying effects could be due to the combined effects of low participant numbers and the 'large'

study design, in having three groups and two to three time points. The author conducted a post hoc power analysis to determine the power of the present study, which found that it was powered to only 60%. A further analysis revealed that a total sample size of 81 participants would be required to achieve 80% power. In light of these calculations it would be unwise to conclude that physical activity interventions using Motivational Interviewing and implementation intention approaches are ineffective. In the case of the current study, the author was aware that participant numbers were low with only 53 participants and therefore it is possible that some effects were present, and if this were the case, it is likely that there was not enough power to detect them. The study should be repeated with a larger sample size.

4.11 Gender

The present study was limited as it consisted of mainly female participants (77%). Future studies should endeavour to achieve a male, female gender balance, as not doing so will limit the generalisability of the findings. In the present study a heterogeneous sample may have altered the results somewhat.

4.12 Study Design

Participants in all three groups received an active intervention in attending the 12-week physical activity programme as the inclusion of a non-treatment control group was not considered to be a feasible option. This was due to the fact that the physical activity referral scheme was a new service long awaited by primary health care professionals and members of the general public who over the years had made enquiries about such schemes, having heard about them via the media and had knowledge of their existence in neighbouring boroughs. Therefore, it was felt that not giving all participants an active intervention would have sparked unrest amongst both the general public and the referrers alike. Participation in the physical activity referral scheme alone may have been enough to effect change and therefore it is possible that as all participants

received an active intervention, effects if present were masked. Thus, future research studies should include a non-treatment control condition.

4.13 Missing data

Due to very low staffing levels it proved extremely difficult for staff to keep up with the demands of the scheme, for example, in ensuring that paperwork was completed, which often lead to questionnaires not being completed fully or accurately and sometimes in the data collected being lost. Scheme staff also found it difficult to keep track and follow up participants referred to the physical activity referral scheme, for example, those who missed their physical activity sessions. Scheme staff themselves suggest that this could potentially have been avoided had they enough time to contact participants by telephone periodically. Unfortunately the demands of the scheme did not allow for this procedure to be put in place.

5. Conclusion

The main purpose of this study was to examine whether implementation intentions or Motivational Interviewing interventions were more effective in increasing and maintaining physical activity levels in the short and long term for a physical activity referral scheme than a physical activity referral scheme on its own. The aim was to extend knowledge in the area of adherence to physical activity referral schemes using psychological approaches to behaviour change. The study findings were not supportive of the study hypothesis. A number of factors may have affected the findings, which have been discussed in detail above.

Facilitating behavioural change within the area of physical activity is complex and challenging. This study has highlighted some of the difficulties associated with conducting a randomised controlled trial in the real world. Despite its limitations, there are some noteworthy strengths of this study, which bring forth some fruitful and interesting future directions for research that will further improve understanding in the area of long-term physical activity participation amongst patients with long-term conditions using psychological interventions. One such area lies in addressing issues of treatment fidelity, for example, in determining whether Motivational Interviewing has been delivered with fidelity and in gaining an insight into the general population's understanding of the current physical activity recommendations. The author proposes that the most significant limitation of the study was the fact that treatment fidelity issues were not adequately addressed. This study requires further testing and should be replicated, fully addressing these issues.

In addition, regarding sample size, future studies should be appropriately powered and a non-treatment condition incorporated into the study design. To gain insight into the reasons for dropping out of the physical activity programme, future studies should use qualitative research methods to determine who drops out and the reasons for doing so to advance knowledge in this area.

Compared to many Motivational Interviewing-based studies, the present study used “real” practitioners, rather than researchers to deliver the intervention, the findings of which are likely to be more valid as it is more authentic and replicates real practice. A further strength is that the study was theoretically driven. Physical activity behaviour outcomes were assessed using multiple measures, thus aiming to capture a well-rounded perspective of changes to physical activity using objective measures, namely pedometers and questionnaire items to detect more covert changes through assessing physical activity stage of change.

Neither Motivational interviewing nor implementation intention approaches were more effective than the physical activity referral scheme on its own, as discussed in detail above. However, due to the limitations of the present study, the findings should be interpreted with caution and it is strongly advised that physical activity interventions should seek funding opportunities to rigorously evaluate them, as there is a great need for more research in this area. As demonstrated in numerous texts, interventions using Motivational Interviewing and implementation intention approaches have proved effective across a range of health behaviours (Ruback et al, 2005; Burke et al, 2003; Armitage, 2007; Sheeran and Orbell, 2000), including those to increase levels of physical activity. With this in mind, physical activity interventions based on these approaches should not be discarded based on the results of the present study. The author is currently collecting further data and will report the findings in the future. The current study has provided insight for a larger study and accordingly it should be viewed as a feasibility study.

Physical inactivity is a growing public health concern in the UK and the need to increase physical activity levels is great, particularly amongst those with long term health conditions who are amongst the least active. Given such low levels of participation, effective strategies are needed to tackle this issue, as one size will not fit all. Health psychology has an important role to play in the development of effective health interventions for both the primary and secondary prevention of long-term conditions and in their evaluation.

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APPENDICES

Patient Information Sheet

Physical Activity Referral Scheme: A randomised controlled trial

We would like to invite you to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

What is the purpose of the study?

The study is being conducted to examine the effectiveness of physical activity referral schemes in helping patients with health problems to increase their level of physical activity.

Why have I been invited?

You have been asked to take part in this study because you have been referred to the physical activity referral scheme. Approximately 272 participants will be involved in the study.

Do I have to take part?

It is up to you to decide whether or not to take part. We will describe the study and go through this information sheet, which we will then give to you. If you decide to take part in the study we will ask you to sign a consent form to show you have agreed to take part. You are free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect the standard of care you receive.

What will happen to me if I take part?

Sometimes we do not know which way of treating patients is best. To find out, we need to compare different treatments. We put people into groups and give each group a different treatment. The results are compared to see if one is better. To try to make sure the groups are the same to start with, each patient is put into a group by chance (randomly). Patients in all groups will be helped to become more physically active in different ways, although you will not know which group you are in. You have a one in four chance of getting the study treatment.

- You will be involved in the research for 6 months although your participation in the physical activity programme will last for 12 weeks.
- All appointments take place at your local leisure centre.
- At your first appointment baseline information will be collected including measures of your height, weight and blood pressure and information regarding your current level of physical activity. You will be formally invited to take part in the study and if you decide to you will be asked to sign a consent form.
- You will then be randomly put into a group.
- Depending on which group you are put into, you will be asked to attend a further 2-3 appointments lasting no more than 60 minutes. At these appointments you may be

asked to complete a questionnaire, discuss your physical activity patterns and/or agree to set yourself a goal for physical activity.

- At your second appointment, in addition to the above, you will be given a basic device and will be asked to record your current level of physical activity over the next 7 days. Under the guidance of the physical activity referral scheme staff you will select which exercise sessions you would like to attend and given a start date.
- At the end of the 12-week programme you will be asked to attend a final appointment. You will be asked to complete a questionnaire. Your current physical activity patterns will be discussed and you will be given options to continue to be active.
- At six months (three months after you complete your 12-week programme) you will be sent a postal questionnaire asking about your current physical activity patterns for you to complete and return to the researcher.

What will I have to do?

You will be expected to attend all scheduled appointments and complete the 12-week physical activity programme. You will also be expected to fill in questionnaires which ask questions about your physical activity patterns.

What are the possible disadvantages and risks of taking part?

The risk of taking part in this study is minimal. However, occasionally in people who have not exercised before, or who have not exercised for a long time, there is a small chance that mild muscle soreness after exercise may be experienced for a short time.

What are the possible benefits of taking part?

Should you participate in this study and continue to exercise on a regular basis, you have the potential to gain numerous health benefits. They include the prevention and management of many health conditions, for example, diabetes, heart disease, stroke, high blood pressure, high cholesterol and weight management.

We cannot promise the study will help you but the information we get from this study will help improve the treatment of people with health problems.

What happens when the research study stops?

When the research study stops, should you be interested, you will be given advice on how to keep active.

What if new information becomes available?

Sometimes during the course of a research study, new information becomes available about the treatment that is being studied. If this happens, exercise referral scheme staff will tell you about it and discuss with you whether you want to continue in the study. If you decide not to continue in the study, arrangements will be made for your care to continue. If you decide to continue in the study you will be asked to sign an updated consent form. If the study is stopped for any reason, we will tell you and arrange your continuing care.

What will happen if I do not want to carry on with the study?

If you withdraw from the study, we will need to use the data collected up to your withdrawal.

What if there is a problem?

If you have a concern about any aspect of the study, you should speak to the researcher [REDACTED]. If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure.

In the event that something does go wrong and you are harmed during the research and this is due to someone's negligence then you may have grounds for a legal action for compensation against Haringey Teaching Primary Care Trust but you may have to pay your legal costs. The normal National Health Service complaints mechanism will still be available to you (if appropriate).

Will my taking part in this study be kept confidential?

Yes. We will follow ethical and legal practice and all information which is collected during the course of the research will be stored securely and kept strictly confidential. Any information about you will have your name and address removed so that you cannot be recognised from it.

Your doctor will be notified of your participation in the study.

What will happen to the results of the research study?

A copy of the research results will be sent to you in December 2008. You will be told which arm of the study you were in. You will not be identified in any report or publication.

Who is organising and funding the research?

The research is organised and funded by Haringey Teaching Primary Care Trust.

Who has reviewed the study?

All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee to protect your safety, rights, wellbeing and dignity. The study has been reviewed and given a favourable opinion by Barnet, Enfield and Haringey Research Ethics Committee.

Contact for further information?

For general information about the research project:-
[REDACTED] (Physical Activity Referral Scheme Co-ordinator)

For specific information about the research project or if you are unhappy with the research:-

[REDACTED] k

Postal address:- [REDACTED]

Advice as to whether you should participate in the study:-
Contact your GP or practice nurse.

If you are unhappy with the research study:-
Contact Vanessa Bogle (Researcher) – details above.

Version No.2
03/05/07

CONSENT FORM

Physical Activity Referral Scheme: A randomised controlled trial

Researcher: Ms Vanessa Bogle

Please initial box

- 1. I confirm that I have read and understand the information sheet dated 12/03/07 (version No.1) for the above study and have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
- 2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.
- 3. I understand that relevant sections of my medical notes and data collected during the study may be looked at by responsible individuals from the City University London, or from the Haringey Teaching Primary Care Trust, where it is relevant to my taking part in this research. I give my permission for these individuals to have access to this information.
- 4. I agree to my general practitioner (GP) being informed of my participation in the above study.
- 5. I agree to take part in the above study.

Name of Patient

Signature

Date

Name of person taking
consent

Signature

Date

When completed, 1 signed copy for patient, 1 for researcher site file; 1 (original) to be kept in medical notes

APPENDIX B3 – Pedometer instructions and record sheet

INSTRUCTIONS FOR USING THE STEP COUNTER

1. The pedometer must be worn all day. Remember to put the pedometer on first thing in the morning and take it off last thing at night.
2. Wear it everyday for seven days.
3. Attach the STEP COUNTER to your belt or to the top of your trousers/skirt/shorts (this should not be made from elastic fabric or your readings will be inaccurate).
4. The unit must be horizontal (straight) to the ground in order for it to work correctly.
5. Press one of the red RESET buttons and hold for about 5 seconds to set the counter to zero.
8. The step counter is now ready for use.
10. Remember to reset the pedometer to zero (press one of the red RESET buttons and hold for about 5 seconds) at the start of each day.
11. Record the total number of steps you walk each day on the enclosed Walking Record Sheet.
12. It is important that you do not intentionally increase the amount of walking you do this week.

If you experience difficulties using the step counter please call

██████████ (Physical Activity Referral Scheme Co-ordinator) on

██ on ██████████

██████ at your earliest convenience. Please leave your name and telephone number on the answering machine service if there is no answer and your call will be returned as soon as possible.

WALKING RECORD SHEET

DAY OF THE WEEK	TOTAL NUMBER OF STEPS WALKED <small>(write number of steps walked for the whole day)</small>
MONDAY	
TUESDAY	
WEDNESDAY	
THURSDAY	
FRIDAY	
SATURDAY	
SUNDAY	
FOR OFFICE USE ONLY <small>(DO NOT WRITE IN THIS BOX)</small>	<small>(DO NOT WRITE IN THIS BOX)</small>

Instructions for completing the Exercise Sheet

1. Please complete this sheet carefully during the week and bring it to your next appointment on _____
2. Please be absolutely honest when completing this sheet. You will not be evaluated negatively or penalised in any way if you do not achieve your goals.
3. At the end of **EACH** day write the total number of steps walked under the column “total number of steps walked”, even if you have stayed at home all day.
4. Please do not write in the row marked “for office use only”.

Thank you for participating in this study



PRE-INTERVENTION PHYSICAL ACTIVITY
QUESTIONNAIRE (Control & MI)

Please Answer ALL questions

Section A
PERSONAL FACTORS

A1. Age (in years):

A2. Gender: Male/Female (circle ONE)

Section B
CURRENT PHYSICAL ACTIVITY

B1. Which statement best describes **your own** current physical activity/exercise patterns (tick ONE only)

- 1. I am not physically active and I do not intend to start. []
- 2. I am not physically active but I am thinking about starting. []
- 3. I am physically active once in a while but not regularly. []
- 4. I am physically active but just started recently. []
- 5. I am regularly physically active and have been for longer than six months. []
- 6. I have been regularly physically active in the past but not now. []

If you selected option 6 above, which one of the statements below best describes your current position? (tick one only)

- I do not intend to start being physically active again. []
- I am thinking of starting to be physically active again. []

B2. Think about the last seven days. How many times on average did you accumulate 30 minutes of the following kinds of activity throughout the day?

Times per week

Vigorous Activity

(heart beats rapidly, breathing hard)
 eg. Running, jogging, squash, hard swimming, cycling, basketball, football, aerobics, etc.

Moderate Activity

(breathing harder than normal and feeling warmer)
 eg. Brisk walking, heavy gardening – digging, mowing.

Mild Activity

(minimal effort, very easy)
 eg. Yoga, easy walking, light housework/gardening, bowling.

Questions adapted from Godin and Shephard (1985)

Thank you for completing this questionnaire.

For Office Use Only:

Confidence Score

Importance Score

12 WEEK PHYSICAL ACTIVITY QUESTIONNAIRE (Control & MI)

Please Answer ALL questions

**Section A
PERSONAL FACTORS**

A1. Age (in years):

A2. Gender: Male/Female (circle ONE)

**Section B
CURRENT PHYSICAL ACTIVITY**

B1. Which statement best describes **your own** current physical activity/exercise patterns (tick ONE only)

- 1. I am not physically active and I do not intend to start. []
- 2. I am not physically active but I am thinking about starting. []
- 3. I am physically active once in a while but not regularly. []
- 4. I am physically active but just started recently. []
- 5. I am regularly physically active and have been for longer than six months. []
- 6. I have been regularly physically active in the past but not now. []

If you selected option 6 above, which one of the statements below best describes your current position? (tick one only)

- I do not intend to start being physically active again. []
- I am thinking of starting to be physically active again. []

B2. Think about the last seven days. How many times on average did you accumulate 30 minutes of the following kinds of activity throughout the day?

Times per week

Vigorous Activity

(heart beats rapidly, breathing hard)
eg. Running, jogging, squash, hard swimming, cycling, basketball, football, aerobics, etc.

Moderate Activity

(breathing harder than normal and feeling warmer)
eg. Brisk walking, heavy gardening – digging, mowing.

Mild Activity

(minimal effort, very easy)
eg. Yoga, easy walking, light housework/gardening, bowling.

Questions adapted from Godin and Shephard (1985)

SECTION C
PATIENT SATISFACTION

C1. How useful was the physical activity referral scheme in helping you to become more physically active? (circle one number).

Useless					Neither helpful /unhelpful					Very useful
1	2	3	4	5	6	7	8	9	10	

C2. Can you suggest any improvements to the physical activity referral scheme? Please describe below.

Thank you for completing this questionnaire.

For Office Use Only:

Confidence Score

Importance Score

PRE-INTERVENTION PHYSICAL ACTIVITY QUESTIONNAIRE (II)

Please Answer ALL questions

Section A PERSONAL FACTORS

- A1. Age (in years):
- A2. Gender: Male/Female (circle ONE)

Section B CURRENT PHYSICAL ACTIVITY

- B1. Which statement best describes **your own** current physical activity/exercise patterns (tick ONE only)
1. I am not physically active and I do not intend to start. []
 2. I am not physically active but I am thinking about starting. []
 3. I am physically active once in a while but not regularly. []
 4. I am physically active but just started recently. []
 5. I am regularly physically active and have been for longer than six months. []
 6. I have been regularly physically active in the past but not now. []

If you selected option 6 above, which one of the statements below best describes your current position? (tick one only)

- I do not intend to start being physically active again. []
- I am thinking of starting to be physically active again. []

- B2. Think about the last seven days. How many times on average did you accumulate 30 minutes of the following kinds of activity throughout the day?

Times per week

Vigorous Activity

(heart beats rapidly, breathing hard)
eg. Running, jogging, squash, hard swimming,
cycling, basketball, football, aerobics, etc.

Moderate Activity

(breathing harder than normal and feeling warmer)
eg. Brisk walking, heavy gardening – digging, mowing.

Mild Activity

(minimal effort, very easy)
eg. Yoga, easy walking, light housework/gardening,
bowling.

SECTION C YOUR PLAN

Research shows that you are more likely to achieve your goals if you make a plan in advance of when you are going to do the activity. Please think about the next 12 weeks and **identify the 3 days per week** when you will participate in at least 30 minutes of moderate intensity physical activity, **and please make a commitment to doing so**. When you have made your decision, please complete the table below indicating your chosen activity, the day, when, time and where you will do it.

DAY OF THE WEEK	ACTIVITY (eg. brisk walking, gym session, swimming)	WHEN (eg. after breakfast, before/after lunch, before/after work)	TIME (eg. at 10.30am)	WHERE (eg. in the Downhills Park, at the Tottenham Green leisure centre)
MONDAY				
TUESDAY				
WEDNESDAY				
THURSDAY				
FRIDAY				
SATURDAY				
SUNDAY				

My Action Plan

Physical Activity Session 1

1. On (write the **DAY** you will do the activity) _____ I will (write the **ACTIVITY** you will do) _____, (write **WHEN** you will do the activity) _____ at (write the **TIME** you will do the activity) _____, in (write **WHERE** you will do the activity) _____.

Physical Activity Session 2

2. On (write the **DAY** you will do the activity) _____ I will (write the **ACTIVITY** you will do) _____, (write **WHEN** you will do the activity) _____ at (write the **TIME** you will do the activity) _____, in (write **WHERE** you will do the activity) _____.

Physical Activity Session 3

3. On (write the **DAY** you will do the activity) _____ I will (write the **ACTIVITY** you will do) _____, (write **WHEN** you will do the activity) _____ at (write the **TIME** you will do the activity) _____, in (write **WHERE** you will do the activity) _____.

If I miss my planned Physical Activity Session

If I miss my planned physical activity session I will choose another day to do it. I will decide within **24 hours** of missing my activity **exactly when** I will do my missed session.

If I miss my planned session I agree to do the above.

(Please tick box to confirm your agreement)

Thank you for completing this questionnaire.

For Office Use Only:

Confidence Score

Importance Score

Version No. 1
12/3/07

12 WEEKS PHYSICAL ACTIVITY QUESTIONNAIRE (II)

Please Answer ALL questions

**Section A
PERSONAL FACTORS**

A1. Age (in years):

A2. Gender: Male/Female (circle ONE)

**Section B
CURRENT PHYSICAL ACTIVITY**

B1. Which statement best describes **your own** current physical activity/exercise patterns (tick ONE only)

- 1. I am not physically active and I do not intend to start. []
- 2. I am not physically active but I am thinking about starting. []
- 3. I am physically active once in a while but not regularly. []
- 4. I am physically active but just started recently. []
- 5. I am regularly physically active and have been for longer than six months. []
- 6. I have been regularly physically active in the past but not now. []

If you selected option 6 above, which one of the statements below best describes your current position? (tick one only)

- I do not intend to start being physically active again. []
- I am thinking of starting to be physically active again. []

B2. Think about the last seven days. How many times on average did you accumulate 30 minutes of the following kinds of activity throughout the day?

Times per week

Vigorous Activity
(heart beats rapidly, breathing hard)
eg. Running, jogging, squash, hard swimming, cycling, basketball, football, aerobics, etc.

Moderate Activity
(breathing harder than normal and feeling warmer)
eg. Brisk walking, heavy gardening – digging, mowing.

Mild Activity
(minimal effort, very easy)
eg. Yoga, easy walking, light housework/gardening, bowling.

Questions adapted from Godin and Shephard (1985)

SECTION C
PATIENT SATISFACTION

C1. How useful was the physical activity referral scheme in helping you to become more physically active? (circle one number).

Useless					Neither helpful /unhelpful					Very useful
1	2	3	4	5	6	7	8	9	10	

C2. Can you suggest any improvements to the physical activity referral scheme? Please describe below.

Thank you for completing this questionnaire.

For Office Use Only:

Goal Implemented Yes No

Confidence Score Importance Score

**POST-INTERVENTION (6 MONTH) PHYSICAL ACTIVITY
QUESTIONNAIRE – All groups**

Please Answer ALL questions

**Section A
PERSONAL FACTORS**

- A1. Age (in years):
- A2. Gender: Male/Female (circle ONE)

**Section B
CURRENT PHYSICAL ACTIVITY**

- B1. Which statement best describes **your own** current physical activity/exercise patterns (tick ONE only)
- 1. I am not physically active and I do not intend to start. []
 - 2. I am not physically active but I am thinking about starting. []
 - 3. I am physically active once in a while but not regularly. []
 - 4. I am physically active but just started recently. []
 - 5. I am regularly physically active and have been for longer than six months. []
 - 6. I have been regularly physically active in the past but not now. []

If you selected option 6 above, which one of the statements below best describes your current position? (tick one only)

- I do not intend to start being physically active again. []
- I am thinking of starting to be physically active again. []

- B2. Think about the last seven days. How many times on average did you accumulate 30 minutes of the following kinds of activity throughout the day?

Times per week

Vigorous Activity

(heart beats rapidly, breathing hard)
eg. Running, jogging, squash, hard swimming, cycling, basketball, football, aerobics, etc.

Moderate Activity

(breathing harder than normal and feeling warmer)
eg. Brisk walking, heavy gardening – digging, mowing.

Mild Activity

(minimal effort, very easy)
eg. Yoga, easy walking, light housework/gardening, bowling.

Questions adapted from Godin and Shephard (1985)

Thank you for completing this questionnaire. Please return it using the enclosed stamped addressed envelope.

Appendix B9 – Means, standard deviations & Missing Value analysis

Missing Value Analysis

Univariate Statistic

	N		Std. Deviation	Missing		No. of Extremes(a,b)	
	Count	Percent		Count	Percent	Low	High
Baseline soc	52	2.63	1.048	1	1.9	0	6
Baseline Confidence	44	7.43	2.327	9	17.0	0	0
Baseline Importance	44	8.64	1.942	9	17.0	6	0
Baseline Weight	50	98.98	20.764	3	5.7	0	1
Baseline Step	34	3866.53	2634.085	19	35.8	0	0
3 mth soc	53	3.96	.733	0	.0	.	.
3 mth Confidence	47	9.04	1.062	6	11.3	1	0
3 mth Importance	47	9.55	.686	6	11.3	0	0
3 mth Weight	37	98.46	18.286	16	30.2	0	1
3 mth Step	26	4775.73	3007.639	27	50.9	0	1
6 mth soc	39	3.54	1.274	14	26.4	0	0
Baseline energy expenditure	49	543.98	337.511	4	7.5	0	5
3 mth energy expenditure	52	949.90	567.415	1	1.9	0	1
6 mth energy expenditure	32	791.25	496.691	21	39.6	0	1

a Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).

b . indicates that the inter-quartile range (IQR) is zero.

Summary of Estimated Means

	All Values	EM
Baseline SOC	2.63	2.63
Baseline Confidence	7.43	7.40
Baseline Importance	8.64	8.68
Baseline Weight	98.98	97.97
Baseline Step Count	3866.53	3404.54
3 month SOC	3.96	3.96
3 mth Confidence	9.04	9.07
3 month Importance	9.55	9.55
3 month Weight	98.46	96.61
3 month Step	4775.73	4662.40
6 mth SOC	3.54	3.64
Baseline energy expenditure	543.98	545.06
3 mth energy expenditure	949.90	946.95
6 mth energy expenditure	791.25	733.64

Summary of Estimated Standard Deviations

	All Values	EM
Baseline soc	1.048	1.046
Baseline Confidence	2.327	2.437
Baseline Importance	1.942	1.949
Baseline Weight	20.764	21.133
Baseline Step count	2634.085	2791.763
3 mth soc	.733	.733
3 mth Confidence	1.062	1.056
3 mth Importance	.686	.699
3 mth Weight	18.286	19.313
PostStep	3007.639	2813.324
6 mth soc	1.274	1.268
Baseline energy expenditure	337.511	333.560
3 mth energy expenditure	567.415	565.545
6 mth energy expenditure	496.691	557.410

EM Means(a,b)

Baseline soc	2.63
Baseline Confidence	7.40
Baseline Importance	8.68
Baseline Weight	97.97
Baseline Step count	3404.54
3 mth soc	3.96
3 mth Confidence	9.07
3 mth Importance	9.55
3 mth Weight	96.61
3 mth Step count	4662.40
6 mth soc	3.64
Baseline energy expenditure	545.06
3 mth energy expenditure	946.95
6 mth energy expenditure	733.64

a Little's MCAR test: Chi-Square = 299.239, DF = 292, Sig. = .373

b The EM algorithm failed to converge in 25 iterations.

Stage of Change Means and Standard Deviations

Group		Baseline SOC	3 Month SOC	6 Month SOC
Control	Mean	2.44	3.78	3.49
	N	18	18	18
	Std. Deviation	1.042	.878	1.030
II	Mean	2.88	4.25	3.66
	N	16	16	16
	Std. Deviation	1.204	.577	1.047
MI	Mean	2.61	3.89	3.77
	N	19	19	19
	Std. Deviation	.891	.658	1.344
Total	Mean	2.63	3.96	3.64
	N	53	53	53
	Std. Deviation	1.038	.733	1.141

Kruskal-Wallis Test - Stage of Change

GroupNum		N	Mean Rank
Pre Stage of Change	Control	18	23.92
	II	16	29.59
	MI	19	27.74
	Total	53	
3 Month Stage of Change	Control	18	24.44
	II	16	32.41
	MI	19	24.87
	Total	53	
6 Month Stage of Change	Control	18	24.58
	II	16	26.63
	MI	19	29.61
	Total	53	

Test Statistics(a,b)

	Baseline SOC	3 Month SOC	6 Month SOC
Chi-Square	1.570	3.768	1.019
df	2	2	2
Asymp. Sig.	.456	.152	.601

a Kruskal Wallis Test

b Grouping Variable: Groups

Participants Meeting Study Aims

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Group * Baseline	49	92.5%	4	7.5%	53	100.0%
Group * 3 Months	52	98.1%	1	1.9%	53	100.0%
Group * 6 Months	33	62.3%	20	37.7%	53	100.0%

Crosstab – Participants meeting study aims at baseline

Count

	Pre-meet		Total
	0	1	0
Group A	10	5	15
B	8	8	16
C	16	2	18
Total	34	15	49

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.106(a)	2	.047
Likelihood Ratio	6.530	2	.038
N of Valid Cases	49		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 4.59.

Crosstab – Participants meeting study aims at three months

Count

	Post-meet		Total
	No	Yes	No
Group A	5	12	17
B	3	13	16
C	4	15	19
Total	12	40	52

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.597(a)	2	.742
Likelihood Ratio	.585	2	.746
N of Valid Cases	52		

a 3 cells (50.0%) have expected count less than 5. The minimum expected count is 3.69.

Crosstab – Participants meeting study aims at 6 months

Count

		6M-meet		Total
		No	Yes	No
Group	A	1	7	8
	B	2	9	11
	C	6	8	14
Total		9	24	33

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.053(a)	2	.217
Likelihood Ratio	3.092	2	.213
N of Valid Cases	33		

a 3 cells (50.0%) have expected count less than 5. The minimum expected count is 2.18.

