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Chapter One: Literature Review

1.1 Background/Rationale for physical activity:

1.1.1 Definition of physical activity

There are many definitions of physical activity. However, the most commonly used is that by Casperson, Powell, and Christenson (1985 pg 126) who define physical activity as:

“Any bodily movement produced by skeletal muscles which results in energy expenditure”.

They also explain that everyone carries out some form of physical activity in order to sustain life but the amount, type and intensity of this activity varies considerably between individuals.

1.1.2 Public Health Background

Physical activity has wide ranging public health consequences and negative economic effects on the country. It has been estimated that physical inactivity costs the National Health Service (NHS) and the economy in England £8.2 billion a year with a direct cost to the NHS estimated at £1 - £1.8 billion a year (Department of Health-DoH 2009). This estimate does not include the contribution of physical inactivity to obesity which on its own has been estimated at £2.5 billion each year (DoH 2004a). It has been estimated that by 2050 the cost to the NHS from obese

and overweight individuals will reach £9.7 billion per year with wider costs to society of £49.9 billion per year at today's prices (Government Office for Science 2007). These are significant financial burdens on an already stretched NHS budget.

In 2012 London will be hosting the Summer Olympics which has led to a large focus within health policy on getting the nation more active (DoH 2004a, DoH 2005). As a response to the Choosing Health white paper (DoH 2004b) the government focus on the NHS as a role model organisation for promoting physical activity in the workplace. The most recent government white paper, Healthy Lives, Healthy People (DoH 2010) outlines the governments continuing commitment to increasing the countries physical activity levels. The Department of Health (DoH 2009) document on getting the nation moving, stresses the importance of considering that physical activity can range from everyday activity such as gardening to organised competitive sport and the greatest reduction in health risk is to move people from being totally inactive to active, small changes will make a big difference.

1.1.3 Negative effects of physical inactivity

Research has demonstrated that there is a strong link between physical inactivity and an increased risk of disease. For example, those who are less active are more likely to suffer from heart attacks, strokes and some cancers (World Health Organisation 2002). There are also many positive benefits of physical activity discussed in more detail in section 1.1.8.

1.1.4 Current government recommendations for physical activity

Despite the known positive benefits of physical activity there are still relatively few people in the U.K meeting the Chief Medical Officer's recommendations for physical activity. These recommendations are that individuals should carry out at least 30 minutes of moderate activity on at least 5 days a week to achieve a positive health benefit (DoH 2004a). The Chief Medical Officer (DoH 2004a) and The Welsh Assembly Government (2003) report that shortened bouts of 10 minutes of activity dispersed throughout the day are just as effective as 1 longer 30 minute session. The World Health Organisation (2010) recommend that adults between 18 and 64 should carry out 150 minutes of moderate intensity aerobic activity or carry out 75 minutes of vigorous intensity activity throughout the week or an equivalent combination of moderate and vigorous intensity activity to meet targets. This aerobic activity should last at least 10 minutes to contribute towards health benefits. To place the World Health Organisation's (2010) recommendations into perspective, they provide a definition of what moderate and vigorous intensity activity includes. Moderate intensity activity is defined as activity that is performed at 3-5.9 times the intensity of rest or an exertion effort of 5 or 6 out of 10 for an individual. Vigorous intensity activity is defined as activity that is performed at 6 or more times the intensity of rest and would be a 7 or 8 out of 10 on an individual's exertion scale (World Health Organisation 2010). They also give examples of appropriate aerobic physical activity as; swimming, brisk walking, running, dancing or any activity that leaves an individual out of breath and with an increased heart rate above resting. For the purpose of this study the Chief Medical Officer's

definition of physically active was used as it is most relevant to the setting of the study.

A report by the Information Centre (2010a) states that in 2008 only 39% of men and 29% of women reported meeting the government targets for physical activity. It has also been reported that physical activity declines rapidly with age as only 17% of men and 13% of women in England between 65 and 74 meeting recommendations for physical activity (National Centre for Social Research 2004). These figures suggest that as a nation we are not very physically active which may have a detrimental effect on our health.

1.1.5 Health inequalities and physical activity

There is a demonstrated link between health inequalities and physical activity. In a government report for 2003-2005 life expectancy in areas of deprivation and poor health was 2 years less for men and 1.6 years less for women (Government National Sustainable Development Indicators 2006). When compared with the general population in England; Indian, Pakistani, Bangladeshi and Chinese men and women are less likely to meet physical activity recommendations than non minority ethnic groups. For example only 26% of Bangladeshi men meet government physical activity recommendations and 11% of women (British Heart Foundation 2007) compared to 39% and 29% respectively in the general population (The Information Centre 2010a). The government response to physical activity and health inequalities was in the White Paper, Choosing Health (2004b). The paper aimed at reducing

health inequalities in health such as targeting physical activity interventions at workplaces to reduce inequality in access to services.

1.1.6 Physical Activity and sickness absence

1) Sickness absence due to inactivity in the UK

Studies have shown that inactivity leading to obesity has a large impact on workplace sickness absence within the U.K. Ferrie et al (2007) conducted a longitudinal study of a working population. They measured BMI at different time intervals and found that an overweight or obese BMI in phase one of the study was linked to an increase in workplace absences later in both men and women. Neovius et al (2009) found similar results, obese staff in European workplaces had on average 1-3 more sick days per year than their healthy weight counterparts. This increased workplace absence has been shown to decrease if physical activity increases. Pronk et al (2004) found that increasing physical activity reduced days of absence and also increased the quality of an individual's work performance. This workplace absenteeism due to physical inactivity could be reduced through the implementation of workplace wellness programmes. Workplace wellness programs have been shown to produce savings for businesses (Baicker et al 2010) through decreasing absenteeism (Aldana et al 2005 and Parks and Steelman 2008) and also increased job satisfaction for employees (Parks and Steelman 2008).