APPENDIX B10 – Motivational Interviewing prompt sheet

MOTIVATIONAL INTERVIEWING PROMPT SHEET

MI 'Spirit': Collaboration, Listen more & tell less, decision to change lies with the patient
MI Principles: Express Empathy, Develop Discrepancy, Roll with Resistance, Support self-efficacy

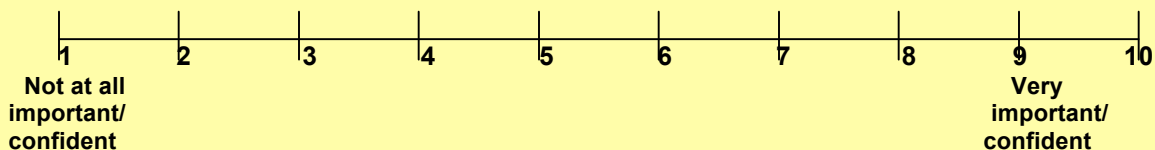
Openers

- “We have X time together today and we have a few topics we could discuss, eg. your physical activity, your medications, your diet, monitoring your blood sugar.....”
- “We have X time together today and I’m interested in finding out about your current level of physical activity”
- “I am also interested to hear about.....”
- “What concerns you about your current level of activity?”
- *Typical Day Strategy:* “Can you talk me through a typical day with reference to physical activity?”

Importance/Confidence Ruler

“On a scale of 1-10, how important is it to you to become more physically active?
What number would you give yourself?”

“On a scale of 1-10, how confident are you that you could become more physically active if you wanted to. What number would you give yourself?”



What makes it that important/what makes you that confident?
Why are you at a X and not at a Y (lower number?)

What would it take to raise your score to Z?
How can I help you to get there?

Useful Questions/Strategies for exploring Importance (Use OARS)

- Importance Ruler
- Good things & not so good things about staying the same/changing. Develop discrepancy between where patient is now with regards to their activity level and where they want to be.
- “What concerns you most about your current level of activity?”
- Looking Back (before problem developed/early development)
- Looking forward (if change is made/if no change), eg. “Let’s imagine for a moment that you did manage to increase your activity level. How would you feel?”
- Query Extremes – “What are the worst things that might happen if you don’t x.....?”

Useful Questions/Strategies for exploring Confidence (Use OARS)

- Confidence Ruler
- Brainstorming: “I can tell you what’s worked for others”, “Let’s go through some options together”.
- Past efforts, successes and failures: “What’s been your most successful attempt to-date?”
- Draw out and reflect confidence
- If appropriate, elicit commitment to change

If 'ready' Negotiate a change plan

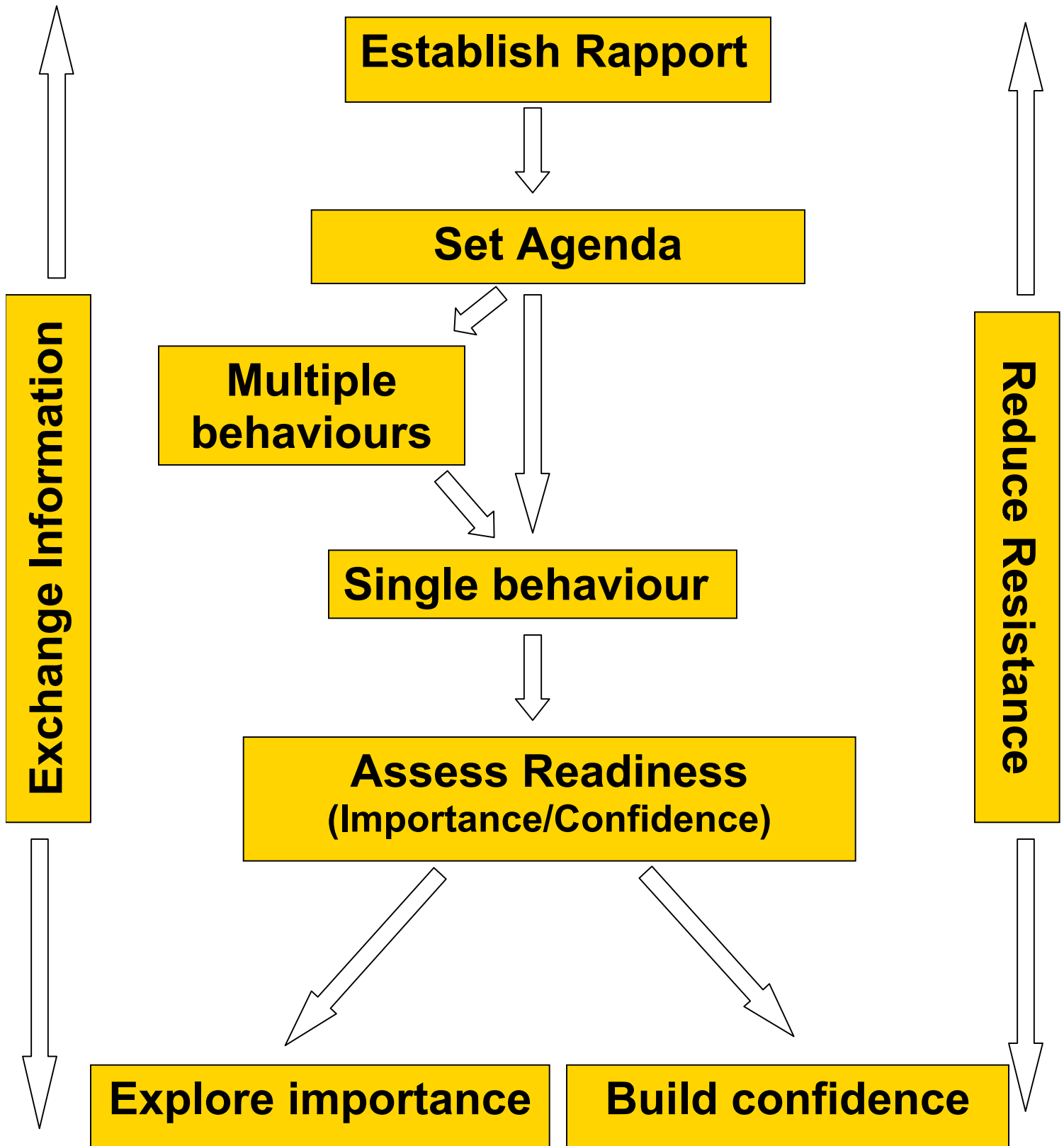
Closing the Brief Intervention:

- Do you have any questions?
- Summarise the consultation, highlight change/commitment talk, ambivalence
- What stood out most for you?
- Thank patient for coming and for sharing information and/or considering new choices/possibilities

(Designed by Vanessa Bogle - References: Miller & Rollnick 1992; Rollnick, Mason & Butler, 1999)

Consultation – Key Tasks

Error!



Section C: Professional Practice

Case Studies

Core Unit 4 – Case Study

Teaching and Training

2-Day Motivational Interviewing Training Programme

Background

My current role involves delivering health promotion/development training. In August 2005 I attended a 3-day training course to become a trainer in Motivational interviewing (MI). The training was run through the Centre of Motivation and Change in the Netherlands and was delivered by Karen Ingersoll and Jeff Allison in addition to the founders of MI, namely William Miller and Steve Rollnick. MI is a facilitative method of communication designed to evoke natural change and is defined as a “client-centred, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence”¹.

I will describe how I planned, designed and delivered a 2-day MI training course, with a co-trainer, and my experience of doing so.

Context

The MI training was designed to provide the opportunity for staff working within counselling or advisory roles to enhance their communication skills and

¹ Miller, W. R. and Rollnick, S. (2002). *Motivational Interviewing. Preparing people for change* (2nd edition). Guildford Press. New York.

learn a new approach in facilitating health behaviour change. The training took place in February 2007 at Haringey Teaching Primary Care Trust (HTPCT).

Plan and design training programmes

Assess Training Needs

A formal needs assessment was not carried out as the Head of Nutrition and Dietetics had previously identified a gap in knowledge in the area of health behavior change for dietitians/nutritionists, and I had previously trained 26 other members of their team in December 2006. This training was run specifically to train the few dietitians/nutritionists who missed the previous training and to train some leisure centre staff that had no previous experience in this area, who would be involved in the delivery of a health intervention in partnership with Haringey Teaching Primary Care Trust.

Seven participants attended the training programme: 2 dietitians, 1 nutritionist, 3 exercise practitioners and 1 physical activity health promotion specialist who only attended Day One due to a work emergency arising. A mini needs assessment was conducted during the first session of the training. This was in the form of asking participants whether they had any prior training in MI or other behaviour change approaches. One participant had received Cognitive Behavioural Therapy training some 10 years previously.

To gain an insight into the needs of the participants I designed the opening exercise to encourage them to reflect upon their past experiences of helping people to change, particularly on occasions when they were faced with counseling challenges, and those occasions which gave them most satisfaction or enjoyment. This exercise also served as a self-assessment of the participants' own learning needs. From this exercise, participants were

asked what they would like to gain from the 2-day training, which was then written up as their 'Wish List'.

The aim of this exercise was to allow the participants to form their own learning contract, which is suggested as a useful way of encouraging them to take ownership of the training and of their personal learning outcomes². In addition, participants were asked to rate themselves on their perception of their confidence in their ability to help people to change their behaviour using a 1-10 confidence scale. I obtained some very useful information that served as a good starting point for me. Participants were also asked to rate themselves immediately after the training and to provide a rationale behind their self-ratings. This was the first time that I had used the self-rating scale as part of the evaluation process, and I had not planned to ask participants to provide a rationale, but felt on the day that this was necessary, especially if the rating remained the same following the training.

Programme structure and content

It was important to plan the training carefully. However, although I planned well, I held the plan lightly to allow flexibility in the programme based on the needs of the participants. In my planning I was mindful of the exercises chosen, for example, their complexity, energy and timing in addition to being aware of the importance of projecting specific instructions for exercises to ensure that their aims and objectives were met.

The main components of the training were listening skills, ambivalence, readiness to change, dealing with resistance, and exchanging/giving information.

² Race, P. and Smith, B. (1996). *500 Tips for Trainers*. Gulf Publishing Company. Houston.

Training approaches and methods

The training was delivered within the 'spirit' of MI¹, which can be understood as having 3 components, namely collaboration, evocation and autonomy. Applied to my delivery style, I avoided the 'expert trap', worked in partnership with the participants in a democratic way, listened more than I told, and I was respectful of the fact that it was up to the participant whether or not he/she decided to accept MI as an alternative framework. I believe that my training style was consistent with the learner-centred model³. Using this model, the trainer acts as a facilitator of learning, which involves valuing the experiences the participants bring to the training and working in a collaborative way alongside them.

The training was delivered using a variety of interactive and didactic methods to cater for a range of learning styles. This included small group exercises (including role plays), facilitator role play demonstrations, brief video footage of MI consistent and MI inconsistent interactions, group discussions and brief presentations. It was designed and structured to make it as interactive as possible and to provide the participants with as much time as possible to practice, as it is suggested that adopting the 'learning by doing' approach is more effective than participants just listening². I also ensured that there was adequate time for silent reflection following, for example, a de-brief session, role play or group exercise.

³ Exley, K. and Dennick, R. (2004). *Small Group Teaching. Tutorials, seminars and beyond*. Routledge Falmer. London

Materials Used

Flipchart paper	Blu-Tack	Pens
Flipchart Pens	Laptop & projector	Video footage
Handouts	Decisional balance sheet	Confidence
Ruler		

Delivery of training programme

General

To-date I have delivered six 2-day MI training programmes within my current employment and felt fairly confident about delivering the training. I had some initial concerns regarding the size of the group, particularly concerning group dynamics. Typically my training groups are between approximately 15 and 25 participants. However, I felt that training a small group may have its advantages, for example, having more time for more in-depth discussion and time to practice skills, which proved to be the case. At times, when running the group exercises, not all participants were fully engaged. To manage this, I had to listen carefully for the sound of energy levels dropping, as this is a good indicator that people have potentially run out of things to say. It was also sometimes necessary to revise the timings of the exercises given the small numbers.

Training challenges

One of the challenges I was faced with for the first time was having two participants on the training for which English was their second language. At the start of the training I struggled with keeping a balance between simplifying information and going over aspects for them, whilst trying not to lose the other participants in the process. Without singling them out, I overcame this issue by avoiding the use of jargon, simplifying terms and periodically reinforcing the message that questions and comments on material presented were

invited throughout the training which I hoped would then encourage them to do so. Over the two days I also learned to identify participants who appeared to be struggling with certain aspects of the training from their body language and facial expressions. When these instances arose I would attempt to present the material in a different way, for example, using live examples and providing demonstrations using role play. As a facilitator it was rewarding when after successfully presenting the material differently the participant was able to understand it.

A situation arose which I had to deal with carefully. The training was based on a mental health site and as it was a particularly hot day it was necessary to open the windows for ventilation. Sounds of a disturbed patient could be heard, but the group was not keen not to close the windows. However, I noticed that this was upsetting one of participants and as a result I had to make the decision for the window to be closed and arranged for some fans to keep the room at a comfortable temperature. At an appropriate point during the next break I spoke with the participant who advised me that the reason for her upset was that her partner had recently started to experience mental health problems. I explained to her that parts of the hospital were for in-patients with severe mental illness. In addition, I confirmed that she was happy to continue with the training.

Addressing disabilities

One participant had a physical disability, which sometimes made stair climbing difficult, especially after sitting still for long periods of time. As the training room was situated on the first floor, this was problematic. As I had not screened for disabilities on the registration form I was not aware of the needs of the participant until she arrived, and even then was not fully informed of her needs which became more apparent as the training progressed. I attempted to address this by moving the training to the ground floor, but unfortunately the training room was unavailable.

Timings of breaks were negotiated with the participants, with the consensus being that they have breaks shorter than timetabled. However, I believe that

although the participant with the physical disability agreed with this, she may have done so to avoid being singled out from the group. As a consequence of this, she had to ask other participants to get her refreshments from the cafeteria for her, which was situated in another building, as refreshments were not provided by HTPCT. I feel that this resulted in her missing the opportunity of getting to know other participants, as she was often not able to join them at break times.

It is clear that the above arrangements were unsatisfactory for the participant and that her needs were not fully met. To ensure that I am meeting the individual needs of all participants, in future, I will add questions to the training registration form that will enable me to screen for special needs.

Building self-efficacy

Some participants were anxious about their proficiency in using some of the new techniques and strategies. To build the self-efficacy of participants following a particularly challenging exercise or role play I felt that it was important to highlight the fact that the training should be viewed as a learning process rather than as an event. I also stressed that they were not expected to be 'experts' in MI after just 2 days, using an analogy from my MI Training the Trainers course, namely 'What tune can you be expected to play on a piano after a day!'.⁴

Assessing learning outcomes

A training strategy I used which I felt was particularly useful was in assessing the groups understanding of the various MI concepts and whether I had met the learning objectives at various points throughout the training. To do this, I asked the participants what the top 3 things they had learned and asked them to feed this back. This was an easy way to gauge where the group was in terms of their learning.

⁴ Motivational Interviewing Training the Trainers Course. (August 2005). Centre for Motivation and Change. The Netherlands.

Managing questions

As the training typically generates many questions, I used a further strategy to manage this. A large piece of flipchart paper was positioned on the wall in a prominent position, known as the 'Parking Lot'. The aim is to 'park' questions there that for whatever reason cannot be answered immediately which ensures they are not forgotten. This also demonstrates that all questions are of equal importance. They are then addressed at appropriate points throughout the training. The strategy proved successful on this occasion. Only one question was 'parked' which was addressed at the end of the training, and was related to the use of MI in groups, currently an under-researched area. Participants were given a brief overview of what is known on this topic and were made aware that a book on the use of MI in groups is currently being written to be published in 2008.

In addition, when observing the role plays and other exercises, positive reinforcements were given before offering suggestions on how they might further improve their skills. I felt it was important to do this to avoid my suggestions being taken as a criticism.

Planning and implementation of assessment procedures

The training was evaluated informally using a brief evaluation questionnaire for which a 15 minute time slot was allocated. The evaluation planning started with a careful analysis of the training objectives. It served to evaluate the training on three levels, namely, enjoyment, personal learning and applied learning⁵. A post-training self-perception rating of participants' confidence to help people to change their behaviour also formed part of the evaluation.

⁵ Rogers, J. (2002). *Adults Learning (4th Edition)*. University Press. Buckingham.

Evaluate such training programmes

The 2-day MI training was evaluated positively using the evaluation questionnaire, self-confidence ratings and the 'Wish List' (see appendix C1).

Conclusion

Having reflected upon my practice, I will make some changes to improve future training:-

- Carry out a more thorough needs assessment to screen for language and disabilities.
- Consider not running groups with less than 10 participants because of the possible negative effects on group dynamics.
- Add the confidence self-rating scale to the evaluation form and a section to record the rationale behind the pre and post training ratings.

I enjoy delivering training in the area of health behaviour change which adds variety to my work. Health behaviour change training is an area I would like to focus on more in the future. In general I was very pleased with the training and feel that the content and structure were appropriate and thus achieved the learning outcomes.

APPENDIX C1 – MI Training Evaluation Results

MI Training – February 2007

EVALUATION RESULTS

	Excellent	Good	Not Good	Poor
Course relevance	3	3	0	0
Quality of handouts	2	4	0	0
Course atmosphere	3	3	0	0
Increased confidence following training	1	5	0	0
Usefulness of training	2	4	0	0
Accommodation	1	4	0	1

Comments on presentation style of trainers

- Very patient and knowledgeable.
- Very approachable and dealt with all issues raised.
- Very pleasant.
- User friendly and interactive.
- Good structure and subject presentation.
- Very relaxing and ready to listen.

Key points learned

- The different tools available to meet your clients needs
- Listen and don't ask questions.
- The importance of listening and how to deal with resistance.
- To leave more time to the client explaining reasons.
- MI is about being client-centred allowing the client to prioritise the solution themselves.
- Reflective questioning, the righting reflex and affirmations.

Least beneficial aspect of the course

- The theory was important but I found myself drifting as I wasn't used to being lectured for a whole morning.
- Difficult to role play with another participant with poor English.

Most beneficial aspects of the course

- Role play (x2) in reflective listening - putting yourself in the client's shoes
- All aspects of the course (x2)
- The new way to approach people on one-to-one sessions.
- Listen and don't ask questions.
- Effects of some of the feelings clients may encounter during the role plays we did.

Areas not fully covered

NONE

Aspects you would like to be included in the course

- More time.
- No – Everything covered to an appropriate degree.
- A few more workshops that make you more around.

Changes you would like made to the course

- As registered disabled person: room hard to access, require longer breaks to get to the toilets/canteen.
- Room too hot.
- 3-day training to enable a better understanding.
- Overheads to follow in the same order as the lectures.

Confidence self- ratings

- 4 out of 6 confidence self-ratings improved following the 2-day training course.
- 2 self-ratings remained the same. The rationale given were as follows:-
 - (a) I always felt confident but have learned some interesting tools to use – I can't evaluate until I have practiced it.
 - (b) The course has shown me other methods rather than increased my overall ability.

Wish List

- At the end of the training the participants fed back that the training had covered/achieved their Wish List.

Core Unit 4 – Case Study Teaching and Training

***Physical Activity Promotion Workshop* Work-based Physical Activity Initiative**

Background

I am responsible for leading and implementing the Health at Work aspect of the Department of Health Choosing Health agenda within my role of Public Health Strategist (Long-Term Conditions) for Haringey Teaching Primary Care Trust (HTPCT)

In December 2006 I directed the development of a 5-day physical activity campaign for HTPCT staff. The aim was to raise awareness of the benefits of physical activity amongst staff and to promote opportunities to be physically active before, during and after work. Staff were invited to attend a range of introductory physical activity sessions and to loan a device to measure activity levels. Staff needing more support in becoming more active had the opportunity to attend an individual 20-minute client-centred physical activity consultation using a Motivational Interviewing (MI) approach⁶.

The campaign was evaluated positively, with the staff consensus being that this event should run annually. In addition, the work-based physical activity programme was further developed in response to staff needs.

⁶ Miller, W. R. and Rollnick, S. (2002). *Motivational Interviewing. Preparing people for change* (2nd edition). Guildford Press. New York.

The second campaign took place on 4th-8th June 2007 and was extended to include staff employed by the Haringey Mental Health Trust who share the site. Due to the financial situation of HTPCT, the campaign received minimal funding requiring me to modify the programme. I decided to pilot a group physical activity promotion session for staff rather than run the individual consultations as in 2006. The main aim of the session was to raise awareness of the benefits of physical activity. Secondary aims were to provide an opportunity for questions related to physical activity to be addressed, and where appropriate, to assist staff in making change and in developing a change plan.

I will describe how I planned, designed and delivered the one-hour workshop, and my experience of doing so.

Plan and design training programmes

Assessment of participants' needs

Eight members of staff attended the physical activity promotion workshop. Prior to the delivery of the workshop a needs assessment was not carried out as having evaluated the 2006 campaign, staff had expressed interest in attending a session to learn more about the benefits of physical activity. However, at the start of the workshop I conducted an assessment of the participants' readiness/motivation to increase their level of physical activity. This involved asking participants to rate themselves using a simple numerical 10-point scale on the importance of change and the degree of confidence that they could make change if they decided to do so, with a score of one representing 'not confident/important' and ten being 'extremely confident/important'. This enabled me to identify those low in confidence and for whom change was relatively unimportant. I then attempted to facilitate their readiness/motivation to change through helping to build confidence and/or finding out what the personal value of change was for participants through exploring importance to change.

This assessment was conducted following the delivery of the physical activity presentation and repeated at the end, in order to assess whether the participants' scores had altered.

Programme structure and content

The workshop consisted of five main sections, namely the benefits of physical activity, an exploration of the good and not so good things about being active, an exploration of the participants' perception of their confidence to become more active and of how important being physically active was for them and goal setting (see Appendix C2 – workshop outline).

Training approaches and methods

The style in which I delivered the workshop was that of a democratic facilitator, as described by Exley et al⁷, working in partnership with the participants to set objectives and activities, and intervening in the process only for the purpose of guiding the participants and assisting them in keeping them focused on the discussion or task at hand.

The first section of the workshop consisted of a 10-minute presentation outlining the benefits of leading a physically activity lifestyle and the current recommendations. To avoid a one-sided approach where my agenda would be the focus, I delivered the section using a combination of both a didactic and interactive teaching methods. This two-sided approach aimed to encourage debate and discussion amongst the participants, to share their

⁷ Exley, K. and Dennick, R. (2004). *Small Group Teaching. Tutorials, seminars and beyond*. Routledge Falmer. London

existing knowledge and to allow them to express their informational needs. This was achieved through initially asking the participants fairly simple, closed knowledge recall questions on the subject of physical activity, leading on to more open questions.

The training was delivered within a range of theoretical frameworks, including:-

Transtheoretical Model: Assessing participants' stage of change with regards to physical activity and discussing relapse as part of the change process.

The Health Belief Model: In delivering the presentation - perceived susceptibility/severity of disease associated with inactivity, perceived benefits of being active and barriers to becoming more active (Rosenstock, 1966).

Motivational Interviewing: Exploring readiness to become more active (importance/confidence dimensions), exploring ambivalence about change and in the overall delivery of the session using a client-centred approach (Miller & Rollnick, 2002).

Implementation Intentions: Assisting in developing specific physical activity goals. Strategies used were consistent with the forming of implementation intentions Gollwitzer, Orbell & Sheeran, 2002).

Bandura's Self-efficacy Theory: Assisting in building self-efficacy beliefs of participants that increasing physical activity levels was possible (Bandura, 1977).

Materials Used

Flipchart paper	Blue tack
Flipchart Pens	Handouts
Confidence Ruler	Laptop & projector
Importance Ruler	Physical Activity Leaflets

Delivery of the workshop

General

Over the years and in varying roles I have delivered many workshops and training sessions on the subject of physical activity. They have largely been aimed at health care professionals to assist them in promoting physical activity with their patients, so delivering this workshop was a new experience for me. I found planning this session challenging, as although I have used the MI approach on a one-to-one basis, this was the first time I had experienced using it within the group setting. In addition, on preparing for the session and having searched the MI group literature, information in this area was sparse and there was no clear consensus on its application¹.

Training challenges – Workshop pace

The session was run during the staff lunchtime. The main challenge I faced was to deliver the session within the one-hour time slot. Although I managed to deliver the session within the hour, upon reflection I feel that I was over optimistic with the regards to the amount of material I could cover effectively. This resulted in me consciously speeding up the delivery approximately half way through the session in an attempt to ensure that I covered all the material.

What worked well

Incorporating the confidence and importance rulers into the training worked well and generated lots of discussion. For example, one participant voiced that she did not enjoy any form of physical activity although she felt that being active was important in maintaining positive health. In addition, on assessing her readiness/motivation to change, her confidence was low. From this assessment I was able to ask a range of open-ended questions to explore her ambivalence towards change. She identified lack of time as a major barrier to becoming more active. Following the first session covering the recommendations for physical activity, it was apparent that she participant had little understanding of levels of activity necessary to confer health benefits. The rest of the participants then shared strategies they had used in the past to increase their activity levels or gave ideas as to how she might incorporate activity into her day to address the issue of lack of time. For much of this discussion I stood back in order to encourage debate amongst the participants.

Assessing learning outcomes

Several participants have reported increases in their level of activity, which they report to having arisen as a direct result of attending the workshop. For example, the participant mentioned above reports walking with colleagues regularly at lunchtime and attending at a group work-based physical activity session. Two other participants who were considering change, identifying lack of time as a major barrier but also viewing physical activity as highly important for health, reported being in the action stage of change. Having received information on the recommendations for physical activity, they report to have incorporated walking into their lifestyle in the form of active travel, ie. walking part way to and from work. A further participant fed back that the session confirmed he was currently meeting the recommended guidelines for physical activity, which he was unsure about prior to attending the session.

Planning and implementation of assessment procedures

The workshop was not evaluated formally. Instead I made an assessment of the readiness/motivation of the participants to increase their level of physical activity through examining two dimensions, namely importance and confidence towards the start and at the end of the workshop to determine whether there had been an overall shift towards the direction of change. Upon reflection, if I were to repeat this workshop again, I would also build in a brief evaluation questionnaire to assess learning outcomes in terms of knowledge about the benefits and recommendations for physical activity and to capture aspects of the session where improvements could be made/aspects the participants perceived went well.

Evaluate such training programmes

The final assessment of the participants' readiness/motivation using the importance and confidence rulers highlighted a definite increase in importance ratings for physical activity and a more subtle increase in confidence ratings, suggesting an overall shift in the direction towards change (see Appendix C3).

As aforementioned, I feel that I slightly rushed the delivery of the workshop towards the end and did not build in enough time for the section aimed at building self-efficacy beliefs. I believe that this was picked up from the post-workshop participant self-ratings of confidence to change.

Conclusion

In summary, I found the delivery of the workshop challenging in that I was using MI for the first time within the group setting, but also rewarding in that I felt it stretched my abilities. I believe the aims and objectives were met and that overall the workshop was well received by the participants.

In addition, having reflected upon the delivery of the workshop, I would make the following changes to improve it in the future:-

- Develop a more in-depth evaluation.
- Revise the timings of the workshop plan to allow more time for building confidence.
- Conduct a more thorough literature search, outside the area of MI, in using evidence-based approaches to behaviour change in groups.

APPENDIX C2 – Group Physical Activity Workshop Outline

Group Physical Activity Promotion Workshop

Vanessa Bogle

4th June 2007

Session Aims

- To increase knowledge and awareness of the benefits and recommendations for physical activity.
- To provide an opportunity for questions related to physical activity to be addressed.
- To assist staff in developing a change plan.

Session Objectives

- Participants are knowledgeable about the health benefits and recommendations for physical activity.
- Participants are more confident in their ability to become more physically active.

Programme Outline

Content	Time Allocated
Presentation - Why be active? and discussion	15 minutes
Good and not so good things about being active	10 minutes
Physical activity and you (Part I) (exploring confidence and importance)	10 minutes
Physical activity and you (Part II) (building confidence)	15 minutes
Discussion and questions	10 minutes
TOTAL	1 hour

Appendix C3 - Evaluation of participant's readiness/ motivation

Evaluation: Exploration of participants' readiness/motivation regarding Physical Activity using self-rating Confidence and Importance Rulers

This strategy involves asking a set of scaling questions with the aim of understanding the participants' social world with reference to physical activity and to encourage them to explore their personal values about change and the importance of it.

'Importance' self- ratings

Pre

Two Participants:	Level 2 rating
Two Participants	Level 4 rating
One Participant	Level 5 rating
One Participant	Level 8 rating
Two Participants	Level 10 rating

Post

Two Participants	Level 5 rating
Three Participants	Level 8 rating
Two participants	Level 10 rating

'Confidence' self- ratings

Pre

One Participant	Level 1 rating
Three Participants	Level 4 rating
Three Participants	Level 7 rating
One Participant	Level 8 rating

Post

One Participant	Level 1 rating
Two Participants	Level 3 rating
Two participants	Level 7 rating
One Participant	Level 9 rating
One Participant	Level 10 rating

The evaluation revealed a definite increase in importance ratings for physical activity and a more subtle increase in confidence ratings, suggesting an overall shift in the direction towards change.