2) *Sickness absence due to inactivity in NHS employees specifically*

Physical inactivity and workplace absence is also a problem among NHS staff. The national sickness rate for NHS employees in 2009 was estimated at 4.05% days per year but nurses had a higher sickness rate at an estimated 5.04% (The Information Centre 2009). A more recent survey of electronic staff records reported sickness rates of 3.89% a decrease from 4.05 % (The Information Centre 2010b). However, nurses still remain the third highest group for sickness absence (4.76%) with the East Midlands being the second highest in the U.K, 4.25% (The Information Centre 2010b). Although sickness rates are reducing it is not as significant as in the private sector. The Boorman Report (Boorman 2009) suggests that on average NHS staff have more sickness days per year (10.7) than the private sector (6.4) and the rest of the public sector (9.7). High nursing staff sickness rates cost the NHS an estimated £90.5 million a year (Williams, Michie and Pattani 1998) which is financially significant for those who pick up the cost such as the government and tax payers (Johnson, Croghan and Crawford 2003). Williams et al (1998) suggest that a 1% reduction in annual sickness rates, the equivalent of two half days per nurse would save the NHS £140 million per year. There are already attempts in place to tackle this problem. One such programme is Q Active and is currently running at a large midlands teaching trust. The programme runs fitness and health classes with the aim for staff to feel better and therefore work better (Lee, Batt, Mortimer, Blake and Booth 2008). The executive summary reported increases in lifestyle leisure activities of the Trust's staff. This is significant at such a large teaching trust because any intervention even with a small proportion of staff will actually include

large numbers of people (Lee et al 2008). If physical activity among NHS staff can be increased then there will be savings for the NHS.

1.1.7 Environmental Issues

There is very limited academic research on physical activity and environmental outcomes. However there is research to show that increasing walking or cycling decreases a countries carbon footprint. However, both cycling and walking rates have decreased by 26% in the last 25 years (DoH 2004a and DoH 2009). There is also a link between the aesthetics of an environment and the need for green spaces for exercising (Humpel, Owen and Leslie 2002). Further discussion is beyond the scope of this dissertation.

1.1.8. Self efficacy and physical activity

The concept of self efficacy was developed in the social learning theory set out by Arthur Bandura (Bandura 1977). He suggests that humans learn through the consequences of their actions either positive or negative re-enforcement. Bandura (1977) defines self efficacy as the belief that one is able to carry out an action to produce a desired outcome. In short it is a person's self belief that they can carry out a behaviour. A person's level of self efficacy will determine the amount of time and effort they will put in to overcome barriers within that activity (Bandura 1982). Taber, Meischke and Maciejewski (2010) carried out a study on self efficacy and physical activity among college students and found that self efficacy was a predictor of exercise levels. Taber et al (2010) also reported that any strategies aimed at

increasing exercise should be aimed at increasing students coping abilities with barriers to exercise. Further literature support for the impact of self efficacy on exercise behaviour shows a link between an individuals level of self efficacy and their physical activity level (Sidman, D'Abundo Hritz 2009 and Neupert, Lachman, Whitbourne 2009, Young-Shin , Cloutier-Laffrey 2008, Bandura 2004, Von et al 2004).

1.1.9 Benefits of physical activity

Physical activity has many positive benefits to an individual. These are wide ranging but include decreasing the likelihood of developing cardio vascular or peripheral diseases, stroke prevention and altering unhealthy blood pressures (DoH 2004a). The specific disease benefits of physical activity are discussed 1.1.9.2.

1.1.9.1 Mental Health Benefits of physical activity

Physical activity has been shown to improve an individual's mental health by reducing the incidence of clinical depression, creating healthier sleep patterns and giving an individual a greater sense of self achievement (DoH 2004a). Further mental health benefits of physical activity are suggested by Ryan (2008) who reported that physical activity can have a similar effect to pharmacological intervention in clinical depression. However, Ryan (2008) failed to separate the influence of social factors from increased physical activity contributing to decreased depressive moods. Within the literature there is debate about why physical inactivity may lead to negative mood. Booth (2002) claims that negative moods occur because

activity levels fall causing gene mutation and possibly a reduced immune response that allows certain diseases to manifest themselves. The mental health benefits of physical activity among university students were studied by Taliaferro et al (2008). They found that students who engaged in physical activity each week showed a reduced risk of helplessness, depression and suicidal behaviour than their non-active counterparts. However it was unclear whether increased physical activity decreased suicidal behaviour or whether the suicidal behaviours initially decreased physical activity participation. The literature demonstrates that physical activity has positive mental health benefits.

1.1.9.2 Disease specific benefits of physical activity

The disease specific benefits of physical activity are well demonstrated and wide ranging. A World Health Organisation (2002) report estimates that in developing countries, physical inactivity is responsible for 22-23% of Coronary Heart Disease related deaths, 16-17% of colon cancer occurrences and 15% of diabetes mellitus cases. McPherson et al (2002) found that 37% of heart disease can be attributed to inactivity.

Renal

Studies have shown that there are disease specific benefits of exercise among dialysis patients. Zheng et al (2010) demonstrated that dialysis patient's found increased physical function and improved quality of life as a result of increased physical activity. Another study of renal failure patients report that increased

exercise can increase the efficiency of dialysis and improve patient outcomes (Sun et al 2003).

Hypertension

A study has shown that increased exercise decreases the need and dose for anti-hypertensive medication (Miller et al 2002) and can also reduce prevalence of hypotensive episodes in patients with pre-existing hypotension (Painter et al 2000). Regular physical activity has also been shown to decrease the relative risk of hypertension by 19-30 percent (US Department of Health and Human Services 1996).

Diabetes

There is also evidence for increased blood glucose control and an improved lipid profile in diabetes mellitus patients (Houmard et al 2004). Physical activity has been shown to prevent type II diabetes (Knowler et al 2002). There is also research evidence to support that physical activity leads to increased insulin sensitivity in diabetics, leading to lower insulin prescriptions and improved insulin function (Wannamethee et al 2000).

Coronary Heart Disease and Cardiac Rehabilitation

The benefits of exercise in relation to Coronary Heart Disease (CHD) are summarised by Wise (2010) as increased maximum cardiac output, increased body

weight control which has many associated health benefits such as decreased insulin resistance. This meta-analysis study also reported increased fitness and strength, increased exercise capacity which may contribute to a decreasing likelihood of recurrence of cardiovascular episodes and therefore readmission to hospital. The positive effect of exercise in cardiac rehabilitation is further supported by Taylor et al (2004) whose study reported that exercise can reduce mortality by 20% and exercise based rehabilitation can reduce readmission, although it was unclear to what extent (Ades, Pashkow, Nestor 1997). Leisure time physical activity has also shown to have a beneficial impact on those who already have CHD and can decrease mortality in this group (Apullen et al 2008).