Core Unit 3 – Case Study

Consultancy

Health Behaviour Change and Physical Activity Promotion Training for Department of Health (DH) pilot Physical Activity Care Pathway

Setting:	Primary Care
Client:	The Department of Health
Target Group:	Primary health care professionals participating in the Department of Health Physical Activity Care Pathway pilot project

Aims of Consultancy:

- To provide a consultancy service for a pilot project to assess the feasibility of implementing a care pathway on physical activity in primary care.
- To deliver Motivational Interviewing and physical activity promotion training for health care professionals.

Introduction

I will describe my experience of being brought in as an external consultant by the DH for a short timeframe to deliver the specific task of training primary health care professionals in physical activity promotion and Motivational Interviewing to assist them in addressing the issue of inactivity within the

primary care setting. The consultancy was performed under my company name, Innovative Health Consultancy.

Background

In December 2006 it was brought to my attention by the Physical Activity and Health Co-ordinator for North Central London (working on behalf of Sport England and NHS London) that a draft primary care Physical Activity Care Pathway was being developed. The concept of the care pathway was to raise the profile of physical activity within the primary care setting and to embed the process of monitoring the physical activity status of patients into NHS care systems and within patient records. A further aim of the pathway was to develop a strategic framework for health care practitioners for the provision of one-to-one support for patients to help them become more physically active. The London-based Physical Activity and Health Co-ordinators had recently presented the care pathway to the DH policy leads who expressed interest in the concept of the care pathway, and in piloting it in 2007 in eight London general practices across five Primary Care Trusts.

An informal consultation of the care pathway model was then conducted locally. It was circulated to leads with a physical activity remit working within London Primary Care Trusts for their comments.

Reflection

I was extremely keen to be involved in this pilot project, as one of my key work objectives is to raise the profile of physical activity within Haringey. One of my specific aims, and an area of particular interest to me, is to promote physical activity within the primary care setting, as the evidence suggests that

it is not being promoted alongside other health enhancing behaviours such as smoking cessation and healthy eating.⁸

In March 2007 PCTs interested in becoming pilot sites for the physical activity care pathway pilot were asked to submit an expression of interest. After discussions with a practice that were particularly proactive in the area of physical activity promotion, I submitted an application for Haringey and was informed it was successful at the end of April. I saw the pilot as a means of assisting me to meet the above-mentioned work objectives. In addition, I felt it would be an exciting opportunity for me to influence the development of the care pathway from a health psychology perspective, as what struck me upon first seeing the draft of the care pathway was that it was not grounded in psychological theory.

Assessing requests for consultancy

Within my capacity as Public Health Strategist for long-term conditions at Haringey Teaching Primary Care Trust (HTPCT) and lead for physical activity, I was invited to attend a meeting at the DH Headquarters for input into a discussion around the further development of the draft Physical Activity Care pathway. During this meeting, upon the request of the North London Physical Activity Health Co-ordinator, I informally presented to the DH Team some of the work I had developed within the areas of physical activity and Motivational Interviewing within Haringey TPCT, and previously within my employment at Wandsworth PCT.

Motivational Interviewing is an evidence-based style of counseling, which is both client-centred and directive, used across a range of health behaviours including physical inactivity, smoking, diet and alcohol misuse to help motivate

⁸ Iliffe, S and Mitchley, S. (1994). *Promotion of healthy exercise in general practice: A snapshot*. Medical Science Research. 22:445(6)

people to resolve ambivalence about their health care behaviours and take positive action⁹. The DH's interest in Motivational Interviewing stemmed from the findings of the recent National Institute for Health and Clinical (NICE) review of methods to increase physical activity (2006)¹⁰. Within this review, NICE examined the effectiveness of brief interventions in primary care to increase physical activity levels in adults. NICE concluded that the use of brief interventions could achieve short, long, or very long term effects. In addition, the DH Team felt that the Motivational Interviewing approach would help meet the "Choosing Health: Making Healthier Choices Easier" White Paper agenda, to equip front-line staff to recognise the opportunities for health promotion and improvement, and use skills in health psychology to help people change their lifestyles¹¹.

At this stage I was acting as an 'internal' helper, consistent with the 'Process Model' of consultancy. This model is characterised by being both collaborative and client-centred. As proposed by Schein, the consultant adopts a helping role in guiding the client through a process of discovery in which the client can identify problems or concerns within an organisation, in order for the client to ultimately make key decisions in resolving the identified problems or concerns¹². Within this 'helping' role, I worked in collaboration with the DH Team and their partners, namely the London Physical Activity and Health Co-ordinators and PCTs, in developing a Physical Activity Care Pathway that was evidence-based and informed by health psychology theory. The advice I gave on Motivational Interviewing was based on evidence that patient-centred approaches to health care consultations may have better

⁹ Miller, W.R. and Rollnick, S. (2002). *Motivational Interviewing. Preparing people to change*. Guildford Press. USA.

¹⁰ National Institute for Health and Clinical Excellence (2006). *Four commonly used methods to increase physical activity: Brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling*. Public Health Intervention Guidance No.2.

¹¹ Department of Health (2004). *Choosing Health: Making Healthier Choices Easier*. Department of Health.

¹² Schein, E.H. (1999). *Process consultation revisited. Building the helping relationship*. Addison-Wesley.

outcomes than traditional advice giving, especially when lifestyle change is involved.

In addition, the DH were aware of my input into the development of an adult obesity care pathway and resource pack, having given specific input from a health psychology perspective. They also knew that I had been brought in as an external consultant by the NCL sector to deliver Motivational Interviewing training for a range of health care professionals within Enfield and Barnet to support the rollout of the Obesity Care Pathway.

During mid-March I was formally invited to sit on draft Physical Activity Care Pathway steering group within the capacity of Public Health Strategist for Long Term Conditions for Haringey TPCT. Other members of the steering group included DH representatives, the London Physical Activity and Health Co-ordinators, GP, practice nurse and PCT representatives. During the initial meetings that took place between January and March 2007, my main input was into the recruitment aspect of the care pathway, in terms of assessing readiness to change, the brief intervention design and the maintenance and relapse aspects of it from a health psychology standpoint. This was to ensure that the complexities associated with health behaviour change were not overlooked or oversimplified. In addition, I introduced them to strategies to help facilitate health behaviour change, such as implementation intentions. I was also asked to give my thoughts regarding the training needs of the health care professionals who would be piloting the care pathway to enable them to deliver the brief interventions. I also had input into the development of a resource pack for patients, with particular input into the 'making the change' and 'my activity goals' sections.

Much of the advice and information given was drawn from my experience of training and from leading on the area of physical activity and obesity within my current role. I also drew upon my previous experience of leading on a three-

year British Heart Foundation funded action research project to assess the feasibility of physical activity clinics in primary care. The approach used was Motivational Interviewing, to increase the uptake of physical activity in patients with established coronary heart disease and type II diabetes, which was found to be effective.

Following the above-mentioned meetings and numerous requests from the DH Team and Physical Activity Health Co-ordinators for further information and advice, the DH decided that the brief intervention aspect of the care pathway should be based on the Motivational Interviewing approach. They also concluded that it would be necessary for all health care professionals from the eight pilot practices to attend Motivational Interviewing and physical activity promotion training. They further decided that they would need to bring in an external consultant to deliver the training.

The DH and the North London Physical Activity and Health Co-ordinator put together a tendering process for the external consultancy project. I decided to submit a proposal for this contract. I felt that it would be a good opportunity for me to develop my consultancy skills, as I felt they were limited in this area, in addition to further developing my training skills. However, prior to preparing a written proposal at the tendering phase for submission to the DH, I carried out an assessment of the request for consultancy on its feasibility (see Appendix C4 – Assessment of request for consultancy). Based on the requirements set out within the DH tender document, I put together a written proposal that demonstrated how my training would fully meet the requirements of the draft physical activity care pathway (see Appendix C5 – Consultancy proposal). Within the proposal I provided details on the course materials in the form of a course outline and course handouts, the aims and learning outcomes, evidence of delivering similar training, a draft evaluation feedback form for participants to complete pre and post training, a list of referees of my previous clients, and the fees for the consultancy. I also enclosed copies of the support materials I had designed for the training in

addition to completed evaluation forms of training courses I had delivered in the past. The deadline for the submission of the written proposal was 11th June 2007. I received confirmation in writing that my proposal was successful on 3rd July and an overall consultancy fee of £[REDACTED] was agreed.

Reflection

A learning point for me at this stage of the consultancy was in the calculation of the consultancy fees. Although I was confident in the fees I charged for the delivery of the actual training, I failed to identify and factor into my fees the time I might spend liaising with the client, their partners and the other training providers brought in to deliver a component of the training, which was time consuming. In addition, I did not factor in the cost for printing the training materials and other administrative tasks I carried out that were associated with the consultancy.

I have identified through this consultancy process that improving my financial skills is an area for my further development as a health psychologist.

Planning consultancy

My written proposal was based on the delivery of two 2-day Motivational Interviewing courses and two 2-hour physical activity promotion workshops. However, the DH advised me that the training had to be delivered within a two day period for each training course. This decision was based on the fact that health care professionals would find it difficult to leave their practices for long periods. Coupled with this, the DH had a limited budget for payment to the pilot practices to cover locum costs to allow them to attend the training. In light of this, I had to revise my proposal to meet the needs of the DH requirements.

I had initial concerns regarding the feasibility of delivering the Motivational Interviewing and physical activity promotion training within 1.5 days and 1.5 hours respectively as opposed to 2 days and 2 hours, as per my original proposal. I spent time revising the physical activity promotion training and set up a series of meetings with my co-trainer regarding reducing the duration of the Motivational Interviewing training. Following these meetings, it was agreed that delivering the Motivational Interviewing within the shortened timeframe was feasible, and without reducing the quality of the training.

The consultancy was relatively straightforward and problem-free. The main challenge I faced concerned the number of partners involved in the project, namely the DH Team, several PCT leads, and three Physical Activity and Health Co-ordinators. This often resulted in a delay in arriving at decisions, for example, in re-negotiating the training dates across the eight practices, which was a lengthy process.

As I was delivering two out of the three components of the training, it was necessary for me to liaise with the other training provider, namely Natural England. Their role was to deliver a one-hour training workshop to equip the health professionals with the skills and knowledge to promote the use of step-meters (discrete motion sensors worn to assess physical activity levels) in general practice as a tool to increase physical activity initiation and maintenance. Communication with Natural England was made by telephone and by email to ensure that our training was complementary to each others, and to avoid the duplicating of information. This was achieved through firstly being clear about the aims and objectives of our individual training programmes, and secondly by exchanging our training outlines, plans and presentations. From this sharing of information it was apparent that there was some duplication in our training content. We then discussed how to resolve this issue and revised our training materials based on the outcome of these discussions. Once the agreed amendments were made, we again shared our training materials to ensure that the relevant changes had been made.

I used the 'expert' model of consultancy for the main part when acting as an external consultant, and the 'process' model for the first part of the consultancy process when I was acting as an internal helper, giving advice from a health psychology perspective on the development of the draft physical activity care pathway. The 'expert' model proposes that the client is unable to provide the service itself, so purchases an expert service from a consultant⁵. The client in this case was the DH who requested the services of a consultant with experience in health behaviour change and physical activity promotion training to deliver the training for the health care professionals.

Reflection

Although I deliver both Motivational Interviewing and physical activity promotion training on a regular basis, this consultancy project was a challenge, as it had to be delivered in a shorter timeframe than I would usually deliver the training in, to cater for the client's needs. I had to carefully re-structure the training plan to ensure that the content and quality of the training was not compromised.

Establish, develop and maintain working relationships with client

My working relationship with the client and the Health and Physical Activity Co-ordinator (my two main contacts for the consultancy), was via telephone, email and through face-to-face contact in the form of meetings. I had already formed a close working relationship with the North London Physical Activity and Health Co-ordinator prior to my involvement in this pilot project, having worked with her over the past year and a half on a range of physical activity issues. I felt that this made it easier in the early stages of the consultancy when forming relationships with the DH Team, whom I had not worked with previously.

As the duration of the main consultancy was relatively brief (July to September 2007), and the nature of the consultancy was straightforward in delivering training, no particular difficulties arose. The only issue that arose concerned the payment of my consultancy fees. The original invoice I submitted went astray within the Accounts Payable Department and had to be re-submitted on a few occasions. However, this issue was eventually resolved and payment received.

Conduct consultancy

The two training programmes were delivered on 31st July-1st August 2007 and 5th-6th September 2007, and despite my initial concerns the training was delivered successfully and within the reduced timeframe.

In addition to the health care professionals attending the first training programme, it was also attended by the DH lead and the three London Physical Activity and Health Co-ordinators, to enable them to gain more of an insight into the Motivational Interviewing approach. The evaluators from the British Heart Foundation National Centre for Physical Activity and Health (BHFNC) also attended as observers.

Evaluate the impact of consultancy

The DH commissioned the BHFNC, based at Loughborough University, to evaluate the overall project, namely to examine the feasibility of implementing the pilot physical activity care pathway from both the practitioner and patient perspective using a range of evaluation methodology. However, it was important for me to evaluate the practitioner's perspective of the usefulness of Motivational Interviewing and the physical activity promotion training, which would feed into the overall evaluation process. I designed a pre and post-training questionnaire to evaluate the training, which was closely linked to the training aims and objectives. The training was evaluated positively, and the

results demonstrated a subtle increase in the health care professional's perception of the importance of promoting physical activity, and a definite increase in their perception of their ability to help their patients to improve their physical activity levels.

Reflection

I believe that the evaluation of the consultancy provided the client with the confidence and evidence that my input as a consultant into the DH pilot was useful, valid and met the requirements of the DH Physical Activity Care Pathway.

Conclusion

My experience of undertaking this consultancy project was extremely positive and enjoyable, providing me with a learning opportunity within a reputable NHS organisation. This was in part due to the fact that the consultancy was overall well planned and structured by the client. This experience has given me the confidence to look for further consultancy opportunities within areas in which I am appropriately qualified and experienced. Working through the consultancy process was also useful in that it helped to highlight my need to further develop as a consultant in the area of my financial skills. In particular, I feel I need to improve my skills in budgeting for consumables including printing costs, advice giving and other administrative activities.

APPENDIX C4 – Assessment of request for consultancy

Training for DH Physical Activity Care Pathway Pilot

1. **Who is the client?**

The Department of Health.

2. **What is the question?**

To provide training to equip health care professionals involved in the DH Physical Activity Pilot with health behaviour change and physical activity promotion skills. The DH have yet to decide the number of training courses they will require for the pilot, but suggest it may be two.

3. **What is the background and organisational context?**

Increasing physical activity levels is a key government agenda. The piloting of a new DH Physical Activity Care Pathway for use within the primary care setting will test the feasibility of this process. The overall aim is to embed physical activity within NHS systems and within patient notes. A further aim is to develop a framework for health care professionals for the provision of one-to-one support for patients to help them to become more active. However, based on research evidence, physical activity is poorly promoted within this setting and health care practitioners require training to help support them in fulfilling this role.

4. **Why has the client contacted you?**

The DH were familiar with work I had developed in the area of physical activity, eg. BHF action research project and training in the areas of physical activity promotion and Motivational Interviewing. They were also aware that I was a trainer in the Motivational Interviewing

approach and a member of the Motivational Interviewing Network of Trainers (MINT).

5. **What is the timeframe for the work?**

Potentially June – September 2007 (TBC).

6. **Does the client have a realistic appraisal of what you can achieve?**

Yes – physical activity and Motivational Interviewing training for the health care professionals involved in the pilot project.

7. **What is the client's 'bottom line'?**

The 'bottom line' was that following the training should health care professionals should:-

- have had the opportunity to practice using the motivational interviewing approach and developed skills to assist their patients to become more physically active (including assessing readiness to change, goal setting);
- be able to use the DH General Practice Physical Activity Questionnaire to assess the physical activity status of patients,;
- understand the moderate intensity physical activity message;
- be aware of the Chief Medical Officers physical activity message;
- be knowledgeable about the benefits of physical activity and disease correlations associated with inactivity

APPENDIX C5 – Consultancy Proposal

Tender to provide Motivational Interviewing and Physical Activity Promotion Training for DH Physical Activity Care Pathway Plot

Motivational Interviewing (MI)

Practitioner Workshop: Introduction to the Theory and Practice of Motivational Interviewing

This 2 day training course has been developed as an introduction to Motivational Interviewing for people with little or no prior experience of, or training in Motivational Interviewing (MI).

Aims:

- To introduce the principles, key skills and philosophy of Motivational Interviewing.
- To explore the application of Motivational Interviewing within general practice.
- To provide opportunities to practice skills within a safe environment.

Learning Outcomes:

- Participants are aware of the basic principles of the MI approach and applicability of this approach within their work setting.
- Participants leave with an enhanced understanding of the MI concepts such as resistance, ambivalence, readiness and motivation.
- Participants leave with an alternative framework to work with their clients in the area of making behaviour change.
- Participants have increased confidence in their skills to assist patients who wish to change, for example, in assessing readiness to change and in making appropriate referrals.

Training Delivery

The workshop will be delivered using an interactive model, which includes brief trainer-led presentations, group discussions, role-play, demonstrations, small group work and video footage. Emphasis will be placed on making the training interactive. Materials will be presented in different ways to accommodate different learning styles. The focus is on developing practitioner skills.

Outline of Programme

A proposed outline of the 2-day workshop is provided below. The right is reserved to amend the programme in response to practitioner needs as they emerge during the training.

DAY 1

0930 -1000	Introductions, Needs Assessment, exploring practitioner expectations and Orientations
1000 -1100	MI context – overview of training and introduction
1100 – 1130	Break
1130 – 1230	Overview of MI – What is it? Introduction to core concepts
1230 – 1330	Lunch
1330 – 1500	Key skills – theory and practice <ul style="list-style-type: none">• Open-ended questions• Affirmations• Reflective Listening• Summarising
1500 – 1515	Break
1515 – 1630	MI consistent vs MI inconsistent practice Setting the Agenda

DAY 2

0900 – 0930	Welcome Back Reflection, review and questions
0930 – 1030	How do people change?
1030 – 1100	Break
1100 – 1200	Ambivalence Exchanging information/goal setting (eg. implementation intentions)
1200 – 1300	Lunch
1300 - 1400	Dealing with resistance
1400 – 1430	Break
1430 – 1600	Application to practice Questions, reflections and evaluation

THE TRAINER

Vanessa Bogle has a clinical background in physical activity and smoking cessation and a research background in physical activity and behaviour change. She also has a background in health promotion/public health, and 13 years of teaching exercise.

Qualifications

BSc (Hons) Health and Fitness

Post Graduate Diploma in Psychology

MSc Health Psychology

Currently undertaking a Doctorate in Psychology (Health)

Various exercise qualifications including BACR Phase IV Instructor Certificate, Falls Prevention

Member of the Motivational Interviewing Network of Trainers (MINT) and was trained to deliver MI training through the Centre of Motivation and Change in the Netherlands. All co-trainers are members of MINT.

MI Training Cost (per day workshop)

Expenses are calculated to include trainer fees and associated costs (2 trainers to deliver MI training).

Total Cost: £3,400

Optimal No. of participants per MI training programme:

Minimum of 10 and maximum of 25

Training – Physical Activity Promotion

Physical Activity Promotion Workshop (2 Hours)

This 2-hour workshop has been developed based on the BHF Physical Activity Primary Care Toolkit.

Aims:

- To increase knowledge and awareness of the benefits and recommendations for physical activity promotion amongst frontline primary health workers, eg. GPs, practice nurses.
- To introduce the General Practice Physical Activity Questionnaire.

Learning Outcomes:

- Participants understand the importance of physical activity promotion in promoting positive health.
- Participants are knowledgeable about current physical activity levels and recommendations.
- Participants are able to offer patients general physical activity advice relating to the moderate intensity message.
- Participants are able to use the GPPAQ to assess the physical activity status of patients.

Training Delivery

The workshop will be delivered using an interactive model, which includes brief trainer-led presentations, group discussions, practice sessions and demonstrations. Emphasis will be placed on making the training interactive.

Outline of Programme

A proposed outline of the 2-hour workshop is provided below.

Overview of the training	5 minutes
The case for physical activity	15 minutes

Current physical activity patterns	10 minutes
CMO physical activity recommendations	10 minutes
Moderate intensity physical activity	10 minutes
Barriers to becoming more active	5 minutes
General Practice Physical Activity Questionnaire	20 minutes
Case Studies (practice session)	30 minutes
Questions and Evaluation	15 minutes
TOTAL	2 HOURS

Physical Activity Promotion Training Cost (per 2-hour workshop)

Expenses are calculated to include trainer fees and associated costs (1 trainer to deliver physical activity promotion training).

Total Cost: £350

Optimal No. of participants per Physical Activity Promotion workshop:

Minimum of 10 and maximum of 25

MI TRAINING TIMETABLE – DAY ONE

SESSION	OBJECTIVES	DURATION
Introduction, needs assessment and orientations	<ul style="list-style-type: none"> ▪ For the facilitators and participants to introduce themselves. ▪ To determine any previous knowledge/training in this area. ▪ To identify learning needs (via 'Wish List') and form learning contract. ▪ To make participants aware of housekeeping: emergency procedures, fire exits, location of toilets. ▪ To set 'Ground Rules'. 	30 mins
MI Context	<ul style="list-style-type: none"> ▪ To set the scene and acknowledge that behaviour change is a complex issue. ▪ Brief introduction of MI as a style of communication/counseling to facilitate behaviour change. 	60 mins
Overview of MI – What is it?	<ul style="list-style-type: none"> ▪ Introduction to MI ▪ Introduction to the key principles that underpin the approach with a specific focus on expressing empathy. 	60 mins
Skills, theory and practice	<ul style="list-style-type: none"> ▪ Introduction to the key techniques (open ended questions, affirmations, reflective listening and summarising). ▪ Introduce methods for eliciting change talk. ▪ Introduce the concept of resistance and reflective listening using 3 exercises to facilitate learning. 	90 mins
MI consistent versus MI inconsistent & Practice and agenda setting	<ul style="list-style-type: none"> ▪ MI video demonstration to compare the 2 styles of communication and to raise awareness of the possible impact on clients using these approaches. ▪ To teach participants a framework for negotiating a consultation agenda when considering a number of health behaviour changes. 	75 mins

MI TRAINING TIMETABLE – DAY TWO

SESSION	OBJECTIVES	DURATION
Welcome back, learning and questions	<ul style="list-style-type: none"> ▪ Brief recap of Day 1 ▪ To determine what the group has learned and whether the learning outcomes have been met. 	30 mins
How do people change?	<ul style="list-style-type: none"> ▪ To introduce the concepts of readiness/motivation and the Stage of Change Model. ▪ To give participants an opportunity to practice assessing readiness to change. 	60 mins
Ambivalence & Exchanging information/goal setting	<ul style="list-style-type: none"> ▪ To introduce the concept of ambivalence. ▪ To give participants an opportunity to practice a range of strategies to explore and work through ambivalence. ▪ To offer participants a range of strategies for exchanging information/goal setting (eg. implementation intentions) with patients. 	60 mins
Dealing with resistance	<ul style="list-style-type: none"> ▪ To introduce the concept of resistance and ways of dealing with patient resistance. ▪ Exercise to allow participants to practice dealing with resistance. 	60 mins
Application to practice & Questions and reflection	<ul style="list-style-type: none"> ▪ An open session to provide participants with the opportunity to practice using MI skills. ▪ To address questions placed in the 'parking lot'. ▪ To revisit the 'Wish List' to assess whether participants' learning needs have been met. ▪ For participants to reflect on the training. 	90 mins
Evaluation	<ul style="list-style-type: none"> ▪ Training evaluation. 	15 mins

Optional unit 5.8 – Case Study

Disseminate psychological knowledge to address current Issues in Society

Neighbourhood Renewal Fund – Haringey Exercise Referral Scheme

Background

The Neighbourhood Renewal Fund (NRF) is a time-limited central Government funding programme available to 88 local authorities in England with the 10% most deprived wards. Five of Haringey's super output areas are amongst the top 3% of the most deprived wards in England. Neighbourhood Renewal Funding assist the main public sector service providers and other key agencies in thinking about how services could better meet the needs of people in deprived neighbourhoods, in collaboration with their Local Strategic partnerships (LSP) who are responsible for making decision on how the NRF is spent, and approve the programme.

I will describe how I successfully submitted a NRF application to establish an exercise referral programme for people living within the most socially deprived areas in Haringey who are at high risk of cardiovascular disease, including those who experience mental health problems.

Awareness of funding opportunity

It was brought to my attention by the Director of Public Health that there was a funding opportunity to bid for NRF monies under the Healthier Communities and Older Peoples block to address the issue of high rates of physical inactivity within the borough.

Under the Well-being block of the Haringey LSP the Board identified 3 areas of priority for funding, namely, 'Be Healthy', 'Achieve Economic Well-being' and 'Meeting Current and Future housing Need', with physical activity falling under 'Be Healthy'. The physical activity target set by the Board was for 500 adults to participate in at least one 30 minute session of physical activity of moderate intensity per week for at least three months.

Seeking partners

I conducted a mapping exercise to identify and understand the stakeholders/partners who could potentially work together on the project (outlined below). I highlighted the remit of these organisations in preparation for future dialogue and possible joint working. This provided a valuable starting point in guiding the information collection process. In identifying key stakeholders and what groups were in existence and the nature of their activities, I made links with two key information sources as the first step, namely the Local Authority (Neighbourhood Management and their Leisure and Recreation Departments) and the Haringey Association for Voluntary and Community Organisations (HAVCO). I felt HAVCO were an important contact given their close links with voluntary and community organizations, which assisted in compiling a list of key stakeholders at later stages.

After carrying out the above exercise, I arranged and chaired numerous meetings with colleagues from both within and outside of the NHS who could potentially be involved with the project.

An important task was to develop a project proposal plan and project outline. This involved bringing key people together to discuss and develop the proposal further based on my initial project outline. This process enabled me to ensure that all potential partners were clear about the project in general, its aims and objectives, and to ensure that there was clarity about their possible involvement should the bid be successful. It also served to gain their commitment to the project, for example, in agreeing in-kind contributions such as staff input and free venue use.

Community Profile

Early on in the planning phase, I conducted a community profile to gather information about the 3 neighbourhoods which helped me to build a picture of the nature and needs of the community. This included gathering information regarding the community in general; data on demographics, morbidity and mortality, economic activity, community issues, places with cultural significance such as places of worship that may form a key part of the project, housing and household data. This task also involved looking at the most recent census data and at ethnic minority data. This information was sourced from data collected by the Public Health department, 2001 Census data, Department of Health - Health Profile for Haringey 2006, and from data held by the Local Authority in the form of local needs assessments and resident surveys.

Information required by Funders

The funders required a detailed outline of the proposed project.

NRF required information regarding a description of any equalities issues the project would address. Information was also needed regarding how the project would improve or maintain performance against the neighbourhood renewal floor targets (the key outcome areas being Housing, Liveability, Crime, Worklessness, Education and Health) and how this would be

demonstrated. The NRF floor target related to physical activity fell under the heading of 'Health', the target being life expectancy, specifically to substantially reduce mortality rates from heart disease and stroke and related diseases by 40% in people aged under 75 by 2010, with at least a 40% reduction in the inequalities gap between the fifth of areas with the worst health and deprivation indicators and the population as a whole. In addition, the target was to substantially reduce cancer by at least 20% in people under 75, with a reduction in the inequalities gap of at least 6% between the fifth of areas with the worst health and deprivation indicators and the population as a whole. NRF needed information on how the project would directly address the NRF floor target.

The funders also wanted information on the measurable outputs from the project that would be supported by evidence, and what the longer term outcomes of the project would be. They also needed information regarding how the project would be evaluated, and information outlining details of any in-kind contributions for the project.

Consultation process

Neighbourhood Management Teams, via the Neighbourhood Managers, in each of the 3 Wards were consulted. Neighbourhood Management is a Government campaign to tackle social exclusion at a local level and to improve services for local people. Haringey have Neighbourhood managers working across the whole borough who also have a team of staff including Community Development Officers and project workers. Neighbourhood Management bring the council and other agencies together with local people to tackle local problems. This may involve developing or initiating local projects that address local issues and needs. They also have a role in community capacity building and in partnership development (ie. community involvement). They were consulted with to gain their commitment to the project. Their insight into their local community was invaluable, as was their knowledge of suitable venues in the local community to run the activities from. I was also keen to discuss possibilities for in-kind contributions to the project, for example in gaining free/subsidised use of council facilities. They also had

specific knowledge regarding how best to target and engage with the local people and how best, and where to advertise the project. It was also important to ascertain how they could assist in disseminating resource material to promote the project, ie. to local community groups and faith groups, and to recruit volunteers, for example, to lead the walking programmes in the local area.