Cancer

Physical activity can also risk the risk of developing cancer especially colon cancer where individuals are 40-50% less likely to be diagnosed with this type of cancer if they are physically active (DoH 2004a).

There is a large body of evidence that relates to specific disease groups and the benefits of exercise although the literature has only been reviewed briefly as they are not within the scope of this study.

1.1.10 Social Support and Physical Activity.

The influence of peer support on health choices has become a larger part of health promotion (Dennis 2003). This idea is supported by the World Health Organisation

(1998) which mentions strengthening social support networks as a strategy for health promotion. The link between social support and health choices is further supported in research by Stewart and Tilden (1995) who concluded that enhancing interpersonal relationships will enhance health. The Department of Health (2010) released a publication about NHS Staff Sport and Physical Activity which aims to get more NHS staff physically active. The publication sets out a strategy to help get staff more active and specifically mentions the social benefits such as an enhanced level of inter-professional communication and staff bonding as a result of organised sport. Research on social support and health behaviours in college students has concluded that peer support has a greater influence on physical activity than parental or family support and that females report a higher social support influence than males (Gruberk 2008 and Goltlieb and Baker 1986). Gruberk (2008) reports that females receive more criticisms for their actions than males do and that males report higher levels of social support when the majority of their friends are female. These findings suggest that females may have a higher level of social support for exercise and that this social support has more influence on their actions. This is significant as a high proportion of NHS nurses are female (WHO 2008) and so interventions to increase their physical activity should include the influence of social support factors. However, Gruberk's (2008) used a predominantly African-American sample which may mean direct comparisons are not possible with other populations. More evidence for the role of social support and exercise adherence comes from Dubbert 1982 and Dishman, Sallis and Orenstein 1985 with both studies reporting that having a spouse who was supportive of positive exercise behaviours increased the likelihood of the behaviours occurring. The literature

shows a positive link between higher levels of social support and more positive exercise behaviours.

1.1.11 Benefits and Barriers to physical activity- The Health Belief Model (Nutbeam and Harris 1998).

Many researchers have looked at benefits and barriers to physical activity. Some of these benefits and barriers were; lack of time, involvement in technology, safety concerns, access to facilities and body centred issues (Robbins 2009 and 2003 and Dwyer 2006). Wen et al (2002) reported that benefits and barriers differ between males and females and Dwyer (2006) also reported that differences occur with age, peer influence and level of self efficacy. Sirard (2006) reports that males suggested competition, social factors and fitness as the main benefits for being physically active whereas females reported social factors and increasing their skill level as the most important benefits. Brown (2005) explains perceived benefits to be an individual's evaluation of any potential gains from engaging in particular health behaviours in this case exercise. Perceived barriers are an individual's evaluation of potential obstacles that may stop a person engaging in particular health behaviours. This notion has been included in many models of health behaviour most significantly the Health Belief Model (Janz and Becker 1984 and Rosenstock, Steecher and Becker 1988). As Figure 1 shows the health belief model involves an individual's perceived susceptibility to a problem, how serious they perceive the problem to be and any benefits and barriers to carrying out an action all affect the likelihood of an action happening. The Health Belief model is useful within the scope of this study as it was originally developed to understand why people did not

use health services. This study looks at reasons why individual's may not be physically active and attempt to suggest reasons for this (Tones and Tilford 2001).

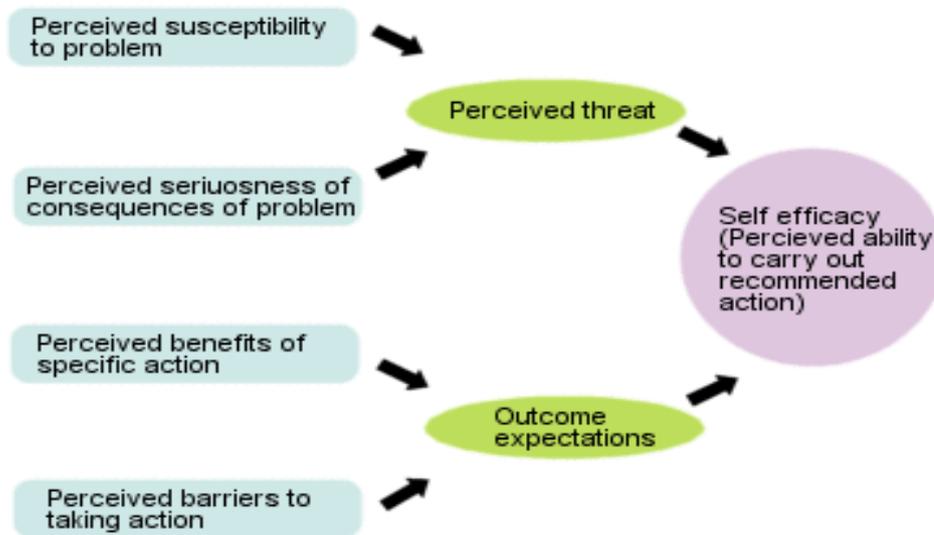
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To link this model to physical activity;

- ◆ Susceptibility of the problem: what affect inactivity would have on an individual for example if they are a healthy weight they may feel that inactivity will not affect them badly.
- ◆ Perceived seriousness of problem: How serious the effects of inactivity will be to an individual.
- ◆ Perceived benefits: social aspects, physical and mental health benefits
- ◆ Perceived barriers: lack of time, energy or areas to be physically active.

These factors are considered by an individual and if the perceived threat of inactivity is high and expectations of positive outcomes are high (e.g. benefits outweigh barriers) then an individual will become physically active. Another important factor with The Health Belief model is that a trigger is required to initiate action or change (Tones and Tilford 2001). An example of a trigger for initiating physical activity change would be gaining weight or a health promotion intervention possibly through the nursing profession.

Figure 1: The Health Belief Model (Adapted from Nutbeam and Harris 1998).



1.2 Background/Rationale for physical activity in NHS staff:

1.2.1 Nurses as role models for health

Given the recent government emphasis on increasing physical activity in the UK, it has been recognised that NHS staff should set the example for a health lifestyle. Richter (1987) suggests that nurses need to increase their interest in their own health before they can attempt to alter a patient's health status.

1.2.1.1 NHS Staff Health and Wellbeing

The 2009 Boorman Report from the Department of Health (Boorman 2009) suggests that staff health and well being is important because it affects patient safety, patient experience and the effectiveness of the care provided by healthcare professionals. He suggests that NHS trusts should be proactive to lower staff sickness rates by developing strategies alongside national policy to increase

workplace wellness. For example encouraging active travel to work, by providing appropriate facilities for cycling and walking such as showers (DoH 2004a).

In response to the Boorman report (Boorman 2009) a new initiative has been launched by the NHS. This initiative is run by NHS sport and physical activity (<http://www.sportandphysicalactivity.nhs.uk>) and promotes organised sport within NHS trusts as a way to increase the physical activity levels of staff. The scheme includes organising leagues of many popular sports such as tag rugby and netball. It also emphasises the importance of physical activity among colleagues as increasing physical fitness but also creating opportunities for teamwork and an opportunity for social recreation outside the workplace (NHS Sport and Physical Activity 2010). The programme was evaluated as being successful in a case study report and found that initiating an organised sport league was increasing staff motivation at work, increased their motivation to get fit, 83% improved their working relationships and 95% enjoyed being part of an organised sporting activity (NHS Sport and Physical Activity 2010).

1.2.1.2 Why should nurses adhere to their own advice?

A growing role for nurses within the NHS is that of health promotion for their patients (Clarke 1991). Nurses are required to set an example to the general population by carrying out positive health behaviours. This idea comes from the belief that others are more likely to follow advice if they believe that the health professional is carrying out the behaviour themselves (Callaghan 1995). This is significant because if service users do not comply with treatment or advice given to

them then it is costly to the NHS (Ley 1988). Additionally if nurses are not compliant with healthy behaviours then they are more susceptible to conditions which may inhibit their role as a health promoter or fitness to practice (Callaghan 1995). Callaghan carried out a later study (Callaghan 1999) to look at what health behaviours nurses viewed as most important to provide a role model for. He carried out a cross sectional survey and found that the 3 most important health behaviours were; not drink driving, condom and seat belt use. All these behaviours are not behaviours where it would be easy to provide a good role model for patients as they are private behaviours not related to work. Regular exercise was rated as the 8th most important health behaviour among these nurses suggesting that it is not a priority for role modelling. This study did use convenience sampling and so it is not definite that the sample gained is representative of the nursing population and so large generalisations are not possible. A qualitative study was carried out by Rush et al (2005) who found that the nurse participants described themselves as “having to be perfect” and some felt threatened by the high expectations, however many of them felt that it provided an ideal to strive for. There was agreement that nurses should be good informational resources for patient’s and should practice what they preach in order to provide effective health promotion. Clarke (1991) warns that this added pressure on nurses to be role models to their patients may add unnecessary stress to an already stressful profession. The literature suggests that nurses should be physically active to provide a good health role model but do they practice what they preach?

1.2.1.3 How physically active are nurses?

There is conflicting evidence within the literature about how physically active nurses are. McDowell (1997) found that European practice nurses met recommended physical activity levels in 60.2% of cases which is above the average for the general population. However practice nurses do not work the same disruptive shift pattern as hospital nurses which may have increased their physical activity. A number of studies have found no difference between physical activity levels of nurses and the general population such as Pratt (1994) and Robbins et al (2004) who found no significant difference between the physical activity levels of nurse practitioners and the general population. Brox and Frøyskin (2005) also found no significant difference when comparing levels of registered nurses physical activity levels with the general population. However their intervention only used light stretching activities once a week and so may not have been enough to increase physical fitness.

Tucker, Harris, Pipe and Stevens (2010) found that in a sample of registered nurses; 50% meet or exceeded government targets for physical activity, 45% fell below recommended physical activity levels and 6% reported rarely or never doing exercise. These reported levels are higher than previously stated for the general population and may show higher levels of physical activity among nurses. The main limitation of this study was that it was a self report study and so there may have been an element of social desirability leading to an over estimation of the physical activity levels of nurses. Zapka, Lemon, Magner and Hale (2009) measured the body mass index (BMI) of 194 nurses and conducted a survey. BMI was found to be above 25 which is considered to be overweight (WHO 1995) in 65.4% of the

respondents. Men reported a higher intake of fruit and vegetables and more walking on breaks than females did. Nurses with less education were more likely to walk on breaks than nurses with more education. These results suggest that male nurses have better health behaviours than females and that health behaviours are not determined by level of education. This study has limitations such as a small sample size 194 although 405 nurses were approached. The gender differences may be overestimated as it is not clear how many males were in the study and whether this ratio was typical of the national nursing population. One study was highlighted that found no significant difference in the benefits of carrying out physical activity or not in a health professional population.

1.2.1.4 Comparing nurses with other healthcare professionals

There is less published evidence for doctors regarding their physical activity levels and whether this has an effect on their practice. Frank (2000) reported that physicians are more likely to tackle patients on their inactivity if their own activity levels are satisfactory. McKenna, Naylor and McDowell (1998) found that General Practitioners (G.P's) were less likely to regularly promote physical activity in consultations if they were less physically active themselves and if patient's stated lack of time or lack of incentive as a barrier for not already participating. This may show that a lower level of physician physical activity means less encouragement for patients to be physically active. However the effect of personal physical fitness levels was more prominent in practice nurses. Practice nurses are four times more likely to promote physical activity participation in consultations although the study does not report the level of physical activity among the practice nurses so it is hard

to estimate whether G.P's or practice nurses are more physically active but they did report personal activity levels having more of an influence of nurses health promotion.

1.2.1.5 International Comparisons on the activity levels of nurses

International comparisons of nurse's physical activity levels show that nurses in the U.K generally have lower physical activity levels and poorer health behaviours than the rest of the Europe. Friis (2005) conducted a study of Danish nurses compared to a matched group of women in the general population for socioeconomic status and age and found that the nurses smoked less and carried out more physical activity in their leisure time but had an increased alcohol intake. They also found that a smaller number of nurses have a BMI of 25 or above compared to the general population 34.8% and 41.6% respectively. However they did find that nurses used the health service more although this may be due to increased awareness. This study is very useful within this debate as it had a high response rate and compared many health behaviours.