I also consulted with the Public Health Information Analyst at HTPCT to gain local information regarding population data relating to the 3 wards which contributed towards the community profile exercise.

The Head of Library Services and the Library Social Inclusion Manager were consulted as they are very much engaged in health promotion activities within their setting. For example, Primary Care Mental Health Workers were soon to conduct work with the people with mental health problems within the library setting. Library Services had previously expressed interest in their staff being trained to lead walks from their libraries and also offered the free use of space in the library to hold physical activity sessions and in promoting the project across libraries in Haringey. It was agreed that their in-kind contribution to the project would be to lead walks from libraries and to offer free use of space within the library setting to run physical activity sessions.

I met with a range of colleagues with a work remit around mental health, including, an Occupational Therapist Manager, a Nurse Consultant and Manager of HTPCT Primary Care Mental Health Workers. In addition, I met with a Primary Care Mental Health Worker whose role was to help general practitioners to meet the needs of people with mild to moderate mental health problems who do not require the specialist services of secondary mental health care. One of their roles was to provide resource and service information for people and to provide one-to-one clinical work in surgeries. It was felt that they would be in a position to raise awareness of the physical activity initiative amongst other mental health professionals, and through their direct work with patients, for example, via GP surgeries or other community

based projects, identify people suitable for accessing the physical activity initiative.

An Occupational Therapist Manager (OT) from a Haringey based service, namely the Haringey Therapeutic Network (HTN), was consulted with about the project. HTN provides specific group work (6-12 weeks) and offers support for people with mental health problems, ranging from mild to severe conditions, to gain self-confidence and self-esteem. The organisation is run by a multi-disciplinary team of mental health professionals. The consultation process aimed to explore how best to support their clients, particularly those with severe mental illness in accessing the project. It was felt that certain people may require one-to-one support so this formed part of the discussions. Specific discussions were centred on the feasibility of their staff accompanying their clients to the physical activity sessions and offering them one-to-one support under the guidance of a trained exercise practitioner. This was seen as being of extreme important in addressing equality issues and in fostering social inclusion.

As the Lead for Physical Activity and Obesity, I work closely in partnership with the Leisure and Recreation Services of the Local Authority (LA). I contributed to the LA Sport and Physical Activity Strategy, which identifies the need for an exercise referral scheme in Haringey. In light of this, Leisure and Recreation Services were already signed up to the intervention. Discussions centred around important practical issues such as numbers of staff who would need to be trained to deliver the centre-based activities, training needs of staff (particularly in the area of health behaviour change counselling), desk space to accommodate the scheme co-ordinator on a part-time basis, line management reporting, etc. These discussions took place at an early stage to ensure that Leisure and Recreation Services were still committed to this work.

The Haringey Smoking Cessation Team were consulted to establish whether they would be able to provide basic training for leisure staff, as the project also aimed to equip the project staff, ie. exercise practitioners, with the

necessary skills to signpost participants interested in quitting to support in the community, ie. the NHS Smoking Cessation Service.

The Deputy Director for Primary Care Commissioning was also consulted, who was able to direct me to her colleague to gain specific information about the new changes in the way GPs work, for example, practice based commissioning (PBC). PBC aims to enable GPs and other front line staff to redesign their services so that they are more tailored to the meet the needs of their patients. With this in mind it would be reasonable to suggest that if this project proved effective that an exercise referral scheme may be a service GP collaboratives could commission in the future. In addition, I was given information regarding which practices to target due to proximity to the target wards, practice population sizes along with details regarding the percentage of the patient population living within the 3 target wards. Suggestions were also made regarding approaches to assist in getting practices to 'buy in' to the project, ie. through delivering presentations at various GP collaborative meetings, of which there are four in Haringey, and in identifying key professionals who could 'champion' the project.

Seeking advice

I sought advice from my line manager (Deputy Director of Public Health) for support in writing the proposal, as she has an excellent track record in submitting successful grant proposals, including obtaining Big Lottery Funding in the sum of £1 million for a Healthy Living Initiative. I also contributed towards writing the aforementioned proposal. I also sought advice from my initial supervisor for my workplace training for stage II at City University, namely Catherine Sykes, who gave me some specific advice regarding the importance of careful planning around the project budget as I felt I had not appropriately budgeted for certain equipment, namely pedometers to assist in the evaluation process.

Identification and analysis of health psychology literature to inform the application

The grant proposal had a strong health psychology theoretical basis. This was informed by my search of a range of current literature, focusing on the areas of health behaviour change, with a specific focus on motivational interviewing (MI)¹³ and implementation intentions¹⁴, health inequalities experienced by people with mental health conditions¹⁵, local data on the Haringey population (including issues around inequalities in health)¹⁶, and reviews in the area of the effectiveness of physical activity interventions^{17 18}.

A review of the physical activity general literature revealed that much of the research was not conducted within a psychological theoretical framework. The literature also suggested that further studies were needed in this area, particularly studies conducted within the UK, as the vast majority were US studies, which may not be representative of the UK population.

Further results from my search showed MI to be more effective than traditional advice giving in the treatment of a range of diseases that to some degree are influenced by behaviour, including smoking, alcohol abuse, drug addiction, sexual health, physical inactivity and over-eating¹. Having trained as a MI practitioner and then later going on to become an MI trainer in August 2005, I already had a special interest in this approach to facilitating health behaviour change. I was very keen to examine the effectiveness of

¹³ Miller, W. R. and Rollnick, S. (2002). *Motivational Interviewing: Preparing People for Change*. The Guildford Press. New York

¹⁴ Orbell, S. and Sheeran, P. (2002). Changing Health Behaviours: The role of implementation intentions. In: Rutter, D. and Quine, L. (Eds). *Changing Health Behaviour*. Open University Press

¹⁵ Department of Health. (2006). *Choosing Health: Supporting the physical health needs of people with severe mental illness*. Department of Health. London.

¹⁶ Haringey Teaching Primary Care Trust. (2005). *Growing up in Haringey: Haringey Health Report 2005*. Column Communications Limited. London.

¹⁷ Health Development Agency. (2004). *The Effectiveness of public health interventions for increasing physical activity among adults: A review of reviews*. Health Development Agency. London.

¹⁸ National Institute of Health and Clinical Excellence. (2006). *Four commonly used methods to increase physical activity: brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling*. *Public Health Intervention Guidance No.2*. Department of Health. London.

psychological approaches in increasing physical activity within exercise referral schemes.

It was also clear from reviewing the physical activity literature that there was a need for more studies to be carried out to examine the effectiveness of exercise referral schemes to encourage people to become more physically active. Recent public health intervention guidance states that exercise referral schemes should only be endorsed if part of a properly designed and controlled research study to determine effectiveness. However, the guidance recommends the use of brief interventions in primary care to increase physical activity, ranging from basic advice giving to more extended individually-focused approaches, for example, motivational interviewing⁶. I also conducted a literature search on the effectiveness of implementation intentions (a specific plan outlining the when, where, and in what manner to implement a goal intention) as an approach to helping people enact their intentions. Evidence suggests that individuals are more likely to be successful in enacting intended behaviours having formed implementation intentions².

Lastly, I searched the literature in the area of the physical health needs of people living with mental illness. It was well documented that people living with severe and enduring mental illness are at increased risk of physical ill-health, including coronary heart disease, obesity and diabetes. Government have identified mental health as a priority area for health improvement and have acknowledged that the physical health of this group are worse than the rest of the general population and that helping this group to lead more healthy lifestyles would have a positive outcome on their mental and psychological well-being as well as their physical health³. The design of the proposed intervention was informed by the results of the above literature search.

The literature search served to ensure that the application was evidence-based and grounded in health psychology. In addition, the process enabled me to ensure that the funders were provided with sufficient background information concerning the issues regarding the lack of physical inactivity

provisions available for the least active people living in Haringey and potential benefits of such an intervention on physical and mental health outcomes. It also served the purpose of demonstrating my knowledge and understanding (as the applicant for funding) of the topic.

Given the recent publication of the National Institute of Health and Clinical Excellence (NICE) Guidance on methods to increase the population's physical activity levels, I felt that my application for funding was timely.

Evaluation

This application was successful, receiving funding in the sum of £84,000 for 2006/2007 and further funding for 2007/2008 to be considered pending a review in February 2007 based on the project having achieved its targets. The amount originally bid for was £90,000.

The potential impact of my funding application is vast in that it targets those at highest risk of cardiovascular disease, which is one of the NRF national floor targets, namely to substantially reduce mortality rates from cardiovascular disease, in addition to the cancer target as outlined above. The application is also targeted at the most deprived wards in Haringey and so addresses health inequality issues. Given the strong evidence highlighting the health hazards associated with inactivity, achieving sustained participation rates has the potential of significantly impacting on reducing cardiovascular disease and some cancers amongst the Haringey population, in addition to fostering social inclusion.

Reflection

Although I have some experience in writing grant applications through having contributed to certain sections of others' proposals, this was my first experience of taking the lead on the writing of a bid. This was a very exciting

and challenging opportunity for me, and I felt that being successful with the bid was within my capabilities. However, at the same time I felt pressured that the bid must be successful. These feelings were related to the current financial situation within the PCT, in that resources were extremely scarce due to recent cuts, and the need to secure funding to enable the department to meet work objectives. My confidence was built on my previous experience in the area of physical activity and in the design of interventions to increase the uptake of physical activity, and also to my more recent experience in the area of health behaviour change which I felt assisted me in this task.

The process was very thought provoking, and as a result I have gained a better understanding of the need to consider psychological approaches with regards to social issues, for example, the role of exercise in creating opportunities for social interaction within the community for people with mental health problems. In addition, it has heightened my appreciation of community health psychology, for its role in addressing health inequalities at a local level¹⁹. In particular it has made me think more about the role that social structures play in sustaining ill-health within communities and why it is so important to focus on both individual and social change. From this, I can see that in addressing health inequalities there needs to be much more of a focus on lobbying to change these structures to enable individuals to change their behaviour. Much of health psychology has focused on individual determinants of health, often overlooking how individual and wider determinants of health are influenced by the broader social context proximal. I plan to revise a draft Obesity Strategy I am currently writing, by developing an additional strategy objective highlighting the need to lobby for policy change, as a direct result of what I have learnt from undertaking this task.

¹⁹ Campbell, C. and Murray, M. (2004). *Community Health Psychology: promoting analysis and action for social change*. *Journal of Health Psychology*. 9(2). 187-195.

There was a relatively short deadline for the grant proposal to be submitted. This factor did not allow me time to develop my skills further in this area prior to submitting this grant proposal. For example, I would feel it would have been of benefit for me to have attended a workshop on writing grant applications. However, I feel that my time management skills assisted in enabling me to complete this piece of work within the allocated time given. In addition, despite this task being challenging, I believe I have developed new skills and enhanced existing ones, including my influencing and negotiating skills. The skill I believe I have enhanced most is in my ability to impart my knowledge in the area of health psychology to others, for example, in stressing the importance of health promotion interventions being designed within a theoretical framework, which as a result is likely to be more effective in helping people to change their behaviour.

Lack of time was the major limiting factor in putting the proposal together, and in hindsight I would have planned my timetable more effectively. Unfortunately, the approach adopted, resulted in me working extremely long hours to ensure that I met the deadline which could potentially have been avoided.

I am currently acting as the joint lead with the Local Authority in submitting a physical activity stretch target for the Local Area Agreements (LAAs), which aims to improve local public service delivery. Funding is attached to achieving these targets. Some of the skills I have developed in writing this grant proposal have been transferable and have assisted me in this work.

As part of my continued professional development I have enrolled on a bid writing course (Bid Writing – How to write a bid so that it wins funds) to further develop my skills in this area. This is a half-day workshop taking place in November 2006 which is being run by The Kings Fund (KF), an independent charitable foundation that works for better health, with a specific focus on

London. Since writing the bid I have also attended a KF half-day workshop on Managing External Funding to enhance my budgetary management skills further.

Conclusion

The potential impact of the physical activity intervention is great, addressing physical health and health inequality issues, in addition to the broader social context of these issues. The proposal was developed within a theoretical framework and is a good example of evidence-based practice. The importance of health psychology in addressing the above issues is invaluable. However, health interventions informed by health psychology in this area are scant.

I enjoyed completing this piece of work and was pleased with the outcome of the grant application. As resources are currently scarce within the NHS, it will be important for me to seek further funding opportunities and I look forward to repeating this exercise and using the skills learned from my first attempt.

Optional Unit 5.4 – Case Study
**Provide psychological advice to aid policy decision making
for the implementation of psychological services**

**Obesity Strategy Development and
Action Plan Implementation**

Introduction

I will describe my experience of developing a local obesity strategy within my role as Public Health Strategist (Long Term Conditions) at Haringey Teaching Primary Care Trust (PCT). This work also involved developing an adult obesity care pathway and an adult obesity resource care pack to help guide health professionals to manage overweight and obesity issues within the primary care setting. The care pathway and resource care pack were developed across the North Central London (NCL) sector, within an Obesity Working Group, of which I was a member of, made up of representatives from five Primary Care Trusts (PCTs).

Background

Obesity is a national government priority, with obesity increasing at a rapid rate within the UK²⁰. The consequences of obesity on the nations health is well documented and are addressed in numerous Government documents and reports including the Choosing Health White Paper, “Choosing Health: Making healthier choices easier”¹ and more recently the Foresight Report,

²⁰ Department of Health (2004). *Choosing health: Making healthier choices easier*. London. Department of Health.

“Tackling Obesity: Future Choices – Project Report”²¹. For professionals working on the preventative and management agenda of obesity there is increasing pressure for action to halt this upward trend. However, to-date the evidence for effective prevention and treatment is inconclusive^{2,22}.

Based on the above, and following a review of my work programme, I identified the development of a local Obesity Strategy as a key task for me to undertake, as the lead for obesity within the Public Health Department. The aim of the strategy was to set out a strategic approach to prevent overweight and obesity developing locally amongst adults and children and to manage existing cases of overweight and obesity. A further aim of the strategy was to gain more of an understanding of the local trends in overweight and obesity. I commenced developing the strategy in December 2006 and completed it in January 2008. During this time I developed work within this area, including the submission of successful grant applications for the funding of healthy eating and physical activity interventions.

Reflection

As this was my first attempt at developing a strategy, I was initially a little daunted by this task. In addition to this, I was conscious of the fact that this task would be undertaken at a time of major change within the PCT in general. Within the Public Health Department, we were going through a restructuring process, which also involved changed roles and responsibilities. Shortly following the restructuring, the Director of Public Health left the organisation and we were unfortunately left in a position of uncertainty, with no clear directorate objectives. I also had a change to my line management, which resulted in me receiving little support in developing this piece of work,

²¹ Government Office for Science (2007). *Foresight. Tackling Obesities: Future Choices – Project Report*. London. Government Office for Science.

²² National Institute for Health and Clinical Excellence (2006). *Obesity: the prevention, identification, assessment and management of overweight and obesity in adults and children*. London. NICE.

especially in the earlier stages. However, despite the above I was also quite excited by the challenge ahead of me.

Assessment of key policy drivers

My starting point was to form a structure for developing the strategy. I initially set about reviewing local strategies developed in other PCTS and the recommendations from “Choosing Health”¹, from which I then developed an outline structure for the strategy. During the mid point of 2007 a toolkit to assist in the development of local strategies to tackle overweight and obesity was published, produced by the National Heart Forum in association with the Faculty of Public Health and the Department of Health²³. This toolkit proved invaluable, in that it provided me with a suggested structure, and I was pleased that what I had developed so far was consistent with that suggested. I identified the key chapters of the strategy as follows:-

1. Introduction
2. Strategy aims and objectives
3. Background
4. Policy Context
5. Existing and planned work to tackle overweight and obesity
6. Implementation
7. Monitoring
8. Evidence-base for effectiveness of interventions

²³ National Heart Forum (2007). *Lightening the load: tackling overweight and obesity. A toolkit for developing local strategies to tackle overweight and obesity in children and adults*. London. National Heart Forum.

9. Appendices (action plan, summary of evidence-base for effectiveness of interventions, adult obesity care pathway)
10. References

I then carried out a more extensive review from a psychological perspective, which revealed a clear consensus of the need for preventative action, requiring significant behaviour change in the areas of increasing physical activity levels and healthy eating. Policy documents and reports reviewed included the “Choosing Health” White Paper¹, the key policy driver for tackling obesity, in addition to the “Foresight Report”², “At least five a week”²⁴, National Service Frameworks for Coronary Heart Disease²⁵ and Diabetes²⁶, “Every Child Matters”²⁷ and “Tackling Health Inequalities”²⁸.

I also reviewed the National Institute for Health and Clinical Excellence (NICE) guidance, on obesity³, behaviour change²⁹ and physical activity³⁰, the findings of which helped to inform the obesity strategy action plan. NICE produced guidance on four commonly used methods to increase the populations physical activity, including brief interventions in primary care. Brief interventions were defined as ‘any brief intervention involving advice, encouragement, negotiation or discussion with the overall aim of increasing physical activity delivered in a primary care setting by a health or exercise professional, with or without written support or follow-up’. The evidence from

²⁴ Department of Health (2004). *At least five a week: Evidence on the impact of physical activity and its relationship to health*. London. Department of Health.

²⁵ Department of Health (2000). *National Service Framework: Coronary Heart Disease*. London. Department of Health.

²⁶ Department of Health (2001). *National Service Framework: Diabetes*. London. Department of Health.

²⁷ Department for Education and skills (2003). *Every Child Matters*. www.everychildmatters.gov.uk

²⁸ Department of Health (2003). *Tackling Health Inequalities: A programme for action*. www.dh.gov.uk

²⁹ National Institute for Health and Clinical Excellence (2007). *Behaviour change at population, community and individual levels*. London. NICE.

³⁰ National Institute for Health and Clinical Excellence (2006). *Four commonly used methods to increase physical activity: Brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling*. London. NICE.

eleven studies suggested that this approach can be effective in the short term, longer term and over a very long timeframe. I used this evidence base in the development of various initiatives. They included the physical activity referral scheme, obesity and physical activity care pathway work and a communication skills training programme for healthcare professionals, using Motivational Interviewing³¹, a style of counseling which aims to explore and resolve ambivalence and promote behaviour change.

Recent NICE guidance on behaviour change¹⁰ provided a set of generic principles that can be used in the planning, delivery and evaluation of public health interventions aimed at changing health-related behaviour. The guidance lent support to the communication skills training I had developed, highlighting the need for practitioners to be equipped with the necessary competencies and skills to support behaviour change using evidence-based tools.

Reflection

Conducting this review was time intensive. Having completed this review, I raised awareness of the recommendations and expert advice therein amongst my department. I believe that as a result, my colleagues begun to understand and value the contribution that health psychology has to offer in meeting the health improvement agenda, as many of the health targets depend very much on behaviour change, for which health psychology has a strong evidence base.

³¹ Miller, W. R. and Rollnick, S. (2002). *Motivational Interviewing. Preparing people for change.* London. The Guildford Press.

Development of the Obesity Strategy Action Plan and Commissioning Intentions Obesity Proposal

I developed an action plan to assist in the implementation of the Obesity Strategy aims and objectives, based on the recommendations, evidence and expert advice given within the various government policies and documents. The action plan set out work already underway and planned work, much of which I took the lead on.

Due to the financial situation of Haringey PCT much of the work developed in this area was funded through short-term project money. I highlighted the need for mainstream funding to sustain the work after the short-term funding period ended and to extend existing work and develop new initiatives, for example, health trainers. In October 2006 I was asked by the Director of Public Health to put together a draft commissioning intentions proposal for obesity to enable us to broaden the base of our health development work, it being one of Haringey's key health priority areas. As a result of undertaking this piece of work, one year on, increasing adult participation in physical activity was identified as a key focus area within the Commissioning Strategic Plan (CSP), one of its strategic priorities being to promote a healthier Haringey by improving health and well-being and tackling health inequalities. The CSP is a five-year strategic plan setting out the PCTs commissioning intentions and highlights where the PCT intend to make significant changes through commissioning mechanisms. Much of this work focuses on primary and community services and on early detection and prevention of ill-health. The proposal set out areas of work required to fill the current gaps in provision, in addition to areas of work requiring further development.

Reflection

Developing the action plan involved reviewing the evidence base for the proposed interventions. However, as aforementioned, the evidence base for obesity prevention is inconclusive, but as stated in the Foresight Report²,

given the urgency to address obesity, novel interventions should not be dismissed but should be informed by available evidence and strengthened by expert advice with the need for the evidence base to be developed alongside their delivery. Public Health is very much driven by evidence base, which sometimes leads to my colleagues in Public Health struggling with this concept, requiring the use of my influencing and negotiation skills to 'sell' my plans for investment into innovative interventions to them.

Obesity Care Pathway and Obesity Care Resource Pack Development

An obesity working group, chaired by the Director of Public Health for Islington PCT, was set up across the NCL sector made up of Public Health, exercise practitioners, dieticians and clinical personnel from the five PCTs. The group met on a regular basis to develop a generic care pathway and obesity care resource pack for health care professionals to assist them in addressing overweight and obesity issues. The rationale for this approach was to avoid replicating work across PCTs and to pool resources and expertise. The group met on a regular basis, and the working group agreed the care pathway in February 2007 and resource pack in May 2007.

The working group received a small budget from the Regional Public Health Group to produce the obesity care resource pack and to provide health behaviour change training for front-line staff to support the roll-out of the obesity care pathway. I was instrumental in providing advice from a psychological perspective with regards to the training needs of the front-line staff. I also took the lead on writing the behaviour change section of the obesity care resource pack and in delivering the physical activity promotion training and the behaviour change training, namely a series of 2-day Motivational Interviewing courses on a consultancy basis for Barnet and Enfield PCTs.

Monitor, evaluate and feedback on the implementation of policy in relation to psychological services

Numerous aspects of the action plan have been implemented, and continue to be delivered, including the development of a physical activity referral scheme, a range of community-based healthy eating interventions, physical activity and healthy eating promotion training, health behaviour change training, pilot community-based childhood obesity programme, pilot physical activity care pathway for use in primary care, annual National Child Measurement Programme, PCT Health at Work programme, and the Community Nutrition Assistant Programme.

Due to the restructuring of Haringey TPCT there was no formal structure to monitor the implementation of the draft obesity strategy. However, as the vast majority of the interventions were funded through external funding, they were monitored through the funding body structures, typically on a monthly or quarterly basis. As the PCT have now re-established their structures, progress on the implementation of the strategy will be reported to the Clinical Effectiveness Group and the Commissioning Division Directors.

Make recommendations to change policy

I have been successful in changing policy in several areas, including front-line staff training in health psychology skills to assist people in making change, in line with "Choosing Health"¹ recommendations. As a result of the development and regular delivery of Motivational Interviewing training for a wide range for health care professionals within the PCT, across other PCTs and for the Department of Health, this has resulted in an increase in awareness of the need for such training and the potential benefits of this approach in assisting people to make behavioural changes. In Haringey it has also been proposed that all new practice nurses undertake this training following positive training evaluation. Delivering a lunchtime Continuing Professional Development session also assisted in raising awareness and interest in this approach.

Social Marketing evolved out of “Choosing Health” and is a relatively new concept within the health arena, often viewed with skepticism. Despite backing from the Department of Health, the approach is often misunderstood, and seen as a traditional information giving campaign. However, it moves beyond simply communicating messages and information to actual behaviour. Social Marketing systematically applies marketing principles alongside other concepts and techniques to achieve behavioural goals, integrating a clear focus on the individual whilst at the same time addressing wider influences and determinants. The approach draws from health psychology, for example, Social Cognitive Theory and Stage of Change Model and social research theory with the specific aim of actual behaviour change³².

Over the past months I have been raising awareness of the potential benefits of using this approach within Public Health, which lead to my line manager buying into the idea and agreeing to fund a place for me on a 2-day Social Marketing course. My aim is to further influence the PCT in adopting a culture change by embedding social marketing within the organisation. In order for this to happen I believe that it is imperative to gain buy in from senior level management. In the near future I plan to organise a one-hour meeting for senior level management to introduce the concept of social marketing, commissioning Brilliant Futures (training providers) to deliver a presentation followed by a questions and answers session.

Planning and delivery of a local obesity conference

I felt that it was important to raise the profile of obesity in Haringey and the need to tackle issues of overweight and obesity at a local level. I decided that a local obesity conference would be an effective means to achieve this. A further aim of the conference was to raise awareness of the support available to health care professionals in their work, including the care pathway,

³² Rayner, M. (2007). *Social Marketing: How might this contribute to Tackling Obesity? Short Science Review. Foresight Tackling Obesities: Future Choices*. Obesity reviews, 8(s1): 195-199.

strategy, resource pack, general resources and training opportunities. The conference was also used as an opportunity to gather views on the strategy and to raise awareness of the 2-week consultation.

After establishing the aims of the conference I then planned the programme in light of key issues and begun to think about who to invite as guest speakers. From experience it is difficult to engage with primary health care professionals, especially GPs to attend such events. It was, therefore, important that the keynote speaker and other speakers were credible and knowledgeable within their areas of expertise. A representative from the Department of Health agreed to deliver a presentation on the Government's obesity programme of work. I organised a half-day conference and the programme consisted of the following sessions :-

Keynote Speaker – Government's agenda to tackle obesity

Haringey Obesity Strategy

Haringey Healthy Schools Programme – a Whole school approach

Obesity Care Pathway

Workshop on Obesity Care Pathway

Sport and Physical Activity – The Big Picture

Department of Health Physical Activity Care Pathway

Local interventions to address Overweight and Obesity

Training opportunities to support local practice

Due to the financial constraints within the PCT, several pharmaceutical companies who have links with the Nutrition and Dietetics Department were approached to part-fund the conference, namely the refreshments and to

make contributions to the delegate packs which consisted of a range of useful resources including the obesity strategy, Obesity NICE Guidance³, physical activity resources, a range of diet and nutrition resources including tools to assist clinicians in measuring obesity, for example, body mass index calculators and tape measures for calculating the risk of cardiovascular. In return for their contribution they were invited to attend the conference as per PCT guidelines.

Reflection

Initially, I was not completely comfortable with pharmaceutical company involvement with the obesity conference, which can sometimes be viewed as controversial. However, pharmacotherapy can play an important role in obesity management in line with guidelines, for example from NICE. In addition, as long as the PCT does not promote one brand of pharmacotherapy over another and adheres to the PCT guidance, there is no reason not to work in partnership with pharmaceutical companies. Upon reflection, I felt their presence at the conference was positive, in the fact that clinicians could learn more about the role of pharmacotherapy in obesity management during the break times, which complemented the aims of the conference.

As the lead for obesity, it was my role to Chair the conference. Despite feeling confident in public speaking and in delivering presentations at both local and national levels, I was very apprehensive about taking on this role as this would be a new experience for me. However, once I got started I soon relaxed into the role.

Evaluate the impact of the conference

The conference was well attended and evaluated positively. The evaluation revealed that the programme content was relevant for the needs of the

delegates and that the presentation delivery by the speakers was of a high standard.

Obesity Strategy and Care Pathway Approval

All strategies and care pathways must be approved by the PCT. This approval process in Haringey is undertaken through the Haringey Professional Executive Committee (PEC). The Haringey PEC is made up of the PEC Chair, PCT Chief Executive, GP representatives and other Directors within the PCT and Council. The PEC has delegated powers from the PCT Board, is made up of mainly clinicians. The members provide valuable clinical insight into decision-making processes and are responsible for ensuring that high quality, safe clinical services are provided to the community it serves and. It also advises and supports the PCT Board in developing strategy and local healthcare plans in addition to having an evaluation, performance monitoring and scrutiny role.

In July 2007 I had completed the Obesity Strategy in draft form and requested for it to be placed on the PEC agenda for discussion. Unfortunately the meeting was cancelled several times or removed from the agenda due to a high volume of urgent items needing to be addressed. It was eventually timetabled to be addressed at a PEC meeting on 23rd January 2008.

I was not required to make a formal presentation as papers for the PEC were circulated to the Committee prior to the meeting for review. However, I gave a brief overview of the aims and objectives of the obesity strategy, in addition to progress to-date with regards to the implementation of the strategy. I also opened up a discussion on the obesity care pathway and obesity care resource pack for health professionals.

Reflection

The strategy, care pathway and resource pack were well received by the Committee and no issues were raised. I was commended on this piece of work and the strategy was formally agreed. Several days after the meeting I received an email from the Acting Chief Executive of Haringey TPCT to say that she had received positive feedback from the PEC Chair regarding the work that I was undertaking in this area. In the following days, this message was also fed back to me through my line manager from discussions regarding the strategy and obesity at a Board meeting. This feedback was very welcome and greatly contributed towards improving my self-confidence in general and specifically in public speaking within high-level forums.

I was initially disappointed that I had received little feedback following the obesity strategy 2-week consultation period. However, upon reflection I feel that this may have been because the strategy was generally well across a range of partners and within the PCT as evidenced above.

I was quite apprehensive about attending the PEC meeting to present the Strategy due to the high level of this Committee. However, despite this I was made to feel comfortable, particularly by the PEC chair.

Conclusion

Developing the Obesity Strategy was a self-taught exercise and a learning curve. However, this provided me with a unique opportunity to further develop myself as a Health Psychologist, and to use and develop a range of skills including my teaching and training, influencing and research skills, in addition to making improvements in my public speaking. Developing the obesity strategy, care pathway and resource pack was a major piece of work. My experience of undertaking this task was both challenging and rewarding and I felt a great sense of achievement once it was complete. It was extremely stressful at times, for example, in the time it took to obtain strategy approval

and in the planning of the conference. Having successfully completed this piece of work, I now feel confident in my ability to develop strategies in the future.

Unit 1 – Case Study

Generic Professional Competence

Introduction

I will describe and reflect upon my professional practice as a trainee health psychologist over a two-year period within my current substantive post and through working as a consultant on various projects for the Department of Health, the National Social Marketing Centre at the National Consumer Council and various London-based Primary Care Trusts (PCTs). I will also reflect upon how I have developed professionally as an applied health psychologist. This will include an account of how I have developed a range of skills in the areas of teaching and training, successful bid/proposal writing, conducting research and in applying psychological principles to areas of my work. I will also demonstrate how I have provided psychological advice and guidance to others, provided feedback to others and how I have implemented and maintained systems for legal, ethical and professional standards in applied psychology.

Background

I have been employed by Haringey Teaching Primary Care Trust since July 2005, initially employed as the Lead for Obesity and Physical Activity within the Public Health Directorate at a Band 7. My main responsibilities were to lead on these two areas and to develop and implement the physical activity and healthy eating action plans outlined in the Governments 'Choosing

Health' White Paper. In October 2006, following a department re-organisation, my role changed to Public Health Strategist for Long Term Conditions and the post was re-banded to a higher grade, a Band 8a. Within this role I take the strategic lead for Long Term Conditions, including physical activity and obesity. My work broadly involves leading on the strategic development and implementation of the preventative aspects of the 'Choosing Health' agenda and National Service Frameworks, in addition to having a remit around working with a range of stakeholders to develop care pathways and strategies. The commissioning aspect of my role involves giving specialised advice and expertise on the commissioning of evidence-based health improvement services and public health programmes.

Implement and maintain systems for legal, ethical and professional standards in applied psychology

Whilst working as a trainee health psychologist I have consistently followed ethical and professional standards, for example, when carrying out consultancy work for Lambeth PCT Stop Smoking Service. I was contracted to carry out a qualitative piece of work, to assist the service in better understanding the support required by quitters to achieve longer-term abstinence. I ensured that I stored the audio tapes securely, and when analysing the data and writing the report, ensured that participant confidentiality and anonymity were maintained (see Appendix C6 – IPA analysis report).

I was also successful in achieving Central Office of Research Ethics Committee (COREC) and NHS management approval for my research in May and June 2007 respectively. In addition, over the past two years I have maintained reflective and supervision logs documenting my practice.

National Child Measurement Programme (NCMP)

I was responsible for leading on the first year of the NCMP, a shared programme between the Department for Education and Skills and the Department of Health (DH), which involves all children in Reception and Year 6 having their height and weight recorded to inform local planning and delivery of services for children to address overweight and obesity issues. A further aim of the programme is to collect population-level surveillance data to allow analysis of trends in growth patterns and obesity. My role was to co-ordinate the programme, which involved developing a proposal setting out the rationale for the measuring programme, and scoping of the staffing and equipment costs. I also set out the DH guidelines for measuring children for use by the school nurses, detailing the requirement to conduct measurements sensitively, in a private space and in a manner which avoids the possible stigmatising of children. It also included guidelines on how to correctly record the data electronically and in the correct format to enable an analysis to be carried out. It was also my responsibility to write to all Haringey parents/carers and Head Teachers, which was signed off by the Director of Public Health, outlining the purpose of the programme. A further responsibility was to ensure that the data collected was uploaded onto the DH National database, and involved working closely with the Public Health Information Analyst. I was also responsible for ensuring that all data collected was anonymised, collected on encrypted data sticks and stored securely, in accordance with the Data Protection Act. This piece of work involved working closely with personnel from the local authority, the Healthy Schools Programme, head teachers and school nurses.

Upon introducing the NCMP to the school nursing services there was initial resistance as they felt that taking on this work would overburden their service due to recent cuts within their service. This was overcome by first acknowledging their capacity issues and then discussing in detail the importance of the programme and how it could, in fact, support, complement and guide their health promotion activities. I also pointed out that the data

would be used to help identify where services and resources may need to be targeted locally and that data would be made available on a school level basis following the analysis. The school nursing service agreed to lead on the NCMP programme and have been for the past three years.

A number of head teachers were anxious that the programme might result in overweight children being stigmatised and were not keen for their school to take part. I resolved these issues by speaking directly with school head teachers, discussing their concerns and clearly outlining the need for the programme. I also clarified the protocol for conducting the measuring, for example, in assuring them that children would be measured privately, that the programme was not for screening purposes and that individual results would not be shared with neither child nor teacher and that measuring would be conducted sensitively by the school nursing service. Only one school opted out of the programme.

To ensure that I was adhering to professional standards, whilst leading on a healthy eating initiative, I sought advice from the local ethics committee to determine whether ethical approval was required for evaluating the project. As non-NHS participants were not being used this was not deemed to be necessary. Despite this, I ensured that in conducting the evaluation that legal, ethical and professional standards were adhered to.

Contribute to the continuing development of self as a professional applied psychologist

Over the past two years I have continued to develop as an applied psychologist. I have attended a series of City University health psychology doctorate workshops, including teaching and training, counseling skills for health psychologists, systematic reviews, generic and professional skills for health psychologists and psychometrics for health psychologists, which I feel

have enhanced my professional development. These sessions encouraged me to reflect upon my practice as a health psychologist which often led to a change in my practice as outlined in examples given later on within this paper. Sharing experiences with my peers on the Doctorate programme has also helped me to develop professionally, both formally within workshops and on a more informal basis. I have also attended numerous conferences and training courses/workshops and events which have enabled me to further enhance my knowledge and to develop a range of my skills, for example, in the areas of social marketing, bid writing, project planning and obesity.

Publications

During one of the Doctorate workshops at City University it was brought to our attention that the BPS Health Psychology Update Journal were keen for trainees to submit articles detailing their experience of undertaking stage II health psychology training. Two fellow trainees suggested that we write a joint article on our experiences of undertaking the Health Psychology Doctorate at City University. The article was published within the Volume 16, Issue 4, 2007 in the special issue entitled *Teaching and Training of Health Psychologists*. This was my first publication and although it was not an academic article, it provided me with the experience of submitting to a Journal and having the article accepted, which in turn boosted my confidence and has inspired to submit an academic paper in the future.

A further opportunity for a publication arose in February 2008. I was invited to collaborate with two other motivational interviewing trainers (one an occupational therapist and the other a linguist) in writing a chapter for a book entitled 'Health Behaviour Change for the Dental Practice', a book edited by Christoph Ramseier and Jeanie Suvan. The chapter was entitled *The Challenge of Behaviour Change*. The book was being written as a practical guide to assist practitioners in addressing the complexities of behaviour change in the area of dentistry. I led on writing the section covering models and theories of behaviour change. This piece of work spanned over eight

months. This was a challenging experience for a number of reasons. Firstly, the chapter content and format had to be agreed upon and this was not always an easy process when agreement had to be made between three people. However, agreeing on who would lead on the different sections went smoothly. Once the three sections had been written, the writing style of the chapter, influenced by the other chapters written, had to be adapted. This was an intense piece of work, one which required regular contact with the co-writers of the chapter. This was achieved largely through regular email contact and a few face-to-face meetings. I feel that the experience and skills gained from writing this chapter have been invaluable and transferable. The book is due to be published in 2009.

I continue to develop as an applied psychologist. Following my attendance on a two-day introduction to social marketing training, to further develop my knowledge in this area, I have enrolled onto a social marketing scoping masterclass. The workshop is a practical course designed to enable participants to conduct or commission research to build insight into target audiences and learn how to use these to engage with hard to reach groups.

Developing my skills as a consultant

In July 2007 I decided to set up a company, which I named Innovative Health Consultancy Limited, through which I have delivered health behaviour change and physical activity promotion training for numerous London-based PCTs. I have also worked as a consultant for a DH initiative on a piece of work commissioned to the National Centre for Social Marketing (NCSM).

Let's Get Moving Brief Intervention Video Demonstration

Due to my prior appointment as consultant to provide training for a pilot physical care pathway developed by the Department of health, I was approached to work in my consultancy capacity to develop a demonstration video. The video was developed to demonstrate the Let's Get Moving (LGM) resource pack within the context of the physical activity care pathway for use

within a series of focus group evaluations, to contribute towards the evaluation of the pilot LGM resource. The physical activity care pathway is a brief primary care behaviour change intervention to support insufficiently active adult patients to increase their physical activity levels with the aim of improving their health and well-being. I was contracted as a consultant to prepare four 20-minute scripts to simulate two initial and follow-up physical activity consultations using Motivational Interviewing within the context of a physical activity care pathway and using the LGM resource pack. The LGM resource pack was developed to support the physical activity care pathway that was developed by the DH. Other outputs included acting as the consultant/director in the film recording to ensure that the role plays were enacted appropriately, assisting in casting actors to role play the patient and an MI practitioner to act as the clinician, setting the filming context (ie. the filming set) and active involvement in post editing to ensure that the key messages of the brief intervention were accurately portrayed and reflected an actual initial and follow-up consultation.

This was a very exciting and challenging piece of consultancy. The timeframe was very brief, spanning some 4 weeks from start to finish. This was my first experience of undertaking this type of consultancy, but I felt fairly confident in my abilities given my training background in the area of Motivational Interviewing and my experience in leading simulated exercises when delivering training. I feel that despite my lack of experience in undertaking this type of consultancy that I dealt well with the challenges I faced. For example, during editing sessions with the project lead from the NCSM and the producer, agreement had to be made regarding the editing of the recordings to ensure the portrayal of the MI approach was not lost. I also feel that with more experience in this area, and having attended the City University Doctorate workshop on consultancy, that I am now more able to cost requests for consultancy more appropriately and was very pleased that I did not underestimate the time it would take to carry out the consultancy for the NCSM.

Since 2007 requests for consultancy have expanded through word of mouth, without the need to advertise. For example, in September 2008, through a recommendation, I was approached by the Midlands Health Psychology Network to deliver a one-day workshop on Motivational Interviewing for their members, namely chartered health psychologists, trainee health psychologists and clinical psychologists. This will be my first experience of delivering training to other psychologists and I am looking forward to delivering this workshop. I will be delivering the workshop in December 2008.

My experience in delivering training has largely been for health care professionals. However, in June I delivered a one-day health promotion workshop and a half-day motivational interviewing workshop as part of a training programme for Health Trainers for a London PCT. From this experience I learnt that when training different audiences that the delivery style needs to be adapted to meet the needs of the participants.

In October 2007 I delivered a lecture at City University on an MSc Health Psychology programme as part of their Health Promotion module. The lecture was entitled "The development and delivery of a health psychological intervention" and focused upon the practical issues associated with developing a health psychological intervention, eg. submitting a bid for funding, designing the health intervention, evaluation, working as part of a multi-disciplinary team.

My experience of delivering this lecture was positive and I would like to deliver further training to students in the future.

My confidence has increased as I have worked more regularly within a consultancy role and once I complete my Doctorate I aim to continue to gain more experience within this area.

Provide psychological advice and guidance to others

Guidance for behaviour change were published by National Clinical of Excellence (NICE) in October 2007. In March 2008 I was asked to present the guidance to the Clinical Effectiveness Group and to identify gaps in Haringey which led to my recommendation of recruiting a role to lead on this area.

In addition, I have provided psychological guidance to the DH in their development of a pilot Physical Activity Care Pathway, the North Central London Obesity working group in the development of an obesity care pathway and resource pack and in the development of an Obesity Strategy for Haringey.

Commissioning

In recent years, PCTs have been moving towards the commissioning of health services. My first experience of commissioning services was when leading on a Food Standards Agency (FSA) project, following the submission of a successful bid to them. This involved developing a tender invitation and service specification to commission the evaluation of the project. The direction of the NHS is that many more services will be commissioned in the future and I envisage that my work will evolve in this area. In some cases this will require me to provide psychological advice to others, in addition to using my knowledge in health psychology to inform tender specifications that I will be responsible for developing.

I currently sit on an obesity steering group and had input into writing a tender invitation and service specification for the development a toolkit for London PCTs to develop children's obesity care pathway, a piece of work which was led by the Regional Food and Obesity Programme Manager. This group is also responsible for monitoring and overseeing this work. My involvement in

this work has improved my understanding of the area of commissioning which is a fairly new concept within the NHS.

Lessons learnt

During the two years of my training one of the key lessons learnt was in the area of conducting research. I trained exercise practitioners to deliver the intervention I designed for my research, a randomised controlled trial. I also appointed a project co-ordinator who was responsible for the day-to-day running of the intervention. Several months into the intervention it became apparent that data was being wasted and that the intervention was not being conducted according to the research protocol and the appropriate paperwork was not being collected. This has led to a delay in the completion of my Doctorate. However, this was remedied following meeting with my research supervisor in September 2008. What I would do differently following this experience would be to manage more closely the individual responsible for the day-to-day management of the data and having a more 'hands on approach' from the inception of the research. As the research is still ongoing I now have regular weekly meetings with the co-ordinator to ensure that the data collection process is running smoothly and to ensure that I am informed of any wastage, in addition to discussing other aspects of the intervention.

Teaching and Training

My teaching and training skills have developed over the past two years. I believe that my skills in this area have improved greatly following attendance at a Teaching and Training workshop through the Doctorate programme. I learnt that detailed planning is required, in the form of a lesson plan, when delivering training in addition to the need to set clear aims, objectives and learning outcomes for each component of it, a practice that I have now fully adopted. Prior to attending the workshop when delivering training I found that my failure to plan in detail often led to me running out of time, which resulted

in me having to rush through the delivery of some components of the training. However, having changed my practice, I no longer experience this.

General

Over the past two years I have put much effort into promoting health psychology within my Department and amongst a range of health professionals, in highlighting the contribution health psychology can make to health practice, health-related research and policy. This has led to an increased interest in psychology and motivational interviewing within my organisation, other PCTs and within the DH.

Further skills I feel I have developed include my influencing skills, for example, in 'selling' the concept of social marketing at an organisational level. It was brought to the attention of the Assistant Director of Development that I had attended training within the area of social marketing. An impromptu meeting took place where I gave an overview of the approach. Following this meeting it was agreed that when funds were available a social marketing workshop would be arranged for top level management to attend in order to ensure that the PCT would adopt social marketing as an organisational approach. In addition, my skills in bid writing and my confidence in public speaking, for example at high-level meetings and delivering presentations have improved.

Conclusion

Having consolidated my learning over the past two years, I feel more self-confident in my ability to work unsupervised as a health psychologist once my training period ends. I also feel that I am more reflective in my practice which has resulted in me adapting the way that I work based on this process, which has resulted in me developing into a more skilled and effective applied psychologist. As my confidence has grown, I feel that I am now more

proactive, for example, in seeking opportunities to apply psychology to relevant areas of health within the NHS and also in opportunities to work within a consultant capacity in areas where I am competent.

My two years as a trainee health psychologist have made me think about how health psychology can be applied when undertaking my role as Public Health Strategist for Long Term Conditions. I feel that I have been fairly successful in raising the profile of health psychology across the PCT, which has been reflected in securing monies via the PCT's commissioning intentions process, for example, in securing funding for a post to lead on behaviour change to ensure NICE guidelines are being implemented and monies to develop a Health Trainers programme. In addition, I have been successful in raising the profile of health psychology and health behaviour change both locally and nationally. For example, the DH physical activity care pathway has been positively received and has received much interest, in addition to the interim results being positive. As a result the pathway will be rolled out nationally from April 2009. The roll-out will involve the DH developing a toolkit for PCTs on how to commission this service. This will include training requirements for staff to deliver the training which will be based on the training developed for the pilot waves which I delivered. I was also instrumental in highlighting and putting forward the rationale for the need to train health professionals in the area of communication skills in order for the care pathway to be implemented successfully.

I have gained experience in working within multi-disciplinary teams, including dieticians, nutritionists, GPs, practice nurses, school nurses and mental health workers which is important when working as an applied psychologist.

My experience of working as a trainee health psychologist over the past two years has been both challenging and rewarding and I look forward to working as a health psychologist within a Chartered capacity in the near future.

Lambeth Stop Smoking Service

An exploration of the support required to achieve long-term abstinence: An Interpretative Phenomenological Analysis

BACKGROUND

General

Smoking is a major public health concern and a leading cause of ill-health and premature death in the UK. A key objective of the Choosing Health White Paper (2004) is to reduce adult smoking prevalence from 26% in 2002 to 21% or less by 2010, with a reduction in prevalence among routine and manual groups from 31% in 2010 to 26% or less.

Lambeth is amongst the most deprived areas nationally, with 16 out of 21 wards being amongst the top 20% most deprived wards in England, with all wards having higher than average deprivation (LHO, 2008). Lambeth's population is ethnically diverse, with over 150 languages spoken across the borough. Black and Minority Ethnic (BME) groups account for 35% of the total population, of which Black Caribbean and Black African groups form the majority of 26% of the total BME population.

Smoking in Lambeth

Life expectancy is lower compared to the England average and death rates from smoking appear to be higher than the rest of England (LHO, 2008). Smoking is recognised as the main factor causing the difference in life expectancy between Lambeth and England as a whole. The smoking prevalence rate in Lambeth is 35%, 10% higher than the national average

smoking prevalence rate. Higher rates of prevalence are evident in some Black and Minority Ethnic (BME) groups. The Health Survey for England (2002) revealed that the prevalence of smoking amongst Black Caribbean men and Irish men was 35% and 39% respectively. In Lambeth, between 37% and 43% of deaths in people aged over 35 years are smoking-related. Smoking is higher amongst men and women of low socio-economic groups who are also less likely to stop smoking (HDA, 2005).

Evidence suggests that longer-term abstinence from smoking will provide longer-term beneficial impacts on improving health and well-being (Quit, 2007). A local baseline of 52-week quit rates was collected in 2007 of individuals registered on the Stop Smoking Service database as a 4-week quitter. The results revealed that 15.4% of individuals remained quit at 52 weeks after their quit rate. Based on these findings, a 52-week quit target of 262 individuals to have remained smoke-free was set for the 2007/2008 financial year.

The aim of the qualitative study was to gain an in-depth insight into the support required by smokers to help them to achieve long-term quit status (remaining abstinent at 52-weeks after their quit date) from the perspective of pharmacists and practice nurses providing stop smoking services within Lambeth. It was originally envisaged that data would be collected through conducting a focus group with service providers. However, due to low uptake, it was decided that data would be collected through conducting a series of semi-structured interviews.

METHODOLOGY

The study took place in May 2008.

Participants

Approximately fifteen smoking service providers were invited to take part in the study through an invitation letter sent by the main Stop Smoking Service. Four participants were recruited, namely three pharmacists (2 male, 1 female) and one practice nurse (1 female).

Procedure

Brief semi-structured interviews lasting approximately 20-25 minutes were conducted with each participant. The author conducted two of the interviews and the Stop Smoking Advisor conducted the remaining two. Two interviews took place at the Lambeth Stop Smoking Service offices at the Moffat Clinic and two at pharmacy shops.

The interviews were conducted to gain an insight into the participants' beliefs and attitudes regarding the support required by smokers in helping them remain abstinent in the longer-term.

The interviews were audio-taped with the participants consent and later transcribed verbatim, providing the data set for an Interpretative Phenomenological Analysis. Consent to participate in the study was obtained by the main Stop Smoking Service prior to the interviews taking place.

Interpretative Phenomenological Analysis (IPA)

IPA is a relatively new and developing qualitative approach being used in the area of psychology in an attempt to understand participant's personal view of the phenomena being investigated, rather than attempting to produce an objective record of an event or state (Smith and Osborn, 2003). It recognises that the researcher cannot directly or completely access the participants' lived experience, and that access to these thoughts are through a process of interpretative activity which will be influenced by the researchers own perceptions, which are required to make sense of the participants' personal world (Smith, 1996; Willig, 2001).

IPA's methodology adopts a systematic approach involving methodically working through a transcript in order to identify themes and categories.

They are progressively integrated until master themes are established that capture the essence of the phenomenon of interest, using categorisation in order to achieve systematic data reduction (Willig, 2001).

Interview Format

Prior to the commencement of each interview, the purpose of the interview and issues of confidentiality and anonymity were discussed with each participant. Participants were informed that they were free to terminate the interview at any stage.

The author used open-ended, neutral questions to allow the participant to speak freely and to reveal any associated thoughts and feelings about their personal experience of helping smokers to quit and to explore in detail the forms of support they felt were helpful to ex-smokers in helping them to achieve 52-week quit status. The author used as little prompting as possible to avoid leading the participant in any direction. There was minimal

intervention on the part of the author, except for affirmations and the occasional use of probing questions where the participant's response was not sufficient, in order to elicit a satisfactory response. Participants were given the opportunity to add to their account anything that had not been addressed or that they wished to expand upon.

The interview schedule consisted of an opening statement followed by six questions and probing questions for use if necessary, as follows:-

Opening: "We are interested to find out what forms of support you feel are helpful to ex-smokers, who have achieved 52-week quit status, in helping them to remain abstinent".

Introductory Question:

Can you tell me about your personal experience of helping smokers to quit?

Question 1: Based on your experience, are there any aspects of the Stop Smoking Service/programme that you think particularly help smokers to remain abstinent in the longer-term?

Probe: In what ways does the Service/programme make a difference?

Can you tell me more about this?

Anything else?

Question 2: Are there any aspects of the Stop Smoking Service/programme that you feel are less effective in helping people to remain abstinent in the longer-term?

Probe: Can you tell me more about this?

Anything else?

Question 3: In your opinion, are there any factors outside of the Service that help people remain abstinent in the longer-term?

Probe: Can you explain further?

Anything else?

Question 4: With regards to ease of access to the Service, in your opinion, are there particular groups of people for which access might be an issue?

Probe: Can you tell me more about this?

Anything else?

Possibly life events or support from others (**NB. This probe will only be used if I experience difficulty in eliciting a response from participants**)

Question 5: What methods do you use now that you feel help people remain abstinent?

Probe: Has anyone tried any different methods?

Can you tell me more about this?

Anything else?

Question 6: What would you do differently, if you had infinite resources, that you feel would help smokers remain abstinent in the longer-term?

Probe: Can you think of any other methods you could use?

Close: Interviewer will ask the participants to consider a summary of key points from the discussion or to identify the most important aspects in relation to the topic, for example:-

“Of all the that were discussed, which one is most important to you?”

Probe: “Have we missed anything?”

Analytical Process

The author carried out the analysis as detailed below:-

- Stage 1: The interviews were transcribed verbatim and read several times in their entirety, and notes made about any statements that appeared interesting or significant.
- Stage 2: A summary of the author’s initial encounter with the text, and a list of emergent themes and categories were produced for each interview.
- Stage 3: The themes identified in stage two were examined further to look for connections between them, which if found were then clustered together and re-labelled.
- Stage 4: A summary table of the themes for each interview was produced, detailing where in the transcript instances of it can be found.
- Stage 6: The summary tables of the themes for each interview were then examined together as a whole data set, and a consolidated list of themes for the four transcripts was produced to obtain an amalgamated representation.

To maintain confidentiality and anonymity, participants have been identified as participant 1-4 with profession specified.

RESULTS

The interviews produced a large amount of rich data, from which four key themes emerged; success in the advisor role, service barriers, programme efficacy and support. The recurrence of these themes across the interviews suggested similar shared experiences amongst the service providers.

Success in the Advisor Role

Participants expressed a strong commitment to their role as stop smoking advisors and considered it to be an integral part of their routine work, and based on their comments, appeared to value it as an important health intervention. Participants reported that their overall experience of working as a Stop Smoking Advisor had been positive. One participant gave an example of when she had been successful in helping a client to quit smoking.

“I mean, it’s really good because a lot of them do come back to the pharmacy and I will say, how are you doing. And the last one came to me, he finished with me 6 months ago and he still has not touched a cigarette”.

(Participant No. 2 – Pharmacist)

For one participant, it was felt that to a large extent the age of the client determined his success as an Advisor.

“I think.....I do find that if they are very young they tend to be the ones who are most likely to fail. I have got quite a few actually who are about 18, 19 and even 20. But I find that the failure rate is so high with them”.

(Participant No. 3 – Pharmacist)

Other participants described their feelings about their perception of their success within their role, with one participants' account revealing a certain degree of ambivalence in that the role was both 'fulfilling' and at the same time often 'disappointing' when clients were unsuccessful in their quit attempts.

"No, I have found it very fulfilling. There are a lot of people who fail first time around and that is disappointing, but they are more disappointed for me than they are for themselves [laughs]."

(Participant No. 1 – Practice Nurse)

The accounts of the participants indicate a common interpretation of the health professional's perception of their success in the role of Stop Smoking Advisors. Participants felt that their success was largely determined by their client's readiness and motivation to stop smoking.

"It very much depends on making sure that they are motivated in the first place".

(Participant No. 1 – Practice Nurse)

In addition, their accounts suggest that they respected client autonomy, in that despite all efforts from Advisors, the decision to change smoking behaviour lies with the client ultimately.

"...there is a lot you can do but I think it has to come from them, and I think I believe a lot in self-efficiency. You know, that they have to be self-sufficient, and they have to want to do things.....Especially if....if

they want to do it for themselves and they are ready to stop smoking then it has actually been quite successful”.

(Participant No. 2 – Pharmacist)

“But, you know, in the end it is their decision”

(Participant No. 1 – Practice Nurse)

“So I think.....erm.....they have to decide to give up smoking first.....I think it is really down to the individual”.

(Participant No.4 – Pharmacist)

The participants felt that a firm knowledge base was an important factor, which determined the competence and success of Advisors. It was strongly expressed by two participants that success in the Advisor role was dependant upon their skills and knowledge in the area of smoking cessation.

“I mean, it would depend on the knowledge of the person who is offering the support”.

(Participant No.1 – Practice Nurse)

This was echoed by a further participant:

“And then, of course, it’s very important that who they see is trained and competent and that, you know”.

(Participant No. 2 – Pharmacist)

Service Barriers

In response to the question concerning ease of access to the Stop Smoking Service provided by the participants and whether they felt that there were any particular groups of people for which access might be an issue, all participants described a range of perceived barriers to access.

It was strongly felt by three participants that the Stop Smoking Service failed to adequately cater for the needs of the working population due to limited opening hours.

“There are clearly issues because the Surgery is only open from maybe 8.30am in the morning through to about 6.00pm-6.30pm which covers the working day and I am acutely aware that, erm, that does make it difficult for anybody who is working”.

(Participant No. 1 – Practice Nurse)

This concern was voiced by two further participants:

“I think some office workers have a problem trying to get out in time, I think so. You know, they have a very short lunch time period. Teatime they can never really get out.....”

(Participant No. 3 – Pharmacist)

“I think those who have work, since we only open from 8.30am to 6.30pm. Erm, they might not be able to come within our opening hours”

(Participant No. 4 – Pharmacist)

However, participant No, 4 then contradicted the above in stating that he felt people seriously committed to quitting would endeavour to overcome this barrier regardless.

“.....but I think this is only an excuse. I think if they really want to they can. If they want to they definitely can, but..... er..... they make excuses.....you know.....”

(Participant No, 4 – Pharmacist)

Older people with mobility problems or people with disabilities were also identified as a group of people for which access might be an issue.

“.....anybody with a disability and finds it difficult to get to the Practice, because at the moment I do not go out and see people”

(Participant No. 1 – Practice Nurse)

“.....well of course, if you are elderly it is harder because if you can't walk, if there is a mobility issue”.

(Participant No. 2 – Pharmacist)

“I think that there are a lot of disabled people who are smokers. My gut feeling is, those who are in a wheelchair or those who are housebound. I think we need to reach out to them....”