The Canadian Institute for Health Information (2007) found that 90% of practising nurses had good physical health and 94% reported having good mental health. Despite these findings the nurses still reported having an average of 13.8 – 17.2 sick days per year higher than in the U.K (The Boorman Report 2009). This was a self report study and so nurses may have overestimated their levels of physical activity for social desirability or there may not have been an agreed structure for reporting physical activity levels. Persson and Martensson (2006) conducted a study in Sweden to assess diet and exercise habits in nurses who mainly work night shifts.

The main findings from this study were; a decreased ability to have regular eating habits, colleague support for exercise increased participation. Colleague support for exercise shows the impact that social support has on positive health behaviours. The nurses also reported benefits of working nights to participating in physical activity such as; the freedom to carry out activities during the day. Nurses also reported that exercise helped them to decrease the stress from a shift and made them feel more alert at night. This study was conducted on a small sample of community nurses and the interviews were conducted in a holiday period and so the nurses may have had a more positive outlook on their behaviours.

The Undertaking Nursing Interventions Throughout Europe Study Group (2002) found that self reported exercise was higher and Body Mass Index was lower in the rest of Europe than the U.K. This study has limitations such as a predominantly white middle class population and was conducted with a very small sample of predominantly community nurses. These factors may have affected the research and so findings should not be overestimated.

Dittmer et al (1989) conducted a study of staff nurses in New York and found that the nurses were not good examples of positive health behaviours and also had an increased smoking rate, irregular eating habits and increased binge drinking behaviour. However Booth and Faulkner (1986) found that smoking rates among staff nurses were similar to that of the general population so maybe the extent of poor health behaviours in U.K nurses is overestimated when comparing with U.S studies.

1.2.1.6 Health behaviours of university students

Physical activity and general health behaviours in university students has been extensively studied. There is a strong evidence for the effect of transition to university on physical activity levels. Von et al (2004) reports that transition to university is a stressful life change with increased work load, change in social situation and level of independence and so this is an ideal time to stage an intervention in students physical activity levels. However, Kwen (2009) reports that although students identified this as a good time to change they were rarely able to sustain changes. Keating (2005) suggests that students have adult responsibilities and so will carry on physical activity patterns established whilst at university for the rest of their life. This may be especially true for nursing and medical students due to the vocational nature of the structure of their courses. They will learn to adapt physical activity patterns to their working patterns early on in their career.

Nigg et al (2009) studied health behaviours of college students and found that physically active students smoked less than their less active counterparts. However they also found that more physically active students consumed more alcohol than non-physically active students. This may be due to the link between alcohol and organised university sport. Thombs (2000) reported that in the two weeks previous to his study 44.9% of the students reported drinking five or more drinks on at least one occasion.

1.2.1.7 Health behaviours of healthcare students

To compare the physical activity levels of nursing students to their non-nursing university counterparts a review of the physical activity levels of student nurses is needed. Soeken et al (1989) studied coherence to preventative health practices in 139 final year nursing students to that of 228 members of the general female population. They found that nursing students were less compliant in 12 out of 19 behaviours. They did not report any potential reasons for this but they did not look at occupation or work load of the general population.

Research has shown that relatively few university students have a sense of health responsibility (Lee 2005) thereof reusing the idea of the health belief model, very few feel that they are susceptible to the impact of inactivity. Some studies have shown that student nurses have better health than non nursing students (Boyd 1988, Haddad 2004). However there are also a number of studies that have reported no significant differences between nursing and non nursing students in physical activity levels (Lawrence 1993 and Clement 2002). Shriver et al (2000) explain that student and qualified nurses are expected to be role models and Stark et al (2005) report that nurses sometimes sacrifice their own health when caring for others although caring for others may provide a resource for how to care for themselves. They also report that teaching health promotion in the curriculum can alter negative health behaviours of students although Clement (2002) says that the positive outcomes of a nursing course may be eliminated by the higher academic stress levels. Staib (2006) studied 159 nursing students and found that nurses lack positive health behaviours and are worst in the areas of physical activity levels and nutrition, 81% studied did

not government physical activity recommendations. The literature suggests that nursing students have lower levels of physical activity than the general population.

The literature suggests that medical students are more likely to meet government physical activity recommendations. Frank (2004) found 64% of medical students studied met government recommendations and also Frank (2008) found medical students carried out more physical activity than their matched general population counterparts.

1.3. Summary

There has been a recent focus within government policy surrounding increasing population physical activity especially within the NHS staff workforce. Physical inactivity has been shown to have negative health implications and a knock on effect on the economy through increasing obesity levels and staff sickness absence. There are also many positive health benefits and many disease specific benefits. There is evidence within the literature about the impact of social support and self efficacy and physical activity levels. The health belief model can explain to an extent an individual's intent to be physically active. There is a recent focus on increasing NHS staff physical activity. The literature suggests that this is necessary as nurses should provide a positive health role model for patients. Current physical activity levels of nurses are low and are also low for student nurses. These need to be increase dif nurses are to provide a positive role model for their patients.

Chapter Two: Methodology

2.1. AIMS

2.1.1. Primary Aim;

To assess physical activity levels of undergraduate nursing students and to identify any benefits and barriers to their physical activity participation.

2.1.2. Secondary Aims;

1. To identify the level of social support from family and friends for carrying out physical activity in undergraduate student nurses and to examine whether this significantly affects physical activity level.

2. To assess self efficacy levels of undergraduate student nurses for physical activity and to examine whether this significantly affects physical activity level.

3. To assess gender differences in physical activity participation, level of self efficacy, benefits and barriers for physical activity and levels for social support

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2.2. Ethical considerations

2.2.1 Online surveys

Online surveys often present less ethical problems than laboratory based experiments. Nosek et al (2002) state that in online surveys the possibility of

coercion by the researcher is removed but there is a limited opportunity to fully debrief participants.

Online surveys tend to underestimate populations that have little access to the internet although this was not a problem in this study be a problem as all participants are enrolled at the University of Nottingham and so have equal access to the University internet facilities.