(Participant No. 3 – Pharmacist)

Participant No. 3 went on to comment on a possible solution to the problem of access for housebound individuals. He felt that as relatives/carers of housebound individuals regularly attended the pharmacy on their behalf, that this could provide them with an ideal opportunity to promote the availability of one-to-one stop smoking sessions run by the main service. In an attempt to help address access he suggested that an effective method for doing so might be to issue written information which could be enclosed with prescriptions.

“I feel if we were somehow..... although we get a lot of disabled people’s relatives or somebody coming through.....we could put some sort of leaflet in a bag to say that, you know, you could have a one-to-one session with the counsellor, or I don’t know it might make them think about something”.

(Participant No.3 – Pharmacist)

Three participants viewed pregnancy as a barrier to accessing their service, with one participant stating that it was felt a pregnant women would be far more likely to go to her GP rather than to a pharmacist for support in quitting smoking.

“When pregnant, you find that they wouldn’t normally come to you because even the people that they go to might be slightly apprehensive, because they need to be monitored.....Well in my case they wouldn’t come to the pharmacy because they would go straight to the GP”.

(Participant No. 2 – Pharmacist)

She then went on to state that she felt pregnant women would not access the service because of concerns over the safe use of NRT during pregnancy.

“.....I think it is more because they would not want to use NRT and also because they do not understand whether they can, and that is why they normally go to their doctors. Because if they went to the doctors and the doctors found out they were pregnant the doctor would be the first to give the advice anyway and to point them in the correct direction to give up if necessary”.

(Participant No. 2 – Pharmacist)

Her accounts indicate that she feels clients view GPs as a credible source of information and that they would be more confident in receiving information about health from GPs rather than from other sources.

For all participants it was viewed that age was a barrier to access for young people. One participant’s rationale for this was that young people perhaps feared that their smoking habit may be discovered by their parents and so therefore would not access the service.

“.....so it could be younger than 16 because they are scared of coming over to you because it might be like, it leaks out and my parents find out that I actually smoked”.

(Participant No. 2 – Pharmacist)

It was also suggested that language may be a further barrier for accessing their service.

“There is another group I think who maybe have difficulty and that is the language.....For example those who can’t speak English, like,

erm, Asians, Easter Europeans, Portuguese. There might be a little bit of language problems and they might shy away from coming here”.

(Participant No. 4 – Pharmacist)

This view was shared by a further participant:

“.....we haven’t really made a specific effort but there will be people from ethnic origins not speaking the language, not speaking English, where they won’t, they just won’t access our services and we haven’t specifically gone out of our way to get them yet”.

(Participant No. 1 – Practice Nurse)

She then moved on to suggest that her service was perhaps not providing equal access to the local community in that it was being predominantly used by British middle-classed groups and was not being utilised by people from black and ethnic minority (BME) groups. Her account suggests that there was a need to do some specific targeting of this population to increase the usage of the service by them.

“But looking at the figures, it does look as though most of my clients seem to be British. You know, that’s just.....they are the ones that come in. Middle-class British rather than anybody from any other kind of group that feels a bit sidelined really”.

Programme Efficacy

It was generally felt by all participants that the service they provided, its design and content was efficacious as it currently stood.

“I am quite happy with the way it works”.

(Participant No. 1 – Practice Nurse)

“I think as long as they walk through this door they have a chance and.....ahh.....you now, give us the opportunity to help them”.

(Participant No. 4 – Pharmacist)

Three participants commented that the fact that the service was free assisted in helping their clients to remain abstinent in the longer term.

“And I think also because it is free. I think that makes a real big difference because they are thinking, well hold on, I really want to give

up, the NRT is free and I am able to see a specialist on a weekly basis.....”.

(Participant No. 2 – Pharmacist)

“Erm.....there was always this problem before between payers and non-payers. I feel that issue has been resolved now.....I think they always used to feel that, umm, well, I have to pay so.....that was the negative part of the campaign...but that’s actually been resolved now, that’s a positive part of the campaign now.”.

(Participant No. 3 – Pharmacist)

“.....giving them the treatment free of charge is another good encouragement”.

(Participant No. 4 – Pharmacist)

He then went on to voice his uncertainty as to whether the service is in fact effective in helping clients to remain abstinent beyond the 12 week period that they are seen within the service.

“You think they have stopped smoking for 12 weeks, is it very likely that they will continue? Don’t have any record of that”.

(Participant No. 4 – Pharmacist)

All participants felt that the use of NRT and other stop smoking medication improved smoking abstinence over the longer term, with some giving examples of how they have supported clients using a secondary NRT product.

“I still like, erm, the nicotine patch used with another form of...often used with another form of NRT. Partly because there is flexibility to carry on at a lower dose..... you have the flexibility to carry on for longer, to give them that crutch for a little bit longer....that is probably the best, the most effective option that I have used.”

(Participant No. 1 – Practice Nurse)

“One thing I think helps is the fact that we can provide more than one type of NRT”.

(Participant No. 4 – Pharmacist)

One participant commented on the efficacy of Champix in helping smokers to quit smoking in the longer term, and discussed the potential value of Advisors being able to prescribe it for their clients.

“I think maybe, you know, for us to prescribe Champix.....we do have quite a few people on Champix.....and.....er....a lot of them have a very good response”.

(Participant No. 4 – Pharmacist)

In contrast, participant No. 1 voiced her disappointment in Champix in that she felt it was going to enhance abstinence rates, but in fact has experienced that many of her clients have suffered serious side effects from the drug. In addition, her account suggests that that her confidence in her knowledge regarding the drug was somewhat lacking.

“I was hoping it was going to be Champix but I am finding that a lot of people are having unacceptable side effects to Champix and I am not able to, kind of, talk them through that sufficiently.....I’m not as impressed with Champix as I started off thinking that I was going to be.....”

(Participant No. 1 – Practice Nurse)

One participant’s account suggested that the training provided by the core Stop Smoking Service was crucial in ensuring that Advisors were competent and equipped with the skills to facilitate client behaviour change.

“....because if they [Advisors] don’t know what they are doing, and if they don’t know how to help these people.....but of course this is why we have the smoking cessation programme as well”.

(Participant No. 2 – Pharmacist)

Support

Across all four accounts there was a strong consensus that support was the most important factor in effecting positive long-term behaviour change amongst clients.

“I think it is more the, kind of, support that they get is number one that helps them to remain abstinent”.

(Participant No. 2 – Pharmacist)

“I have always thought that, you know, is that....erm..... something to do with moral support would be the answer.....”.

(Participant No. 3)

“The most important thing is the support from the pharmacist and all of the encouragement”.

(Participant No. 4 – Pharmacist)

“I mean there is nothing like being patted on the back and being told that....erm.....actually you have done a great job here, and it’s the best decision you ever made.....”.

(Participant No. 1 – Practice Nurse)

Participants mobilised 'support' in a number of ways. When asked the question of whether there were other factors outside of their stop smoking service that helped clients to remain abstinent, having a strong social support network was a recurring theme to consistently emerge from the data. Strong social support networks and support from significant others were considered by all to be key to successful quit attempts.

"Erm.... support from family and friends, number one. So letting people know that they are going to give up and also when they are trying to give up smoking, for people around them to try and avoid smoking in front of....around them because this is not going to help them give up, number one".

(Participant No. 2 – Pharmacist)

"I think if they have support from their partners and family they are likely to maintain their quitting.....stop smoking.....quitting cigarettes, yeah".

(Participant No. 4 – Pharmacist)

He then went on to give an example of what might occur if a quit attempt was unsupported.

"If one partner continues to smoke they would definitely, you know, encourage the other one to start smoking again".

(Participant No. 4 – Pharmacist)

One participant presented a further example of how a quit attempt may fail in the absence of adequate social support.

“If somebody gives up at the same time. If husband and wife give up together, or two or three friends give up together and they all stay off together, then I am sure that’s certainly, umm, a major.....I have certainly seen the major impact the other way around where as soon as they go back to, umm, you know, a stressful situation or the pub or whatever, where they would habitually smoke, then it is very hard not to”.

(Participant No. 1 – Practice Nurse)

One participant felt that raising awareness and educating the general population about the importance of providing support to people who were attempting to quit smoking would be an invaluable intervention. The approach of raising awareness through posting these messages within GP surgeries was presented.

“So, for example, putting things up like in surgeries, you know, you could have a poster saying, you know, when someone in your family gives up please support them long-term”.

(Participant No. 2 – Pharmacist)

In addition, she suggested that clients themselves would also benefit from disseminating these important messages directly amongst significant others in an attempt to increase their chances of quitting successfully.

“.....get your family to support you. Because you need that support.....you know, you can’t do that on your own. It’s tough”.

(Participant No. 2 – Pharmacist)

In response to the question of what Advisors would do differently to help smokers remain abstinent in the longer-term, offering clients long-term support was considered to be fundamental. Some participants commented that the standard 12-week duration of the smoking cessation programme was too short. Participants also reported that this often led to clients feeling unsupported and 'cut adrift' once the programme had ceased and support from the Advisor ended.

"Pick the patients.....pick the clients [laughs] that are really going to have a good go at it and then support them for that bit longer so that they do not feel cut adrift".

(Participant No. 1 – Practice Nurse)

".....because I think we are leaving them in a shadow aren't we? Once the 12 weeks is over.....".

(Participant No. 3 – Pharmacist)

"I think they also feel lonely"

(Participant No. 2 – Pharmacist)

It was strongly felt that for longer-term abstinence to be achieved, once the programme came to an end, that support from Advisors should continue.

"Yeah, I think, keep in contact with them as often as we can, of course, within reason, maybe once a week, or once every two weeks....."

(Participant No. 4 – Pharmacist)

“I think keeping in contact. Seriously, moral support.....and keeping in contact”.

(Participant No. 3 – Pharmacist)

“I would actually like to see them for a longer period to time to see well, you know, and to ask questions about, you know, are you being helped from outside? How’s it all going? You know”.

(Participant No. 2 – Pharmacist)

One participant felt that the current programme was efficacious and commented that it was important for clients to take responsibility of their own lives.

“.....so I guess the time I spend with them at the moment I feel is probably sufficient. You don’t want to feel that you are forever having to prop somebody up so that they won’t start smoking again. You know, it is truly their life and their decisions and things.....”.

(Participant No. 1 – Practice Nurse)

However, she went on to comment that clients needed varying levels of support based on their individual needs, and given the opportunity, and with more resources she would follow clients up over the longer-term. Follow-ups would be to either address the needs of those who were abstinent but who might be thinking about starting to smoke again, or those who were lost to follow up. She felt that lack of resources was a barrier to her doing this but felt that this would be a worthwhile intervention.

Further on in the interview she gave an example of where this extra support might be useful and how it might help people to re-enter the programme.

“When I look back on it I think there are quite a few, who maybe they came for the first two or three appointments and then, you know, they have clearly not succeeded on that occasion, but there has been no conversation to say, well look, this is what, you know....don’t beat yourself up about this, it happens to a lot of people.....go away, don’t think about it for three months and then we will revisit it. And I think that little intervention may well bring people back into the system quicker. Yeah, that would be what I’d say”.

(Participant No. 1 – Practice Nurse)

Participants suggested a range of support methods that could potentially be effective in achieving abstinence, including support by email, telephone, mail and face-to-face consultations.

“Rather than asking them, why don’t you come here to make an arrangement with us whatever, I think if they always had a number, if we gave them a phone number and said, look if you feel that you might go back to where you started from.....”.

(Participant No. 3 - Pharmacist)

He commented that support via the telephone might not be the most appropriate form of support as there was the danger that this could be perceived by the client as too invasive, going on to suggest that contact by mail might be a better approach.

“I mean, I don’t think phone calls would be the answer, but I think maybe dropping them a line.....in the post, you know, blah, blah, blah....If you feel you need some support....just please either ring the

number or send a pre-paid card back or something like that.....because with a phone call I think they would feel pressurised....but maybe something in the post or an email or maybe a text....that they don't feel that their privacy has been invaded by somebody, you know....”.

(Participant No. 3 – Pharmacist)

One participant felt confident that using emails would be an effective way of providing support for mobile users.

“.....this study that is going on about texts to stop is going to really help in that situation.....I am pretty certain that the group of people who use mobile phones all the time are going to find that really helpful.....”.

(Participant No.1 – Practice Nurse)

In contrast, one participant suggested that Advisors remain in contacts with their clients over the long-term through face-to-face follow-up consultations.

“To remain in contact with them.....long term....over a year. If we can invite them to come here to do....er....a check-up....erm discuss their problems.....”.

(Participant No. 4 – Pharmacist)

Discussion

The purpose of the study was to better understand the support required by smokers to help them achieve long-term quit status from the perspective of stop smoking providers, namely pharmacists and a practice nurse. This study

has contributed towards knowledge in the area of long-term smoking abstinence and support. The findings strongly suggest that according to service providers, providing clients with long-term support might be the single most important factor in improving long-term abstinence.

The participants' accounts suggest that they perceive themselves to be successful within their role as Stop Smoking Advisors. Two participants highlighted the importance of being knowledgeable in the area of smoking cessation, which in turn impacted on their success as Advisors. It was also acknowledged that there was a need for training from the main Stop Smoking Service to ensure that Advisors were equipped with appropriate skills and knowledge.

The IPA analysis revealed concerns amongst some pharmacists and practice nurses regarding service barriers, identifying that the services might not be designed to allow for equal access for particular groups, including older people, pregnant women, people with disabilities and mobility problems, young people and those with English as second language or non-English speaking people. Participants articulated the need to address these issues, giving some examples of how to tackle these barriers.

All participants generally viewed the stop smoking services they provided positively. The main theme to emerge from the data was the need to provide clients with longer-term support. Across all the accounts, participants felt that providing long-term support by various means to meet client needs was probably the most important factor in improving long-term smoking abstinence rates. Based on these findings, if services were to be revised, the data suggests that the provision of long-term support as a means to improve long-term abstinence rates is crucial.

Conclusion

By interviewing four Stop Smoking Advisors, and carrying out IPA on the data, it was possible to explore their views regarding the role of support in improving long-term abstinence. It provided rich data which could be used to help inform any future improvements to the stop smoking service.

A limitation to this study was that only one health professional (practice nurse) from general practice participated. Further research in this area should be conducted with personnel from general practice to explore whether there are any commonalities between the views of pharmacists and health care professionals' working within general practice in the area of support and longer-term abstinence.

A further consideration would be to replicate this study using a larger sample size. Unfortunately, this was not possible as only two participants arrived for the focus group, but agreed to be interviewed individually instead. A member of the core Stop Smoking Cessation Service interviewed two further participants on later dates. However, it is important to note that IPA takes a different perspective with regards to sample size in that the results may not necessarily be representative, but rather provide an insight into the topic being explored with a view to increasing our understanding of it.

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SUPPORT REQUIRED TO ACHIEVE LONG-TERM ABSTINENCE	Practice Nurse Participant 1	Pharmacist Participant 2	Pharmacist Participant 3	Pharmacist Participant 4
Success in Advisor Role	X	X	X	X
Programme efficacy	X	X	X	X
Service barriers	X	X	X	X
Long-term support	X	X	X	X

Section D: Systematic Review of the Literature

Psychological interventions in the treatment of Childhood Obesity

Competence 2.1 – Conduct a Systematic Review

Psychological Interventions in the treatment of childhood obesity

BACKGROUND

Childhood obesity has reached epidemic levels in the UK and is increasing worldwide. In the USA the prevalence of childhood obesity is 12.4%, 17% and 17.6% for 2-5 year olds, 6-11 year olds and 12-19 year olds respectively (CDC, 2003-2006). Obesity has more than doubled in the past 25 years in the UK, and in England approximately 10% of children are obese and a further 20-25% of children are overweight (Canoy et al, 2007). These increases may mean that children of today have a shorter life expectancy than their parents (Reilly et al, 1999). It has been predicted that if appropriate action is not taken, two-thirds of children will be obese or overweight by 2050 (Mcpherson et al, 2007).

Obesity is considered to be a 'lifestyle disease', a result of modern living which has led to the creation of an 'obesogenic environment', one which negates the need for hard physical work due to the introduction of labour-saving devices and the availability of energy dense and cheap food (HM Government, 2008; Foresight, 2007). The main cause of obesity is an imbalance between energy intake (increased food consumption) and energy expenditure (reduced physical activity). Although individuals have a responsibility over the lifestyle choices they make, it is important to consider the complexities of the origin of obesity in that many factors will affect these

decisions. These include genetic, economic, social, psychological, environmental and cultural factors (HM Government, 2008; Foresight, 2007).

In England in 2007, an ambitious target was set to be the first major country to reverse the rising trend in overweight and obesity within the population. The initial focus was on children, to reduce the proportion of overweight and obese children back to 2000 levels by 2020 (HM Government, 2007). No country has been successful in reducing the prevalence of obesity to-date.

An increase in childhood obesity is a major concern as it predisposes to obesity in adulthood (Guo et al, 2002) and is associated with negative health consequences, both in childhood and adulthood (Reilly et al, 2003). The most significant predictor of childhood obesity is parental obesity, which increases the risk of childhood obesity by 10% (Reilly et al, 1999) and with the increasing prevalence of obesity among adults, this public health problem is likely to escalate further.

Both overweight and obesity are associated with an increased risk of numerous health problems including cancer, heart disease, diabetes and other debilitating conditions, which contribute to a reduced life expectancy and impacts negatively upon quality of life (WHO, 2003). Obesity can also cause psychological and social problems, particularly in children. Must et al (1992) reported the findings of a longitudinal study, revealing that overweight in adolescence resulted in increased morbidity and mortality in adulthood, independent of adult weight status.

Being overweight in childhood is also linked to economic outcomes in adulthood. A prospective study found that in female overweight children who were followed up seven years later, they completed fewer years of school, they were less likely to be married, they had lower household incomes and

had higher rates of household poverty than those who had not been overweight in childhood (Gortmaker et al, 1993). In addition, men who had been overweight in childhood were also less likely to be married (Gortmaker et al, 1993). Further studies suggest that obese females complete less years of education, lower numbers of obese students (particularly females) are accepted into prestigious colleges compared to non-obese students despite having equal academic abilities, and are twice as likely to descend in social class through marriage (Stunkard et al, 1992).

The difficulties associated with childhood obesity and the risk of obesity continuing into adulthood have been summarised above, highlighting the urgent need for interventions to treat obesity in children effectively. However, there is a lack of service provision for treating obese children, with less than twenty percent receiving treatment (Denen et al, 1993), and in addition, the evidence of their effectiveness is equivocal. Several reviews have been conducted in the area of treating and preventing overweight and obesity (Glenny et al, 1997; National Heart, Lung and Blood Institute, 1998; Douketis et al, 1999). However, many have mainly dealt with adult populations (National Heart, Lung and Blood Institute, 1998; Douketis et al, 1999). A systematic review carried out by Shaw et al (2005) reported that adults who were overweight and obese benefitted from psychological interventions, and that greater benefits were gained when behavioural and cognitive-behavioural strategies were adopted to enhance weight reduction.

In recent years in the UK a small number of reviews on the prevention and treatment of overweight and obesity have been conducted (NICE Public Health Collaborating Centre 2003 and 2006; Summerbell et al, 2003; Summerbell et al, 2005). Firm conclusions could not be drawn from these review findings in this area, largely due to the poor methodological quality of the studies included (Summerbell et al, 2003; NICE Public Health Collaborating Centre 2003 and 2006). For example, Summerbell (2003) conducted a systematic review to assess the effectiveness of a range of

lifestyle interventions designed to treat obesity in childhood with a minimum of six months duration. These interventions included dietary, physical activity and/or behavioural therapy interventions, with or without support of family members. Eighteen randomised controlled trials with 975 participants were included in the review through searching a range of databases from 1985 to 2001. Five studies investigated changes in physical activity and sedentary behaviour, two studies compared problem-solving with usual care or behavioural therapy, four studies compared behavioural therapy with no treatment of usual care, four studies compared behavioural therapy at varying degrees of family involvement, two studies compared cognitive behavioural therapy with relaxation and one study compared behavioural therapy with mastery criteria and contingent reinforcement. The sample sizes of most studies were too small to have the power to detect the effects of the treatment. The findings suggest that when the main responsibility for behaviour change was given to parents, behavioural therapy may be more effective. It was also reported that relaxation might be as effective as behavioural therapy. In addition, there was some evidence of the effectiveness of interventions focusing on reducing sedentary behaviour. Summerbell et al (2003) summarised that no conclusions could be drawn with confidence as there was limited quality data on the effects of the interventions.

The NICE Public Health Collaborating Centre (2006) conducted a systematic review of the management of obesity in non-clinical settings for adults and children. Databases were searched and included studies published from 1990 to July 2005. RCTs and controlled before-and-after studies examining a range of interventions including exercise referrals, community and setting-based programmes for overweight and obesity, weight management/weight loss camps, and programmes for self-help/management were included in the review. Studies of children aged 2 years and over defined as overweight or obese were included in the review. 35 studies were included in the review. There was little evidence available on interventions to manage overweight and obesity in non-clinical settings, the majority of which were conducted in

schools. Ten non-UK based studies on children were included in the review, seven of which were RCTs involving pre-teen to early teen children. The studies were multi-component but diverse, many of which had methodological problems, were of a short duration and sample sizes were small. No controlled studies were found that examined exercise referral for children. The review concluded that there is insufficient evidence of strategies in non-clinical settings that are effective in the long-term maintenance of weight and long-term improvements in behaviour among overweight and obese adults and children. Three RCTs were carried out on obese children (Jiang et al, 2005) and both overweight and obese children (White et al, 2002; Williamson et al, 2005). The findings suggest that there is some evidence that home-based interventions may be more effective when accompanied by behaviour modification material and ongoing support. No studies targeted young children or older teenagers.

Glenny et al (1997) conducted a systematic review that considered both adults and children. Thirteen randomised controlled trials were evaluated focusing on treatment for childhood obesity. The studies examining lifestyle changes revealed promising results, concluding that interventions aiming to reduce sedentary behaviour appear to be effective for both achieving and maintaining weight loss. However, the findings from other treatment approaches were equivocal.

OBJECTIVES

The aim of this systematic review was to assess the effectiveness of psychological interventions for treating childhood obesity. The definition of childhood obesity within the studies covered by this review was varied, as was those used within the individual studies. Defining obesity in children is extremely complex due to factors such as growth. Currently no universal standards have been set to define childhood obesity, and as a result, numerous definitions are in use in various countries, based on a range of

different cut-off points and reference materials (Guillaume, 1999; Cole et al, 2000).

CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

Types of Studies

Randomised controlled trials of psychological interventions for treating childhood obesity were considered for inclusion. Study duration was defined according to the number of months over which the intervention had been conducted and only included studies with interventions that lasted six months or more. This timeframe refers to the intervention itself or to a combination of the intervention and follow-up phase. The review includes published studies covering a period of ten years from 1998 to 2008 which provided a seven year extension of Summerbell's systematic review (2003) and a three year extension of the NICE Public Health Collaborating Centre (2006) review.

Types of Participants

All studies included obese participants aged between 5 and 17 years at the start of the study period. Participants with long-term conditions, such as diabetes and heart disease, and those critically ill were excluded.

Types of Intervention

All studies were included that provided a description of the psychological intervention used. Physical activity and dietary strategies are often used in combination with psychological approaches to treat childhood obesity. Therefore, studies that used psychological approaches in combination with physical activity and dietary interventions were included in the analysis. Both individual and group therapies were included, in addition to family-based interventions. The inclusion criteria was as follows:-

1. Psychological intervention vs no treatment.
2. Psychological intervention vs different type of psychological intervention.
3. Psychological intervention in combination with physical activity and/or diet vs control in combination with physical activity and/or diet.

Studies using pharmacotherapy, and those which dealt with eating disorders were excluded.

Types of Outcome Measures

Studies had to report outcome measures both at baseline and at post-intervention follow-up of estimates of overweight, namely percentage of overweight and body mass index (BMI).

SEARCH METHODS FOR IDENTIFICATION OF STUDIES

1. The following databases were searched in October 2008 for studies published between 1998 and 2008:
 - (a) EMB Reviews (ACP Journal Club, Database of Abstracts of Reviews of Effectiveness and Cochrane Database of Systematic Reviews),
 - (b) Cochrane Central Register of Controlled Trials (CCTR)
 - (c) EMBASE
 - (d) PsychInfo
 - (e) PsycArticles

(f) MEDLINE

(g) CINAHL

2. The reference list of review articles and all studies included within the review were searched in order to find other potentially eligible studies.
3. Only studies published in the English language were sought.
4. A hand search was carried out in recent editions of the Journal of Health Psychology.

The search terms used are detailed in full below:

obes* OR adipos* OR overweight OR over weight OR over fed OR overfed
OR weight gain OR weight loss OR weight change OR body mass index OR
BMI

AND

child* OR paediatric* OR pediatric* OR adolescen* OR teenage OR young
person OR young people OR young adult OR boys OR girls OR youth* OR
minor OR school children OR schoolchildren

AND

behavio* and behavio* therapy OR behavio* modification OR counsel* OR
cognitive behavio* therapy OR cognitive therapy OR client cent* OR family
therapy OR motivational Interview* OR psychotherapy OR psycho therapy OR
problem solving OR problemsolving OR person cent* OR psycho* OR
psychoeducation OR psycho education OR psychosocial OR psycho social
OR rational emoti* OR solution focused therapy OR therap* OR social support

AND

randomised control* trial OR randomized control* trial OR rct OR rcts OR
random allocation OR controlled clinical trial

METHODS OF REVIEW

Study Selection

An assessment of the quality of the studies was carried out by two reviewers (V. Bogle and J Pearson). Articles were located if the information provided within the abstract suggested that the study might meet the inclusion criteria. To ensure that all potential studies were included within the review, when it could not be determined from the abstract that they met the inclusion criteria, the full article was obtained for further review.

Data Extraction (Appendix D1)

A data extraction form was developed. The data extracted from the studies included the following:-

1. Study author.
2. Study objective.
3. Study design (including method of allocation and number of conditions)
4. Attrition rates.
4. Study participants (demographics)
5. Country.
6. Entry criteria (eg. BMI)
7. Sample size
8. Type of intervention (including the duration, setting and who delivered it).
9. Follow-up points.
10. Outcome measures.
11. Analysis used.

Quality Assessment of Studies (Appendix D2)

Study quality was assessed under two broad headings, namely methodological quality (confidence that the study design, conduct and analysis have avoided or minimised biases in its treatment comparison) and reporting quality (the provided information about the design, conduct and analysis of the study).

The two reviewers assessed the quality of the selected studies independently and compared ratings. If there was more than a 2 point difference in ratings the reviewers met to resolve these discrepancies and agreed on a further rating. The quality assessment tool examined:-

1. Intervention description.
2. Details of randomisation process.
3. Specification of eligibility criteria.
4. Sample size justification.
5. Reporting of response rate.
6. Baseline comparisons between groups.
7. Check for confounding variables.
8. Time range of follow-up points.
9. Reporting of lost to follow-up rates.
10. Relevance of outcomes measures used.
11. Reporting of outcome measures.
12. Appropriateness of statistical analysis used.

The following quality assessment ratings system was followed:-

1. Was a full description of the intervention given? Adequate=3, Partial=2, Inadequate=1
2. Were participants randomly allocated? Adequate=3, partial=2, inadequate=1, unknown=0
3. Were the eligibility criteria specified? Adequate=3, Partial=2, Inadequate=1
4. Was the sample size adequate (100+ participants in each group or sample size established by power analysis? Yes=1, No=0
5. Was the study response rate reported? Yes=1, No=0
6. Were baseline comparisons made between the control and intervention groups? Adequate=3, Partial=2, Inadequate=1, Unknown=0
7. Were checks carried out to ensure that there were no other confounding variables (eg. participation in a diet program or other psychological treatment for weight loss, diet or exercise restrictions, an underlying medical cause for their overweight or serious co-morbidity)? Yes=1, No=0
8. Was the time range of follow-up points given? Yes=1, No=0
9. Were lost to follow-up rates reported? Yes=1, No=0
10. Were the outcome measures used relevant to the research question? Yes=1, No=0
11. Were the trial outcome measures reported? Yes=1, No=0
12. Was the statistical analysis appropriate for the data? Yes=1, No=0

A maximum score of 20 was given to studies. Studies with a score of between 20 and 15 were defined as being of high quality, a score of between 14 and 10 of medium quality and a score of between 9 or below of low quality.

DESCRIPTION OF STUDIES

Studies Identified

The search strategy identified 2,623 abstracts for perusal. Having reviewed these abstracts, 119 were retrieved for further perusal. Of these, 21 articles were located which were possibly relevant. No further studies were found through hand searching and reference lists.

Included Studies

A total of 9 studies met the inclusion criteria and were included in the review. The studies were conducted between 1999 and 2008 and the sample size varied from 22 to 295. The length of the studies (including the follow-up period) varied from 6 months to 2 years. Eight studies exceeded 6 months in duration.