2.2.2. Confidentiality

Computer held data including the study database was held securely and password protected. All data was stored on a secure dedicated web server. Access was restricted by user passwords (encrypted using a one way encryption method). Electronic data was backed up regularly to both local and remote media in encrypted format.

Paper formats of the survey were stored in a locked cupboard that only the dissertation supervisor has access to. All information provided was anonymous as participants cannot be identified through any responses they provided. The paper and online versions of the survey included a covering healthy volunteer's information sheet or first page of the online survey. This information sheet provided details of the main measures of the study, background to the purpose of the study, details of right to withdraw, details of an possible disadvantages of taking part, details of how information is kept private once obtained and what happens to the research once collected. There were also contact details if any individuals would

like to make a complaint or has any concerns and these details are for the student and also dissertation supervisor.

2.2.3 Ethical Approval

Ethical Approval was gained through submitting ethical approval forms to The University of Nottingham, School of Medicine and Health Sciences Ethics Committee Board. Ethical approval was gained on 24/02/2010. A consent form was not deemed necessary by the ethics board as a detailed information sheet was included with both forms of survey. Informed consent was taken to be continuing with the online survey or completing the questionnaire after reading the information sheet. For a copy of the ethical board approval letter please see appendix 1.

2.3. Study Design and Methods:

2.3.1 Quantitative vs. qualitative

Quantitative research methods are based within the science paradigm (Maxim 1999). This method involves collecting, analysing, interpreting and writing up the results of a study. It has a main aim of testing objective theories through examining the relationship between defined variables. This occurs through the measurement of variables using structured instruments which finally produce numerical data from a representative sample. This numerical data is then analysed using statistical methods to arrive at conclusions. It is the aim that these conclusions should be met without bias from the researcher and the study should be carried out controlling for

alternative explanations to the findings. The end results of a quantitative study should be useful for making generalisations and it should be possible to replicate findings. The aim is to link findings to relationships between variables (Caputi and Balnaves 2001 and Cresswell 2009).

Qualitative methods or studies are based on the idea of collecting open ended data giving respondents a chance to lead the direction of the research. A purposeful sample is selected for the research process. The method involves the analysis of text to find common themes. It has input and interpretation of the findings by the researcher and building up general or common themes throughout the text. The main aim is to explore and understand the meaning that individuals place on problems and life situations. The write up and methodology will have a more flexible structure and will be inductive in style and aim to add personal meaning to the findings. The aim is to explore the complexity of the situation not to simplify events (Caputi and Balnaves 2001 and Cresswell 2009 and Silverman 2010).

A quantitative approach was used within this study because the aim was to collect a large amount of data. Another aim was to be able to make generalisations from this data to help inform physical activity interventions.

2.3.2 Design:

This research was a single centred, cross sectional questionnaire, online or paper survey that used a convenience sample of undergraduate nursing students at one university centre. The survey assessed whether a participant met current government

recommendations for physical activity, the benefits and barriers they reported for engaging in physical activity, their self efficacy for engaging in physical activity and social support from family and friends for engaging in physical activity.

Participants were offered the option of completing an online questionnaire through an invitation e mail sent out via the nursing course administrators or a paper version of the same questionnaire. Students were approached within designated lecture periods after gaining permission from the lecturer. The study was explained to participants and then a copy of the questionnaire left for them to complete in their own time. Questionnaires were then collected at the end of a lecture session. This limited any coercion from the author and gave participants the opportunity to withdraw from the study at any point. Both the online questionnaire and the paper version consisted of a front sheet with an invitation paragraph and then healthy volunteer's sheet with information about the study as discussed before.

2.3.3. Cross sectional survey/ questionnaires

The option of an online questionnaire was chosen because there has been a recent increase in internet use (Fox et al 2001, Horrigan 2001, Nie and Erbing 2000). There has also been an increase in the use of online surveys by researchers to reach the vast online population. There is also a range of software or online survey generators that help to create a survey fast and at ease to the researcher (Wright 2005). The advantages include; having access to those in a distant location, reach those who are difficult to contact i.e. those nursing students in clinical placement at time of data collection, automated data collection and decreased time for data

collection. More advantages associated with using an online survey include; saving time as it allows the researcher to carry out other tasks at the same time as data collection. There is also a decrease in the cost of computer hardware making it more accessible to the whole of society (Fox et al 2001 and Nie et al 2002). There are also problems with online surveys concerning the validity of the sample, is the person answering the questionnaire who you think they are? Another problem with survey design is that many survey design sites will only allow a narrow range of templates to be used restricting the researcher (Wright 2005). It should also be considered that not everyone has access to a computer or is able to access the survey due to compatibility issues with different operating systems. For this reason a paper version of the questionnaire was also used, however individuals were informed to only complete the questionnaire once. (Drummond, Ghosh, Ferguson, Brackenbridge and Tiplady 1995) carried out a comparison for web based and paper surveys within healthcare research and found that 57% of the sample preferred the web based questionnaire, 13% the paper based questionnaire and 30% had no preference. Both the web based and the paper questionnaires were reported easy to use and data was more complete on the online questionnaire (100% vs. 99.1%). The advantages of written questionnaires are well documented. They are summarised effectively by StatPac Inc (2010). They explain that written questionnaires are very cost effective for large sample sizes such as this study (n=469), they are easy to analyze and familiar to many people. They also involve less researcher bias when analysing as response are coded into numerical data and so is coded objectively. One criticism of written questionnaires is that they are unsuitable for populations who may not be literate. This was not deemed a problem in this study as participants

were all members of The University of Nottingham and so can be presumed to have adequate literary skills.

2.3.4. Participants:

2.3.4.1 Inclusion criteria from sample population:

- ◆ Over 18 years of age

- ◆ Currently undertaking a full time pre registration nursing course at The University of Nottingham, School of Nursing. Midwifery and Physiotherapy.

2.3.4.2 Exclusion criteria from sample population:

- ◆ Anyone under the age of 18 years

- ◆ Those on post registration nursing programmes as the study is looking at the barriers and determinants of those on a full time undergraduate nursing course.

- ◆ Those undertaking a sandwich or extended nursing course as the difference in course structure may affect the results produced.

- ◆ Those undertaking an undergraduate nursing course that are affiliated with the Nottingham University School of Nursing, Midwifery and Physiotherapy but are not based at the University of Nottingham School of Medicine and Health Sciences faculty full time.