Excluded Trials

A total of 12 studies were excluded from the review for a number of reasons; non-RCT studies, studies published in a language other than English, no mention of the psychological component, included overweight participants and did not present the results separately, articles that provided a summary of studies already included in the review.

Overview of Studies

There were a total of 1859 participants in the 9 studies consisting of children aged 5 to 16 years. The studies included within the review were conducted in six different countries, namely, the UK (Hughes et al, 2008), Finland (Kalavainen et al, 2007), China (Jiang et al, 2005), Switzerland (Munsch et al, 2008), Israel (Nemet et al, 2008; Nemet et al, 2005) and the USA (Epstein et al, 2000; Epstein et al, 2004; Gortmaker, 1999). The studies were carried out

in a range of settings. Two studies took place within the primary care setting, two within universities, and the remaining studies were carried out within an outpatient clinic, a school, a childhood obesity research clinic and two within the community setting.

All studies were multi-component and used dietary and physical activity strategies as an adjunct to behavioural treatments, of which eight used family-based approaches. One study was school-based and had no parental involvement (Gortmaker et al, 1999). A range of behavioural techniques were used across the studies, with one using cognitive behavioural therapy (CBT) (Munsch et al, 2008). Some studies failed to fully report the specifics of the behavioural programme used (Nemet et al, 2005; Nemet et al, 2008; Jiang et al, 2005; Epstein et al 2000).

A range of interventions was evaluated. One study examined the effectiveness of parent-child treatment versus parent-only treatment using CBT (Munsch et al, 2008). Two studies compared interventions that examined the effects of reducing sedentary behaviour, for example, watching the television or playing video games (Epstein et al, 2000; Epstein 2004). Epstein et al (2000) compared the influence of targeting decreases in sedentary behaviour versus increases in physical activity in the comprehensive treatment of obesity. Epstein et al (2004) examined whether different methods of reducing targeted sedentary behaviours, namely stimulus control or positive reinforcement, were associated with changes in sedentary behaviour and percentage overweight.

Two studies used family-centred approaches using specific behavioral techniques. One study compared the use of family-centred counselling and behavioural strategies versus standard dietetic care (Hughes et al, 2008). The behavioural strategies were guided by models of behaviour change to improve levels of motivation in children to make changes in the areas of diet,

physical activity and sedentary behaviour. Some of the behaviour change techniques used included exploring motivation to change, exploring the pros and cons of change, goal setting, self-monitoring and relapse prevention. Kalavainen et al (2007) used a family-centred group programme and compared the efficacy of the treatment, which consisted of sessions covering nutrition education, physical activity education and behavioural therapy versus routine counselling. The approach used was based on the principles of behavioural and solution-oriented therapy.

Three studies examined the effectiveness of multi-component family-based behavioural interventions versus no treatment or a nutritional consultation. Jiang et al (2005) focused on dietary and physical activity behaviour modification and on decreasing time spent doing sedentary activities versus no treatment. A further study examined the effects of such a programme on obese children from obese families versus a control group of obese children from obese families (Nemet et al, 2008). Nemet et al (2005) examined the short and long-term effects of a 3-month multi-component family-based behavioural intervention versus a nutritional consultation coupled with instructions to be active three times per week (Nemet et al, 2005). One study examined the effectiveness of a multi-component school-based treatment versus no treatment (Gortmaker et al, 1999).

All studies measured estimates of overweight, using a range of measures, including BMI with or without tricep skinfold, percentage of body fat, body weight, percentage overweight, as the primary outcome measure, which were measured at baseline and at follow-up. Many studies also collected a range of secondary measures, including physical activity levels, fat distribution, sedentary behaviour, dietary intake, lipid profile and blood pressure measurements (Jiang et al, 2005; Epstein et al, 2000; Epstein et al, 2004; Nemet et al, 2008; Nemet et al, 2005; Gortmaker et al, 1999). Two studies measured estimates of overweight in addition to measures of behavioural problems, anxiety and depression in children and anxiety and depression in

mothers (Munsch et al, 2008). A further study measured quality of life in children as a secondary measure (Hughes et al, 2008).

The interventions were delivered by a range of people including psychotherapists, dieticians, school teachers, physical trainers, paediatricians and physicians. However, in some studies it was difficult to identify who delivered the intervention.

METHODOLOGICAL QUALITY

One study fulfilled all the study criteria and was given a maximum score of 20 points using the quality assessment rating system developed for this review (Hughes et al, 2008). Seven studies were defined as being of high quality, with scores ranging from 18 to 16 points (Munsch et al, 2008; Epstein et al, 2004; Epstein et al, 2000; Gortmaker et al, 1999; Kalavainen et al, 2007; Nemet et al, 2008; Nemet et al, 2005). One study was defined as being of medium quality, with a score of 11 points (Jiang et al, 2005).

All studies within this review were randomised controlled trials. Five studies reported the method of randomisation. Of these, three studies used computer-generated randomisation (Nemet et al, 2005; Nemet et al, 2008; Hughes et al, 2008). Two studies allocated participants by stratifying the families by sex (Epstein et al, 2000) and using a permuted block design (Munsch et al, 2008). The randomisation methods used for the four remaining studies were unreported (Epstein et al, 2004; Jiang et al, 2005; Kalavainen et al, 2007; Gortmaker et al, 1999). Four studies randomised families (Munsch et al, 2008; Kalavainen et al, 2007; Epstein et al 2004; Epstein et al, 2000). For the five remaining studies, the unit of allocation was the child (Gortmaker et al, 1999; Nemet et al, 2005; Nemet et al, 2008; Hughes et al, 2008; Jiang et al, 2005).

The sample sizes of the studies in this review were less than 100 per group in all but one study (Gortmaker et al, 1999). Details of sample size justification were provided for two studies based on power analysis calculations (Nemet et al, 2005; Hughes et al, 2008). Power calculations were also provided by, Munsch et (2005), however, the required sample size to detect a significant effect, if one existed, was not reached.

All studies reported baseline differences between groups, but no significant differences were noted. Most studies did not report the ethnicity of the participants with the exception of two studies (Kalvainen et al, 2007; 1999; Epstein et al, 2004). Gortmaker et al (1999) mentioned that the participants were multi-ethnic but did not provide a further description.

Six studies reported the response rate (Munsch et al, 2008; Hughes et al, 2008; Epstein et al, 2004, Jiang et al, 2005; Epstein et al, 2000; Kalavainen et al, 2007). All studies reported attrition rates. One study had a 0% attrition rate (Nemet et al, 2008). Six studies reported attrition rates of 25 or less. These studies were Kalavainen et al (2007) 3%, Epstein et al (2004) 5%, Jiang et al (2005) 10%, Epstein et al (2000) 15.5%, Gortmaker et al (1999) 17%, Nemet et al (2005) 20%. One study reported an attrition rate of 27.6% at 6 months and 35.5% at one year (Hughes et al, 2008). In one study, 46% of participants were lost to follow-up at six months (Munsch et al, 2008).

Five studies provided a full description of the intervention, including a full description of the psychological component (Gortmaker et al, 1999; Epstein et al, 2004; Munsch et al, 2008; Kalavainen et al, 2007; Hughes et al, 2008). All studies reported the primary outcome measure, namely an estimate of overweight, for example, BMI, percentage overweight. All studies followed participants up at 6 months post-intervention, with the exception of Nemet et al (2008) whose intervention lasted for 3 months, with participants followed up 3 months post-intervention. Validated questionnaires were used to assess

secondary outcomes in some studies, for example mental disorders and eating disorder pathology and depression and anxiety ratings (Munsch et al, 2008;), food frequency (Gortmaker et al, 1999), and quality of life (Hughes et al, 2008).

RESULTS

All studies included within this review evaluated psychological interventions in combination with dietary and physical activity components to varying degrees, to treat childhood obesity.

Intervention comparing parent-only and parent-child approaches

One study (Munsch et al, 2008) examined whether the treatment of parents only would be as efficacious as a parent-child treatment in treating childhood obesity using CBT. The children were aged between 8-12 years old. Fifty-six families were assigned to either a mother-child or mother-only CBT treatment. The treatment consisted of 16 sessions (10 weekly, 120-minute sessions and 6 monthly sessions). In both conditions mothers received CBT. Children in the mother-only group attended progressive muscle relaxation training of equal frequency and duration to the disorder-specific CBT of children in the mother-child group. The sessions included psychoeducation in the areas of nutrition and eating behaviour, physical activity and body concept, training of parental skills, relapse prevention and maintaining changes and problem solving.

Both treatments reduced children's percent overweight significantly between baseline and 6-month follow-up and these reductions were similar between the two groups. Effect sizes between the two treatments were 0.32 and 0.29 at the end of the treatment and at 6-month follow-up respectively. In addition, both treatments yielded significant improvements that were maintained in follow-up for the secondary outcome measures in children for reducing

general behaviour problems, global and social anxiety and depression ($p < 0.001$). There were no changes in mothers' BMI between baseline and 6-month follow-up. Effect sizes for mothers' BMI between the two treatments were 0.37 and 0.44 at the end of the treatment and at 6-month follow-up respectively. In addition, in the mother-only CBT group, Beck Depression Inventory (BDI) values strongly decreased, especially early in the treatment, in comparison to moderate decreases for the BDI in the mother-child CBT group. The results for the Beck Anxiety Inventory were similar but less pronounced than for the BDI, with values only tending to decrease until the 6-month follow-up in the mother-only CBT group.

Interventions focusing on altering physical activity and sedentary behaviour patterns

Two studies (Epstein et al, 2000; Epstein et al, 2004) compared interventions which examined the effect of reducing sedentary behaviour and increasing physical activity. Epstein et al (2000) examined whether targeting decreases in sedentary behaviour was equal or more effective than targeting increases in physical activity for weight loss when included as part of a comprehensive family-based childhood obesity intervention for 8-12 year olds. Low and high doses of both decreased sedentary behaviour and increased activity were examined, namely 10 or 20 hours per week of targeted sedentary behaviour and the equivalent energy expenditure of 10 or 20 miles per week of physical activity respectively. Participants assigned to the increase physical activity groups were reinforced for increasing physical activities in addition to those engaged in at the onset of the program. Participants assigned to the decrease sedentary activity groups were reinforced for reducing sedentary behaviours that compete with being active or set the occasion for eating (eg. watching television or playing computer games). The study findings supported reducing sedentary behaviours as an adjunct in the treatment of childhood obesity. Targeting either decreased sedentary behaviours or increased physical activity was associated with significant decreases in percent overweight, body fat and improved aerobic fitness. All groups

revealed similar decreases in percent overweight but the differences were not statistically significant.

The low dose increase physical activity group (n=18) reduced percent overweight from baseline by -25.6% (SD 8.1) at 6 months and -12.4% (SD 13.3) at 24 months. The high dose increase physical activity group (n=19) reduced percent overweight from baseline by -26.4% (SD 10.5) at 6 months and -13.2% (SD 16.4) at 24 months. The low dose sedentary behaviour group (n=19) differences in percent overweight from baseline were -22.4% (SD 12.6) at 6 months and -11.6% (SD 21.9) at 24 months. The high dose sedentary behaviour group (n=20) differences were -27.4 (SD 10.7) at 6 months and -14.3% (SD 16.9) at 24 months.

Epstein et al (2004) compared the effectiveness of two approaches to reduce sedentary behaviours, namely stimulus control and positive reinforcement, as part of a family-based behavioural treatment for 8-12 year old children. Sixty-three obese children and their parents (at least one parent) were assigned to a treatment consisting of 16 weekly meetings, followed by two bi-weekly meetings and two monthly meetings during a period of six months. Children in both groups were praised for meeting goals specific to their group. In addition, children in both groups were provided a contract reinforcement system to motivate children for behaviour change. Common goals for all children were meeting calorie, energy dense food and weight goals. All participants were required to reduce hours of targeted sedentary activity to 15 hours or less per week. Children in the reinforcement group were provided points for reducing their sedentary behaviour to no more than 15 hours per week. They had shaping steps of 25, 20 and 15 hours per week to reduce their sedentary time and were rewarded for meeting their goals, which were based on their baseline values. Praise and contract goals specific to decreasing targeted sedentary behaviours were used in this group. In comparison, children in the stimulus control group were positively reinforced for recording their sedentary behaviours but not for behaviour change. They

were also instructed to change their environment to prevent them from engaging in the targeted behaviour and to establish rules regarding the sedentary behaviour, for example, watching the television during specific times or that homework had to be completed before television could be watched. Additional instructions were given to this group to assist sedentary behaviour change by, for example, unplugging television or computers and posting signs displaying the sedentary time limit.

Significant decreases in percent overweight were observed for obese children in both groups. Z-BMI values for the stimulus control group were 3.3% (SD 1.0), 2.3% (SD 1.0) and 2.4% (SD 1.0) and 0, 6 and 12 months respectively. Values for the reinforced reduction group at the same time points were 3.2% (SD 1.0), 2.2% (SD 1.1) and 2.6% (SD 1.0). Effects observed for percentage overweight at 6 and 12 months were $F(2, 56)=111.82$, $p < .001$, and 12 months, $F(2, 56) = 31.88$, $p < .001$. There was a decrease (-2.2% (SD 7.4) in percentage of time in targeted sedentary behaviours, observed from 0-6 months, $F(1, 53) = 4.73$, $p < .05$, high energy density foods (-2.6% (SD 2.2), $F(1, 55) = 82.63$, $p < .001$). In addition, there were similar increases in moderate to vigorous activity observed across groups, (2.9% (SD 40), $F(1, 54) = 28.08$, $p < .001$).

Intervention comparing a multi-component school-based treatment versus no treatment

One study (Gortmaker et al, 1999) evaluated the impact of a population-based school health behaviour intervention on changing the distribution of obesity among those already obese and preventing new cases. Ten schools participated in the study. Five schools were assigned to the intervention group and five schools were assigned to the control group. 1,295 students participated in the study (intervention group $n=641$, control group $n=654$). For the intervention group, sessions focused on four behavioural changes, namely decreasing television viewing to less than 2 hours per day, decreasing the

consumption of high-fat foods, increasing fruit and vegetable intake, and increasing moderate and vigorous physical activity, which were incorporated into the existing curricula using classroom teachers. Concepts from behavioural-choice and social cognitive theories of individual change were used with a focus on reducing television viewing. The control school received no treatment. The primary outcome measure was obesity at the individual level, based on both BMI and a triceps skinfold value.

There was a significant difference in obesity prevalence amongst girls in the intervention group (n=310) in comparison to the control group (n=317). Obesity prevalence in the intervention group reduced from 23.6% to 20.3% over the two school-year intervention in comparison to the control group, where obesity prevalence increased from 21.5% to 23.7% and this difference was statistically significant ($p < .03$). However, among boys, obesity declined among both control (34.7% to 31.8%) and intervention schools (29.3% to 27.8%) and there was no significant difference in the outcome. In the intervention schools, amongst girls, the number of hours watching television was reduced from 2.98 h/d to 2.28 h/d compared with the control school values of 3.10 h/d to 2.99 h/d and a significant difference was found ($p < .001$). There was also a reduction in television viewing amongst boys within the intervention school (3.73 h/d to 3.03 h/d) compared with the control school (3.78 h/d to 3.43 h/d) and this outcome was also significant ($p < .0003$). In addition, estimated energy intake amongst girls over the two school years was less among the intervention school participants (7526.4 J/d to 8156.4 J/d) compared with controls (8122.8 J/d to 9009 J/d) that revealed a significant difference ($p < .05$). An increase in the consumption of fruit and vegetables also increased amongst girls in the intervention school (3.4 servings/d to 3.6 servings/d) compared to the controls (4.1 servings/d to 3.9 servings/d) and this was a significant outcome ($p < .0003$). There were no significant changes in the other measures.

Interventions comparing family-centred counselling/treatment versus standard care

Two studies (Hughes et al, 2008; Kalavainen et al, 2007) compared family-based interventions which used well defined approaches in the treatment of childhood obesity versus standard care. Hughes et al (2008) used family-centred counseling with various behavioural change techniques and Kalavainen et al (2007) used approaches based on the principles of behavioural and solution-oriented therapy.

Hughes et al (2008) assigned sixty-nine participants to one-to-one family behaviour counselling. The treatment consisted of eight appointments during twenty-six weeks with a total patient contact time of five hours. The control group (n=56) received typical dietetic care, which used a didactic rather than a behavioural, client-centred approach. The intervention had no significant effect relative to standard care on BMI z score and weight (kg) from baseline to 6 and 12 months. BMI z score significantly decreased in both groups from baseline to 6 months (intervention: 95% CI, -0.18 to -0.07; control: 95% CI, -0.16 to -0.03) and baseline to 12 months (intervention: 95% CI, -0.22 to -0.04; control: 95% CI, 0.26 to 0.08). Weight (kg) significantly increased in both groups from baseline to 6 months (intervention: 95% CI, 2.2-3.6; control: 95% CI: 2.8 to 4.4) and 12 months (intervention: 95% CI, 5.4-7.8; control: 95% CI 5.5-7.7). There was a significantly smaller weight increase in those in the intervention group (Mann-Whitney test, 95% CI: 0.05-2.25; $p < .04$) compared with those receiving standard care for those who complied with the treatment from baseline to 6 months, but this effect was not evident at 12 months (Mann-Whitney test, 95% CI: -1.5 to 1.9, $p = < .8$). Median weight increase was 2.9kg in the intervention group and 4.0 kg in the control group. There were significant between-group differences in favour of the intervention for changes in total physical activity, percentage of time spent in sedentary behaviour, and light-intensity physical activity. No significant between-group differences were found for changes in Quality of Life (QoL) scores for the child self-report or

parent proxy report from baseline to 6 months. Parent-reported QoL scores significantly improved from baseline to 6 months in both groups.

Kalavainen et al (2007) assigned thirty-five families to either a control or intervention group. The children in the control group received two 30-minute routine counselling appointments several months apart conducted by the school nurse, in addition to receiving a booklet containing information about weight management, eating habits and physical activity. Children also received workbooks. The intervention group received family-based group treatment lasting 6 months, which consisted of fifteen 90-minute sessions held separately for parents and children, except for one joint session. The sessions included nutrition and physical activity education and reducing sedentary lifestyles, aided by behavioural therapy. Parents were provided with treatment manuals and children with workbooks.

Children in the intervention group lost more weight for height than children receiving routine counselling (average of 6.8% and 1.8% reduction respectively, $p = <0.001$). In addition, decreases in BMI were 0.8 (intervention group) vs 0.0 (control group), $p = <0.003$. Six months post-intervention beneficial effects were partly lost, except for changes in weight for height and BMI where the differences between the two treatment programs were still significant, and for standard deviation scores there was a trend.

Multi-component family-based behavioural interventions versus no treatment or nutritional consultation (Jiang et al, 2005; Nemet et al, 2005; Nemet et al, 2008)

Three studies examined the effects of general family-based treatments. Two studies (Nemet et al, 2005; Nemet et al, 2008) compared family-oriented, combined dietary-behavioural-physical activity interventions with a control

group who received a nutritional consultation at least once and were instructed to be physically active three times per week independently.

Nemet et al (2005) examined the short and long-term effects (one year) of a 3-month treatment. Participants were assigned to either an intervention group (n=24) or a control group (n=22). Children in the intervention group along with their parents, attended a series of four evening lectures together on childhood obesity, general nutrition, a therapeutic nutritional approach for childhood obesity and exercise. For the dietary component, participants met the dietician on six occasions during the 3 months intervention. According to the age of the children, they attended all or some of the meetings either with or without family members. The first appointment lasted approximately 45-60 minutes and aimed to acquaint the family, learn about the reasons for childhood obesity, receive information about food choices and dietary and cooking habits, understand the motivation for weight loss. Subsequent appointments lasted 30-45 minutes and focused on nutritional education eg. food choices, food labels, eating habits, controlling environments that stimulate overeating). Participants also received a hypocaloric diet. The intervention groups participated in a twice weekly one-hour training programme, and were also instructed to add an extra 30-40 minutes of walking or other weight bearing activity at least once a week to reduce sedentary activities.

The intervention was effective in the short (3 months) and long term (1 year). It was associated with significant differences in changes in body weight (-2.8 + or - 2.3kg vs 1.2 + or - 2.2kg), BMI (-1.7 + or - 1.1kg/m² vs -0.2 + or - 1.0kg/m²), body fat percentage (from skinfold tests, -3.3 + or - 2.6% vs 1.4 + or - 4.7%), serum total cholesterol level (-24.6 + or - 15.1 mg/dL vs 0.8 + or - 18.7 mg/dL), low-density lipoprotein cholesterol level (-23.3 + or - 15.2mg/dL vs -3.7 + or - 17.3 mg/dL), and fitness (215 + or - 107 seconds vs 50 + or - 116 seconds) in the intervention group versus the control group. After a one-year follow-up period, there were significant differences between the

intervention group (n=20) and the control group (n=20) in body weight (0.6 + or – 6.0kg vs 5.3 + or – 2.7kg), BMI (-1.7 + or – 2.3kg/m² vs 0.6 + or – 0.9kg/m²), and body fat percentage. There was a significant increase in leisure-time physical activity among the intervention participants, compared with a decrease among the control subjects.

Nemet et al (2008) examined the effects a 3-month family-based behavioural intervention, as outlined in Nemet et al (2005), for obese children from obese families (n=11) compared to a control group of obese children and obese parents (n=11) (parental BMI >27 kg/ms) who did not participate in the combined intervention.

The intervention resulted in a significant difference in change in body weight (-0.2 + or – 0.3 vs 1.7 + or – 0.6 kg; p <0.05), BMI percentiles (-1.4 + or – 0.5 vs -0.1 + or – 0.2%; p <0.05), and to a decrease in screen time (television and computer) (-2.2 + or – 0.6 vs 0.1 + or – 0.3 hours per day; p <0.05) in the intervention group compared to the controls. In addition, the intervention led to a significant improvement in fitness level determined by endurance time (181 + or – 30 vs 26 + or – 63 seconds in the intervention vs control group respectively; p <0.05). There was no change in parental BMI during the follow-up period.

Jiang et al (2005) investigated the effectiveness of a two-year family-based behavioural programme in treating childhood obesity. Seventy-five participants (intervention group, n=36 and control group n=39) were assigned to either a treatment group, which consisted of a detailed dietary modification plan for each family and in addition, the intervention aimed to increase physical activity (20-30 minutes four days per week). Children were also encouraged to decrease sedentary time (for example, substituting watching the television and going for a walk instead). The behaviour modification approach was tailored to individual family and child circumstances and was

accompanied by behaviour modification material. The researchers (paediatricians) visited the families, on a monthly basis, during which time the researchers observed the family environment, cooking styles, foods regularly consumed by the families and where foods were stored. The control group received no intervention.

During the two-year follow-up, children in both groups had a similar linear growth rate, with mean height increases of 8.2 and 8.0 in treatment and control groups. After two years the intervention group decreased 0.3 kg in weight, in comparison to the control group who increased by 5.5 kg. There was a significant difference in weight change between the two groups ($p < 0.001$). Compared with the initial value, the average BMI showed a significant reduction only in the treatment group (mean change = 2.6, 95% CI 2.06 to 3.18, $p < 0.001$). In addition, there was a significant correlation between change in BMI and change in triglycerides in the treatment group ($r=0.488$, $p = <0.004$). After two years of treatment, total cholesterol decreased 5.5% and triglycerides 9.7% in the treatment group and there were no significant changes in the controls. Between-group changes in systolic and diastolic blood pressure, total cholesterol and triglycerides were also statistically significant.

DISCUSSION

Nine studies were included in this review, which evaluated the effectiveness of a range of psychological interventions in the treatment of childhood obesity across a range of settings. As few studies included the same comparisons and outcomes, a meta-analysis was not conducted for this review. In addition, the majority of studies used small sample sizes making it difficult to draw conclusions. The results were, therefore, presented in narrative form.

Interventions aimed at reducing sedentary behaviour and/or increasing physical activity levels as a component of family-based behavioural treatments appear to be effective in achieving and maintaining weight loss in obese children (Epstein et al, 2000; Epstein et al, 2004). The quality of both studies were high, although the sample sizes were small, so firm conclusions cannot be made based on these results. The results support the findings of previous systematic reviews (Summerbell et al, 200; Glenny et al, 1997). As both studies were conducted in the USA, it would be useful to replicate these studies in other countries using larger sample sizes.

It has been proposed that parents should be the main agents for change in treating childhood obesity (Golan et al, 1998; Golan et al, 2004; Golan et al, 2006). Upon examining whether the treatment of parents only would be as efficacious as a parent-child treatment, no difference was found (Munsch et al, 2008). Both treatments equally and significantly reduced children's percent overweight. The approach used was CBT, which may have accounted for these results. It would be of interest to replicate this study using older children, as it has been suggested that younger children may be more likely to comply with instructions given by their parents whereas older children may not be as willing to do so (Glenny et al, 1999).

A population-based school-wide treatment approach appears to be effective in reducing the prevalence of obesity in girls (Gortmaker et al, 1999). This study was of a high quality and had a large sample size. An intervention effect was not found in boys, which suggests that causal factors operating among boys and girls should be examined in the future in an attempt to explain these differences. More studies using this approach, with the specific aim of reducing obesity need to be carried out, as the authors suggest that this study is the first of its kind.

The findings suggest that multi-component family-based behavioural interventions are effective in treating obesity (Nemet et al, 2005; Nemet et al, 2008; Jiang et al, 2005). Family-centred group programmes based on the principles of behavioural and solution-oriented counselling on nutrition and exercise appear to be effective in the short-term (Kalavainen et al, 2007).

Limitations of the Review

The sample size of the majority of studies was too small, thus making it difficult to draw firm conclusions from the results. A further limitation was that the length of follow-up of participants was often too short to assess the effectiveness in the long-term. In addition, unpublished data was not sought for this review, which if included may have resulted in finding more non-significant research findings. A further limitation was that there was little information given on the ethnic backgrounds and social status of the participants.

In order to strengthen the evidence base for the future, more studies need to be conducted in the UK, as research findings from other countries may not always be transferable to the UK context. Studies also need to be conducted in populations reflecting a range of social classes and ethnic backgrounds and these demographic details should be reported within articles. In addition, studies with larger sample sizes are needed. Some studies were lacking in quality and were not included within this review, as the results were not sufficiently robust. More high quality studies are required. Longitudinal studies are needed to measure the impact of interventions over the longer term. Few studies in this area have evaluated the cost effectiveness of interventions. Future studies should estimate the costs associated with delivering interventions to treat childhood obesity, in addition to estimates of the health gains of such interventions.

CONCLUSIONS

Implications for Practice

The evidence for the effectiveness of psychological interventions for treating childhood obesity is equivocal and no one intervention can be recommended. However interventions aimed at reducing sedentary behaviour and school-based approaches focusing on diet, increasing physical activity and reducing sedentary activities may be useful in addressing this growing problem. In general, family-based behavioural interventions combined with dietary and nutritional components also appear to be efficacious.

Childhood obesity is increasing rapidly worldwide and has been identified as a major public health concern. Due to the health problems associated with obesity, this area requires a high level of investment.

REFERENCES OF STUDIES INCLUDED IN THIS REVIEW

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APPENDIX D1 – Data Extraction Forms

DATA EXTRACTION FORM

Study:	Epstein et al 2000
Study objective:	To compare the influence of targeting decreases in sedentary behaviour vs increases in physical activity in the comprehensive treatment of obesity in 8 to 12 year old children. The second aim was to test whether there was a dose-response relationship between the amount of reduction in sedentary behaviours and weight loss and fitness outcomes.
Methods:	
Design:	Randomised controlled trial
Blinding:	Unclear
Attrition:	12 participants (13%) 12 did not attend 2-year follow up
Participants:	
Country:	USA
Entry Criteria:	Child between 20% and 100% overweight. Neither parent more than 100% overweight.
No:	90 obese children and at least one parent
Demographics:	8 -12 year old children (32% male)
Intervention:	
Type of intervention:	Family-based comprehensive behavioural weight control treatment that included dietary and behaviour change information but differed in whether sedentary or physical activity behaviours were targeted and the degree of behaviour change required (high vs low). 16 weekly meetings, followed by two bi-weekly meetings and two monthly meetings during the 6 month treatment. The Traffic Light Diet was followed.
Delivered by:	Unclear – independent therapist
No. of conditions:	Four (two increase activity groups – low dose n=22, high dose n=23 and two decrease sedentary groups – low dose n=23, high dose n=22)

Duration of intervention:	6 months
Follow up points:	6, 12 and 24 months
Setting:	Childhood obesity research clinic
Outcomes:	
Weight status:	BMI, percentage of body fat
Other:	Fitness, sedentary and physical activity behaviour
Analysis Used:	Analysis of variance, mixed ANOVA, F-tests, regression models
Quality Score	16
Results:	Targeting either decreased sedentary behaviours or increased physical activity was associated with significant decreases in percent overweight and body fat and improved aerobic fitness. Self-reported activity minutes increased and targeted sedentary time decreased during treatment. The results support reducing sedentary behaviours as an adjunct in the treatment of paediatric obesity.
Notes:	Baseline data available for 76/90. Financial deposit of \$75 dependant on completion of intervention and families paid \$50 for attending 24-month follow-up.

DATA EXTRACTION FORM

Study:	Epstein et al 2004
Study objective:	<p>Primary - To determine whether different methods of reducing targeted sedentary behaviours are associated with differences in the pattern of change in sedentary and active behaviours and in percentage of overweight change.</p> <p>Secondary – To examine whether individual differences in substitution of physical activity for sedentary behaviours or complements of eating to sedentary behaviours are related to treatment efficacy.</p>
Methods:	
Design:	Randomised controlled trial
Blinding:	Unclear
Attrition:	5% (3 participants)
Participants:	
Country:	USA
Entry Criteria:	Child being >85 th body mass index percentile and one parent willing to attend treatment meetings.
No:	63 families (child and a parent)
Demographics:	8-12 year olds, boys n=23, girls n=39 90.3% White, 6.5% black, 1.6% Hispanic and 1.6% other racial/ethnic groups.
Intervention:	
Type of intervention:	Family-based behavioural treatment that included either reinforcement to reduce sedentary behaviour or stimulus control to reduce sedentary behaviours. 16 weekly meetings, followed by two bi-weekly meetings and two monthly meetings during the 6 month treatment. The Traffic Light Diet was followed.
Delivered by:	Unclear – cited as individual therapist
No. of conditions:	Two (Stimulus control n=31, Reinforcement n=32)
Duration of intervention:	6 months

Follow up points:	6 and 12 months
Setting:	Unclear – probably a community based setting
Outcomes:	
Weight status:	Percentage overweight and BMI
Other:	Dietary intake, physical activity status, weights of children and parent(s).
Analysis Used:	t-tests, mixed ANOVA, regression models.
Quality Score:	16
Notes:	Significant decreases in percent overweight were observed for obese children in both groups, in addition to similar reductions in sedentary behaviours and high energy density foods, and similar increases in moderate to vigorous activity across groups. There were no differences in weight control or behaviours associated with weight control for the stimulus control and reinforcement methods for modifying sedentary behaviours.

DATA EXTRACTION FORM

Study:	Gortmaker et al 1999
Study objective:	To evaluate the impact of a school-based health behaviour intervention on ethnically diverse obese children. The population based approach focused on changing the distribution of obesity in the population by both reducing obesity among those already obese and preventing new cases.
Methods:	
Design:	Randomised controlled field trial
Blinding:	No
Attrition:	17%
Participants:	
Country:	USA
Entry Criteria:	Obesity was defined as a composite indicator based on both BMI and a triceps skinfold value greater than or equal to age and sex specific 85 th percentiles.
No:	1295 students (control n=654, Intervention n=641)
Demographics:	11-13 year old boys and girls (female n=627, male n=668).
Intervention:	
Type of intervention:	The intervention school received a school-based intervention where students participated in sessions which were included within existing curricula using classroom teachers in 4 major subjects (language arts, math, science and social studies) and physical education for a total of 16 core lessons each in year 1 and year 2 (total 32). Lessons run for one or two 45-minute periods. A 2-week campaign to reduce television watching in households was developed in an additional lesson. Sessions focused on decreasing television watching, decreasing consumption of high-fat foods, increasing fruit and vegetable intake, and increasing moderate and vigorous physical activity. Concepts from behavioural-choice and social cognitive theories of individual change were used

with a focus on reducing television viewing. The control school received their usual health curricula and PE classes.

Delivered by: School teachers

No. of conditions: Two (5 control schools n=654 and 5 intervention schools n=641)

Duration of intervention: Two school years (from fall 1995 to spring 1997)

Follow up points: Anthropometry data and student surveys were collected at the beginning of grades 6 and 7 in the fall of 1995 and follow-up measurements collected in Spring 1997 (grades 7 and 8).

Setting: School-based

Outcomes:

Weight status: BMI and Tricep skinfold.

Other: Self-reports of television viewing, moderate and vigorous physical activity, percent of total dietary intake from fat, servings of fruit and vegetables and total energy intake.

Analysis Used: Generalised estimating equation method used for analysis because schools and not individuals were randomised for analysis of dichotomous outcomes to adjust for individual-level covariates under cluster randomisation. Regression models.

Quality Score: 16

Notes: The prevalence of obesity among girls in intervention schools was reduced compared with controls, controlling for baseline obesity, with no difference found among boys. There was a greater reduction in obesity among intervention girls vs control girls. The intervention reduced television hours among both girls and boys, and increased fruit and vegetable consumption and resulted in a smaller increment in total energy intake among girls.

DATA EXTRACTION FORM

Study:	Hughes et al 2008
Study objective:	To determine whether a generalisable best-practice individualised behavioural intervention reduced BMI Z score relative to standard dietetic care (control condition) among obese children.
Methods:	
Design:	Randomised Controlled Trial
Blinding:	Assessor-blinded (computer generated randomisation in block of 10)
Attrition:	Dropout at six months – 27.6%
Participants:	
Country:	UK
Entry Criteria:	Child with BMI >98 th centile (relative to UK 1990 reference data) and at least one parent who perceived the child's weight to be a problem and was willing to make lifestyle changes.
No:	134 (power analysis calculation – 34 needed in each group)
Demographics:	5 - 11 year olds, 59 boys and 75 girls
Intervention:	
Type of intervention:	Intervention Group - Family-based intervention using various behavioural change techniques (family-centred counselling and behavioural strategies) to modify diet, physical activity and sedentary behaviour. 1-to-1 behaviour counselling delivered by a dietician (dietician saw one family). The program consisted of 8 appointments (7 outpatient visits and 1 home visit) during 26 weeks with a total patient contact time of 5 hours. Control Group – Received typical dietetic care as offered to obese children by hospital and community dietetic services in Scotland of 3 to 4 outpatient appointments delivered by paediatric

dieticians during 6 to 10 months with a total contact time of 1.5 hours. A didactic 'medical model' rather than a behavioural, client-centred approach was used.

Delivered by:	Paediatric dieticians
No. of conditions:	One intervention group and one control group (intervention n=69 and control group n=65).
Duration of intervention:	Six months
Follow up points:	6 and 12 months
Setting:	Primary health care setting
Outcomes:	
Weight status:	BMI.
Other:	Weight, objectively measured physical activity and sedentary behaviour, waist circumference (fat distribution), growth and quality of life (Paediatric Quality of Life Inventory).
Analysis Used	Mann-Whitney test, t-test, chi square, chi square.
Quality Score:	20
Notes:	A generalisable, best-practice individualised behavioural intervention had modest benefits on objectively measure physical activity and sedentary behaviour but no significant effect on BMI z score compared with standard care among obese children.

DATA EXTRACTION FORM

Study:	Jiang 2005
Study objective:	To examine whether a family-based behavioural treatment was feasible in China and to examine its impact on obesity school children.
Methods:	
Design:	Randomised controlled trial
Blinding:	No details
Attrition:	7 participants did not complete the 2-year treatment
Participants:	
Country:	China
Entry Criteria:	Childhood obesity as defined in China as weight-for-height >120% of the Chinese reference
No:	75 families
Demographics:	13 year olds (41 boys and 27 girls).
Intervention:	
Type of intervention:	A detailed dietary modification plan was implemented in each treatment group family. The intervention also aimed to increase physical activity (20-30 mins per day, 4 x per week – 3 week days and one day on the weekend). Children were also urged to decrease sedentary time (eg. watching TV, and to go for a walk instead). Paediatricians visited the intervention families once per month. The behaviour modification approach was tailored to individual family and child circumstances. The control group had a normal school and family life and did not receive any special intervention.
Delivered by:	Paediatricians
No. of conditions:	2 (one control group, n=39 and one experimental group, n=36 group)
Duration of intervention:	Two years
Follow up points:	6, 12, 18 and 24 months

Setting:	School and community setting.
Outcomes:	
Weight status:	Body mass index (BMI)
Other:	Blood pressure, cholesterol and triglyceride levels measured at baseline and after two years.
Analysis Used:	Independent t tests, Mann-Whitney test, ANOVA, and correlations.
Quality Score:	11
Notes:	The intervention was feasible to use in treating obesity in school-children in Beijing, China. After two years of implementation it significantly decreased the degree of obesity (9.8% reduction in initial BMI), reduced levels of blood pressure and decreased serum lipids. There were no significant changes among control children.

DATA EXTRACTION FORM

Study:	Kalavainen et al 2007
Study objective:	To compare the efficacy of family-based group treatment focusing on a health-promoting lifestyle with routine counselling in the treatment of childhood obesity.
Methods:	
Design:	Randomised controlled trial
Blinding:	Unblinded
Attrition:	2 dropouts
Participants:	
Country:	Finland
Entry Criteria:	Height for weight (defined as deviation of weight from median weight for height and gender) from 120% to 200% (mean 142%, population mean 100%)
No:	70
Demographics:	7-9 year olds (boys n=28, girls n=42), of Finnish origin except one with an African father.
Intervention:	
Type of intervention:	Family-based group treatment consisting of 15 separate 90 minute sessions held separately for parents and children except for one joint session. Sessions included nutrition education, physical activity education and reducing sedentary lifestyles with the help of behavioural therapy, based on the principles of behavioural and solution-orientated therapy. Parents were provided with treatment manuals and children with workbooks. The first 10 sessions were held weekly, and the remaining 5 held every 2 weeks for 3 months. Routine treatment was modified from current counselling practice for obese children in school health care in Finland and consisted of two 30-minute appointments intended for children, led by school nurses several months apart, which parents were allowed to participate in. In addition, control group families received a booklet containing information

about weight management, eating habits and physical activity, and children received workbooks, both based on a cognitive behaviour therapy workbook.

Delivered by: Multi-disciplinary (Dieticians, students of clinical nutrition).

No. of conditions: Two (intervention group n=35, control group n=35)

Duration of intervention: 6 months

Follow up points: 6 months and 1 year

Setting: Routine primary care clinical setting

Outcomes:

Weight status: Change of weight for height and BMI.

Analysis Used: Independent sample t-tests, chi square, Fishers exact, analysis of covariance, logistic regression analysis, Pearson's linear correlation coefficients.

Quality Score: 17

Notes: Children receiving the family-based group treatment lost more weight for height (6.8%) than children receiving routine counselling (1.8%). The beneficial effects of the group treatment were significant also when assessed by changes in children's BMI and BMI standard deviation scores. 6 months after the intervention (at 12 months) beneficial effects were partly lost, but for changes in weight for height and BMI, the difference between the two treatment programs were still significant, and for BMI standard deviation scores there was a trend.

DATA EXTRACTION FORM

Study:	Munsch et al 2008
Study objective:	To examine whether the treatment of parents only would be as efficacious as a parent-child treatment of childhood obesity.
Methods:	
Design:	Randomised controlled trial. Permuted block design.
Blinding:	Not stated
Attrition:	3 participants dropped out before treatment started. 16 discontinued the intervention (control group n=4 and intervention group n=12) and 10 were lost to 6-month follow-up (intervention group n=5 and control n=5).
Participants:	
Country:	Switzerland
Entry Criteria:	BMI >85 th percentile adjusted for gender and age
No:	56 obese children and family (family = child and mother).
Demographics:	8-12 year olds
Intervention:	
Type of intervention:	Families were randomly assigned to either a mother-child or mother-only cognitive behavioural therapy treatment. The treatment phase consisted of 16 sessions (10 weekly, 120-minute sessions and 6 monthly sessions). In both conditions mothers received CBT. Children in the mother-only group attended progressive muscle relaxation training of equal frequency and duration to the disorder-specific CBT of children in the mother-child group.
Delivered by:	Psychotherapists and co-therapists (master's degree students)
No. of conditions:	Two (mother-child condition n=31 and mother-only condition n=25).
Duration of intervention:	8.5 months

Follow up points: At the end of treatment and at end of 6-month follow-up

Setting: Outpatient clinic

Outcomes:

Weight status: Percent overweight for children and BMI for mothers

Other: Measures of behavioural problems, anxiety and depression in children and eating behaviour, anxiety and depression in mothers.

Analysis Used: t-tests, chi square, linear mixed models

Quality Score: 18

Notes: Both treatments were efficacious, reducing children's percent overweight significantly and equally by 6-month follow-up. In addition, both treatments provided similar results in reducing general behaviour problems, global and social anxiety and depression.

DATA EXTRACTION FORM

Study:	Nemet et al 2005
Study objective:	To examine the short and long-term effects (one year) of a 3-month combined dietary-behavioural physical activity intervention on body weight, BMI, BMI percentile, dietary and leisure-time habits, fitness and lipid profiles among obese Israeli children.
Methods:	
Design:	Randomised controlled trial. Computerised random number generation.
Blinding:	No
Attrition:	6 participants withdrew from the program (20% dropout), 24 completed the 3-month program and 20 returned for follow-up 1 year later. 22 controls completed the 3-month follow-up and 20 returned for 1 year follow-up.
Participants:	
Country:	Israel
Entry Criteria:	Unclear – defined as childhood obesity
No:	54 (26 boys and 20 girls completed the 3-month program). Power analysis calculation – 18 in each group needed.
Demographics:	6-16 year old children
Intervention:	
Type of intervention:	Participants and parents together attended a series of 4 evening lectures on childhood obesity, general nutrition, a therapeutic nutritional approach for childhood obesity and exercise and childhood obesity. Dietary component: participants met with the dietician 6 times during the program. According to the age of the participants, they attended all or some of the meetings either with or without family members. The intervention adopted a family-based approach to address obesity. The first appointment lasted 45-60 minutes aimed to acquaint the family, learn about the reasons for childhood obesity, receive information about food choices and dietary and cooking habits, understand the motivation for weight loss.

Subsequent appointments lasted 30-45 minutes and focused on nutritional education (eg. food choices, food labels, eating habits, controlling environments that stimulate overeating). Participants also received a hypocaloric diet. The intervention group participated in a twice weekly, one hour, training program and were also instructed to add an extra 30-45 minutes of walking or other weight bearing activity at least once a week and to reduce sedentary activities. The control group were referred to a nutritional consultation at least once and were instructed to be physically active three times per week independently.

Delivered by: Multi-disciplinary (physician and dieticians)

No. of conditions: Two (intervention n=24 and control n=22)

Duration of intervention: 3 months

Follow up points: One year

Setting: Outpatient/primary care

Outcomes:

Weight status: Body weight, BMI, body fat percentage

Other: Serum total cholesterol, low-density lipoprotein cholesterol level, fitness and leisure time physical activity.

Analysis Used: t-tests, two-way repeated measures, analysis of variance.

Quality Score: 16

Notes: The intervention was effective in the short-term (3 months) and long-term (1 year). It was associated with significant weight loss, reduced BMI, reduced body fat, increased habitual physical activity and improved fitness, reduced LDL cholesterol levels. Control participants gained weight, increased body fat percentage, did not change habitual physical activity levels and had a lessor improvement in fitness. Favourable effects on body weight, BMI, body fat and habitual physical activity were maintained among the intervention participants compared to the control participants after a 1-year follow-up period.

DATA EXTRACTION FORM

Study:	Nemet et al 2008
Study objective:	To examine the effects of a brief (3-month), intense, family-oriented, combined dietary-behavioural-physical activity intervention on body weight, BMI, BMI percentile, body composition and fitness in pre-pubertal obese children compared to a control group of obese children and obese parents who did not participate in the combined intervention.
Methods:	
Design:	Randomised controlled trial. Computerised random number generated method.
Blinding:	Unclear
Attrition:	All intervention children completed the 3-month intervention and all control children completed the 3 months follow-up.
Participants:	
Country:	Israel
Entry Criteria:	Obese children (BMI >95 th percentile) from obese families (parental BMI >27 kg/m ²)
No:	22 (intervention group n=11, 4 males and 7 females, and control group n=11, 4 males and 7 females)
Demographics:	8-11 year olds (14 females and 8 males)
Intervention:	
Type of intervention:	Intervention Group: Participants attended 14 weekly meetings with the dietician over the 3-month program. Parents of participants met separately with the dietician bi-weekly (total of 8 meetings). The first appointment lasted 60-90 minutes and aimed to acquaint the family, learn about the reasons for childhood obesity, receive information about food choices and dietary and cooking habits, understand the motivation for weight loss. The last meeting was devoted to measurements and for individual summary of the program. In between, the appointments were

performed in separate groups for children and parents (60 mins each and 12 for children and 6 for parents), and focused on nutritional education (eg. food choices, food labels, eating habits, controlling environments that stimulate overeating). Additionally, children received dietary information, eg. worksheets and/or flyers. Participants also received a hypocaloric diet. The children in the intervention group participated in a twice weekly, one hour, training program and were also instructed to add an extra 30-45 minutes of other weight bearing activity at least once a week and to reduce sedentary activities. All children also participated in a weekly 45 min movement therapy session.

Control Group: Children were referred to an ambulatory nutritional consultation at least once and were instructed to be physically active three times per week independently.

Delivered by: Multi-disciplinary (physician and dieticians, professional youth trainers)

No. of conditions: Two (intervention n=11 and control n=11)

Duration of intervention: 3 months

Follow up points: Post intervention (3 months)

Setting: University setting

Outcomes:

Weight status: Body weight, BMI, body composition

Other: Fitness and screen time (TV and computer)

Analysis Used: t-test, two-way repeated measure ANOVA

Quality Score: 17

Notes: The combined dietary-behavioural-physical activity intervention led to significant between group differences in weight change, BMI percentile change and a decrease of sedentary behaviours (screen time - TV and computer) compared to the control group. Additionally, the intervention led to a significant improvement in fitness levels determined by endurance time in the intervention group compared to the control group.

APPENDIX D2 – Quality Assessment Forms

QUALITY ASSESSMENT – Epstein et al 2000

Was a full description of the intervention given?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 2

Were participants randomly allocated?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 1

Were the eligibility criteria specified?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Was the sample size adequate (100+ participants in each group or sample size established by power analysis)?

Yes 1

No 0

Score allocated= 0

Was the study response rate reported?

Yes 1

No 0

Score allocated= 1

Were baseline comparisons made between the control and intervention groups?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 3

Were checks carried out to ensure that there were no other confounding variables (eg. participation in a diet program or other psychological treatment for weight loss, diet or exercise restrictions, an underlying medical cause for their overweight or serious co-morbidity)?

Yes 1

No 0

Score allocated= 1

Was the time range of follow-up points given?

Yes 1

No 0

Score allocated= 1

Were lost to follow-up rates reported?

Yes 1

No 0

Score allocated= 1

Were the outcome measures used relevant to the research question?

Yes 1

No 0

Score allocated= 1

Were the trial outcome measures reported (eg. percentage overweight and BMI)?

Yes 1

No 0

Score allocated= 1

Was the statistical analysis appropriate for the data?

Yes 1

No 0

Score allocated= 1

TOTAL SCORE = 16

QUALITY ASSESSMENT – Epstein et al 2004

Was a full description of the intervention given?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Were participants randomly allocated?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 0

Were the eligibility criteria specified?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Was the sample size adequate (100+ participants in each group or sample size established by power analysis)?

Yes 1

No 0

Score allocated= 0

Was the study response rate reported?

Yes 1

No 0

Score allocated= 1

Were baseline comparisons made between the control and intervention groups?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 3

Were checks carried out to ensure that there were no other confounding variables (eg. participation in a diet program or other psychological treatment for weight loss, diet or exercise restrictions, an underlying medical cause for their overweight or serious co-morbidity)?

Yes 1

No 0

Score allocated= 1

Was the time range of follow-up points given?

Yes 1

No 0

Score allocated= 1

Were lost to follow-up rates reported?

Yes 1

No 0

Score allocated= 1

Were the outcome measures used relevant to the research question?

Yes 1

No 0

Score allocated= 1

Were the trial outcome measures reported (eg. percentage overweight and BMI)?

Yes 1

No 0

Score allocated= 1

Was the statistical analysis appropriate for the data?

Yes 1

No 0

Score allocated= 1

TOTAL SCORE = 16

QUALITY ASSESSMENT – Gortmaker et al 1999

Was a full description of the intervention given?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Were participants randomly allocated?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 1

Were the eligibility criteria specified?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Was the sample size adequate (100+ participants in each group or sample size established by power analysis)?

Yes 1

No 0

Score allocated= 1

Was the study response rate reported?

Yes	1
No	0

Score allocated= 0

Were baseline comparisons made between the control and intervention groups?

Adequate	3
Partial	2
Inadequate	1
Unknown	0

Score allocated= 3

Were checks carried out to ensure that there were no other confounding variables (eg. participation in a diet program or other psychological treatment for weight loss, diet or exercise restrictions, an underlying medical cause for their overweight or serious co-morbidity)?

Yes	1
No	0

Score allocated=0

Was the time range of follow-up points given?

Yes	1
No	0

Score allocated= 1

Were lost to follow-up rates reported?

Yes	1
No	0

Score allocated=1

Were the outcome measures used relevant to the research question?

Yes 1

No 0

Score allocated= 1

Were the trial outcome measures reported (eg. percentage overweight and BMI)?

Yes 1

No 0

Score allocated= 1

Was the statistical analysis appropriate for the data?

Yes 1

No 0

Score allocated= 1

TOTAL SCORE = 16

QUALITY ASSESSMENT - Hughes et al 2008

Was a full description of the intervention given?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Were participants randomly allocated?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 3

Were the eligibility criteria specified?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Was the sample size adequate (100+ participants in each group or sample size established by power analysis)?

Yes 1

No 0

Score allocated= 1

Was the study response rate reported?

Yes	1
No	0

Score allocated= 1

Were baseline comparisons made between the control and intervention groups?

Adequate	3
Partial	2
Inadequate	1
Unknown	0

Score allocated= 3

Were checks carried out to ensure that there were no other confounding variables (eg. participation in a diet program or other psychological treatment for weight loss, diet or exercise restrictions, an underlying medical cause for their overweight or serious co-morbidity)?

Yes	1
No	0

Score allocated= 1

Was the time range of follow-up points given?

Yes	1
No	0

Score allocated= 1

Were lost to follow-up rates reported?

Yes	1
No	0

Score allocated= 1

Were the outcome measures used relevant to the research question?

Yes 1

No 0

Score allocated= 1

Were the trial outcome measures reported (percentage overweight and BMI)?

Yes 1

No 0

Score allocated= 1

Was the statistical analysis appropriate for the data?

Yes 1

No 0

Score allocated= 1

TOTAL SCORE = 20

QUALITY ASSESSMENT – Jiang et al 2005

Was a full description of the intervention given?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 2

Were participants randomly allocated?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 0

Were the eligibility criteria specified?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 1

Was the sample size adequate (100+ participants in each group or sample size established by power analysis)?

Yes 1

No 0

Score allocated= 0

Was the study response rate reported?

Yes 1

No 0

Score allocated= 1

Were baseline comparisons made between the control and intervention groups?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 2

Were checks carried out to ensure that there were no other confounding variables (eg. participation in a diet program or other psychological treatment for weight loss, diet or exercise restrictions, an underlying medical cause for their overweight or serious co-morbidity)?

Yes 1

No 0

Score allocated= 0

Was the time range of follow-up points given?

Yes 1

No 0

Score allocated= 1

Were lost to follow-up rates reported?

Yes 1

No 0

Score allocated= 1

Were the outcome measures used relevant to the research question?

Yes 1

No 0

Score allocated= 1

Were the trial outcome measures reported (eg. percentage overweight and BMI)?

Yes 1

No 0

Score allocated= 1

Was the statistical analysis appropriate for the data?

Yes 1

No 0

Score allocated= 1

TOTAL SCORE = 11

QUALITY ASSESSMENT – Kalavainen et al 2007

Was a full description of the intervention given?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Were participants randomly allocated?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 1

Were the eligibility criteria specified?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Was the sample size adequate (100+ participants in each group or sample size established by power analysis)?

Yes 1

No 0

Score allocated= 0

Was the study response rate reported?

Yes 1

No 0

Score allocated= 1

Were baseline comparisons made between the control and intervention groups?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 3

Were checks carried out to ensure that there were no other confounding variables (eg. participation in a diet program or other psychological treatment for weight loss, diet or exercise restrictions, an underlying medical cause for their overweight or serious co-morbidity)?

Yes 1

No 0

Score allocated= 1

Was the time range of follow-up points given?

Yes 1

No 0

Score allocated= 1

Were lost to follow-up rates reported?

Yes 1

No 0

Score allocated= 1

Were the outcome measures used relevant to the research question?

Yes 1

No 0

Score allocated= 1

Were the trial outcome measures reported (eg. percentage overweight and BMI)?

Yes 1

No 0

Score allocated= 1

Was the statistical analysis appropriate for the data?

Yes 1

No 0

Score allocated= 1

TOTAL SCORE = 17

QUALITY ASSESSMENT – Munsch et al 2008

Was a full description of the intervention given?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Were participants randomly allocated?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 2

Were the eligibility criteria specified?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Was the sample size adequate (100+ participants in each group or sample size established by power analysis)?

Yes 1

No 0

Score allocated= 0

Was the study response rate reported?

Yes 1

No 0

Score allocated= 1

Were baseline comparisons made between the control and intervention groups?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 3

Were checks carried out to ensure that there were no other confounding variables (eg. participation in a diet program or other psychological treatment for weight loss, diet or exercise restrictions, an underlying medical cause for their overweight or serious co-morbidity)?

Yes 1

No 0

Score allocated= 1

Was the time range of follow-up points given?

Yes 1

No 0

Score allocated= 1

Were lost to follow-up rates reported?

Yes 1

No 0

Score allocated= 1

Were the outcome measures used relevant to the research question?

Yes 1

No 0

Score allocated= 1

Were the trial outcome measures reported (eg. percentage overweight and BMI)?

Yes 1

No 0

Score allocated= 1

Was the statistical analysis appropriate for the data?

Yes 1

No 0

Score allocated= 1

TOTAL SCORE = 18

QUALITY ASSESSMENT – Nemet et al 2005

Was a full description of the intervention given?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 2

Were participants randomly allocated?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 3

Were the eligibility criteria specified?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 1

Was the sample size adequate (100+ participants in each group or sample size established by power analysis)?

Yes 1

No 0

Score allocated= 1

Was the study response rate reported?

Yes 1

No 0

Score allocated= 0

Were baseline comparisons made between the control and intervention groups?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 3

Were checks carried out to ensure that there were no other confounding variables (eg. participation in a diet program or other psychological treatment for weight loss, diet or exercise restrictions, an underlying medical cause for their overweight or serious co-morbidity)?

Yes 1

No 0

Score allocated= 1

Was the time range of follow-up points given?

Yes 1

No 0

Score allocated= 1

Were lost to follow-up rates reported?

Yes 1

No 0

Score allocated= 1

Were the outcome measures used relevant to the research question?

Yes 1

No 0

Score allocated= 1

Were the trial outcome measures reported (eg. percentage overweight and BMI)?

Yes 1

No 0

Score allocated= 1

Was the statistical analysis appropriate for the data?

Yes 1

No 0

Score allocated= 1

TOTAL SCORE = 16

QUALITY ASSESSMENT – Nemet et al 2008

Was a full description of the intervention given?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 2

Were participants randomly allocated?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 3

Were the eligibility criteria specified?

Adequate 3

Partial 2

Inadequate 1

Score allocated= 3

Was the sample size adequate (100+ participants in each group or sample size established by power analysis)?

Yes 1

No 0

Score allocated= 0

Was the study response rate reported?

Yes 1

No 0

Score allocated= 0

Were baseline comparisons made between the control and intervention groups?

Adequate 3

Partial 2

Inadequate 1

Unknown 0

Score allocated= 3

Were checks carried out to ensure that there were no other confounding variables (eg. participation in a diet program or other psychological treatment for weight loss, diet or exercise restrictions, an underlying medical cause for their overweight or serious co-morbidity)?

Yes 1

No 0

Score allocated= 1

Was the time range of follow-up points given?

Yes 1

No 0

Score allocated= 1

Were lost to follow-up rates reported?

Yes 1

No 0

Score allocated= 1

Were the outcome measures used relevant to the research question?

Yes 1

No 0

Score allocated= 1

Were the trial outcome measures reported (percentage overweight and BMI)?

Yes 1

No 0

Score allocated= 1

Was the statistical analysis appropriate for the data?

Yes 1

No 0

Score allocated= 1

TOTAL SCORE = 17