2.3.4.3. Sample Population:

Information gained from administrative staff at the beginning of the data collection period (July 2010) of all current full time undergraduate nursing students at the centre.

The numbers of these students and response rates are as follows;

Table 1 Sample population and questionnaire response rates

Course	Total Sample Population Year 1	Total Sample Population Year 2	Total Sample Population Year 3	Total Sample Population Year 4	Total Per Course
Master Of Nursing Science	62	58	58	58	236
Diploma/BSc Pathway	311	256	331	N/A	898
Total	373	314	389	58	1134
Total Responses per Year	182	68	164	55	469

2.3.5 Setting:

The study was a single centred study based at the University of Nottingham Faculty of Medicine and Health Sciences and specifically within the School of Nursing, Midwifery and Physiotherapy.

2.3.6 Main Measures:

The design of the questionnaire is outlined below and the online and paper versions of the survey had the same format, a full copy of the questionnaire is available in appendix 2.

2.3.6.1. Demographic Information

Demographic information was requested to allow the author to look for links between this information and levels of physical activity, barriers and benefits to physical activity self efficacy and social support. Rationale for collecting demographic information is presented below.

A link between gender and physical activity has been reported by; Keating et al (2005), (Grieser et al (2006), Leslie et al (1999) and Taylor et al (1999), (Vu et al 2006), (Allinson, Dwyer and Makin 1999) and (Sirard, Pfeiffer and Pate 2006). The main differences found were in the level of physical activity, the type of activity with males preferring organised team sports and females dance or yoga activities. Girls were more likely to report the benefits as including opportunity to socialise (Grieser et al (2006), Leslie et al (1999) and Taylor et al (1999). Girl's barriers were

more likely to include lack of skill or other interests (Vu et al 2006) or a fear of upsetting physical appearance such as make up (Leslie et al (1999) and Taylor et al (1999). Males reported the opportunity for competition and increased level of fitness (Sirard, Pfeiffer and Pate 2006). Males also reported girlfriends or alcohol and drugs as a barrier more than females (Allinson, Dwyer and Makin 1999).

Year of Birth was asked for to establish whether there is a link between level of physical activity and age as the literature suggests that the transition to university can lead to attrition from physical activity (Von et al 2004 and Dinger and Waigand 1997).

Ethnic origin was asked as the literature shows a lower level of physical activity in ethnic minorities (Suminski, Petosa, Ulter, Zhang 2002 and Frenn, Malin, Villamuel, Slaikeu, McCarthy, Freeman, Nee 2005). For the purpose of showing results ethnic origin will be collapsed into two categories; White and Non-white. This is because research has shown that it is ethnic minorities that are disadvantaged within physical activity.

A question was asked about which undergraduate nursing course the responder is currently undertaking. This question was asked as there is a great opportunity to gain information at The University of Nottingham about those who are undertaking an undergraduate nursing course that follows a structure closer to that of other undergraduate subjects.

The last demographic question related to which year of study the respondent was in as research has shown that the initial transition to university cause attrition from

physical activity because of varying academic commitments, new financial pressures and lack of time management skills (Misra 2000).

2.3.6.2 Stages of Exercise Change Model (Marcus, Rokowski and Ross 1992).

Background

This scale is based on the Transtheoretical model of behaviour change (TTM) which was the original work of Prochaska and Velicer (1997) and was developed to measure smoking behaviour but has been adapted for use in exercise research (Prochaska and Marcus 1994). The original theory explains that any attempt to change a behaviour will pass through 6 stages (Table2); pre-contemplation, contemplation, preparation, relapse, action and maintenance. Pre-contemplation is a behaviour where an individual is in denial or has no intention to change, contemplation is seriously considering making a change, preparation consists of making small changes, action is actively changing the behaviour and maintenance is continuing with the successful behaviour change. It was first thought that movement through these stages was linear but recent research and testing of the model has proved that the movement is more cylindrical (Marcus and Simkin 1994) and that individuals will move back and forth through the stages before developing a stable behaviour pattern within one of the stages (Rhodes, Martin, Taunton, Rhodes, Donnelly and Elliot 1999).

Validity

Use of the TTM in exercise research was studied in a meta analysis by Marshall and Biddle (2001) who concluded that the staging measure is able to estimate an individual's level of physical activity for example those in the maintenance stage will have higher levels of physical activity than those in contemplation. Plotnikoff, Hotz, Birkett, Coumeya (2001) tested the internal validity of the TTM using a randomly selected group of adults who had had no exercise related interventions. They reported that in 45% of the cases they examined, the TTM was able to predict the physical activity level and the movement between stages of each participant.

Table 2 Stages of exercise change (Marcus et al 1992)

Maintenance – Yes to exercise and for more than 6 months
Action - Yes to exercise but for less than 6 months
Preparation - No to exercise but I intend to in the next month
Relapse - No to exercise but I used to 6 months ago
Contemplation – No to exercise but I intend to in next six months
Pre-contemplation - No to exercise and I do not intent to in next 6 months

Scoring

Original scoring was (1-2-3-4-5-6) from pre-contemplation stage to maintenance stage, which was collapsed to a bimodal response (1-2) for active/inactive.

Table 3: Study definition of respondents as active or inactive.

If a participant's reports being in the maintenance or action stage of exercise change then they meet government recommendations for physical activity and were counted as being physically active. If a participant's reports being in the preparation, relapse, contemplation or pre-contemplation then they do not meet government recommendations for physical activity and were counted as being inactive.

2.3.6.3 Exercise Benefits and Barriers Scale - EBBS (Sechrist, Walker and Pender 1987).

Background

The original measure was developed by Sechrist et al (1987) and contained 43 items. It has since been reduced with some items being collapsed together. The scale aims to assess the barriers an individual has to exercise, the benefits they perceive from exercise and whether they perceive more benefits or barriers to being physically active.

Validity

The original scale was psychometrically evaluated by Jang and Shin (1999) who found the benefits scale to have a Cronbach's coefficient alpha of 0.97 and the barriers scale 0.89. Sechrist et al (1987) report an excellent internal reliability with a Cronbach's alpha of 0.95 for the benefit subscale and 0.86 for the barrier subscale.

The test–retest reliability estimates were 0.89 for the benefit subscale and 0.77 for the barrier subscale. Jing and Shin (1999) also reduced the original tool from 43 items to 40 as some questions to overlap by an expert panel for example, “I will prevent heart attacks by exercising” and “Exercising will keep me from having high blood pressure” could be incorporated into one question. My spouse does not encourage me to exercise adds no more information than my family encourages me to exercise and so the later question is used. This study will use the adapted version of the exercise EBBS and consists of a 27 item benefits scale and a 13 item barriers scale.

Grubbs and Carter (2005) conducted a survey using the EBBS with collage undergraduates such as those in the sample population for this study. The demographics reported that students were either taking an undergraduate anatomy and physiology course or an ethics course run by the psychology department. This is significant for comparison to the results of this study as students in the Grubbs study were enrolled on course with a similar psycho-social background to the nursing students in this studies sample population.

Further evidence for use of the EBBS comes from Zheng et al (2010) who state that the EBBS is the only reliable and valid instrument to assess any perceived benefits and barriers to physical activity participation among the healthy adult population. This makes it relevant to this study because the sample population is that of University students not those from a particular disease group.

Scoring

The Scale is scored on a 4 point Likert Scale where each question is rated using this scale: 4= strongly agree, 3= agree, 2=disagree, 1= strongly disagree. Once complete all barrier items are scored in reverse and so the scale becomes 1= strongly agree, 2= agree, 3= disagree and 4= strongly disagree. A score is then calculated for each respondent by adding up their responses from question 1-40. The higher a total score on the EBBS the more perceived benefits to exercise they have. There is no given cut off point by the original authors to define whether an individual perceives more barriers or benefits and comparisons are made through comparing mean scores between individuals. The maximum score for the scale will initially be 160 but will be adjusted to 120 during data analysis as data will be analysed using a likert scale from 0-3 to allow for missing data alterations, described in full in section 2.3.7.4. Questionnaire Benefit and Barrier items are listed in table 4.

Table 4 Benefit and Barriers items on The Exercise Benefits and Barriers scale

Benefit Items = Question numbers	Barrier Items= Question numbers
1,3,6,7,9,10,13,15,16,18,19, 20,22,23,24,26,27,28,29,31, 32,33,35,36,38,40. Total Number=26	2,4,5,8,11,12,14,17,21,25, 30,34,37,39. Total Number=14

2.3.6.4 Self-Efficacy for Exercise Scale (Resnick and Jenkins, 2000)

Background

A scale for measuring self- efficacy for exercise was developed by Resnick and Jenkins (2000). Face to face interviews were used alongside other measures to assess the reliability and validity of the scale. The final scale consists of 9 items that respondent's rate on a Likert scale ranging from 0 – not very confident to 10 – very confident. Respondents are asked to rate how confident they feel they would be to carry on exercising in each situation see example question. If an individual has a higher locus of control then they are more likely to carry out healthy behaviours (Wardle and Steptoe 2001). If they feel in control of the situation then they are more likely to be physically active.

Validity

Validity was proved by the original authors as self efficacy predicted exercise level and exercise level predicted self efficacy in their initial testing. Internal reliability was proved with an alpha coefficient of 0.92. The study was originally validated for use with older adults but was used here with younger individuals as the scale does not include any items specifically related to the older adult which makes it useful for assessing self efficacy in a younger population.

The scale has been used by Taber et al (2010) with college students and they found that it was a useful tool and also accurately predicted levels of self efficacy in relation to levels of exercise.

Scoring

Each participant's score is added up for questions 1 to 9 and a final total gained between 0 and 90. A higher score indicates a higher confidence level and therefore a higher level of self efficacy for physical activity participation. Total scores range from 0-90.

2.3.6.5 Social Support and Exercise Scale (Sallis, Grossman, Pinski, Patterson and Nader 1987)

Background

A scale to measure the link between social support and exercise is being included in the study because the literature suggests that social support in any form (peer, parental neighbourhood) then the higher an individual's level of physical activity (Gruber 2008, Prochaska, Rodgers and Sallis 2002, Goltlieb and Baker 1986 and Treiber, Baronowski, Braden, Strong, Lewy and Know 1991, Dennis 2003).

To develop specific supportive and non-supportive behaviours the authors conducted interviews with 40 individuals (study I) to then be evaluated in study II. They interviewed only those younger than 45 therefore the scale is useful when studying university students as the majority will be under 45 years of age. Once the items had been developed any similar responses were collapsed into one answer and then a group of investigators determined the final set of questions and these were

used for reliability and validity testing in a different sample population. The final questions were a list of situations where social support would inhibit or initiate physical activity such as providing reminders about physical activity or encouraging physical activity.

Validity

The tests for reliability and validity were carried out using a sample population of undergraduate students and staff members of the research study. This means that the scale has been validated and proved reliable using a similar sample population to the current study. The final scale consisted of two separate scales that asked the participant to rate the level of social support received from family (one subscale) and friends (other subscale). The Coefficient alpha for the family exercise scale was 0.61 for the rewards and punishment questions and 0.91 for participation and involvement questions. The Friends exercise scale reported Coefficient alphas as 0.84, these were constructed using Cronbach's alpha to measure internal consistency. The reliability data reports that the test- retest reliabilities of the factors were acceptable ranging from 0.55 – 0.86 and the internal consistencies were high 0.61 – 0.91. These results indicate that most factors used are suitable for use in the subscale (Sallis et al 1987).

Scoring

The final scale consists of 13 questions each asking the respondent to rate their answer twice; once under family and once under friends providing two subscales;

friends and family. The answers are rated on a Likert scale as follows; 1= never, 2= rarely, 3= a few times, 4= often, 5= very often and 6= does not apply. The answer will be corresponded to a numerical value such as above although 6 will become a score of 0 as this indicates a low level of social support or the person is inactive. Family is defined as those living in the household although it is understood that in many university students this will be friends so it is stated clearly that those in your household are rated as family as you live with them and other friends or colleagues as friends. Once the data is analysed a higher score for each subscale will indicate a higher level for social support.

The measure has 13 items labelled A to M with separate scales for Family and for Friends. Scores are totalled by;

1. Family Participation = sum of family scales (a - m)
3. Friend Participation = sum of friends scales (a - m)

Total possible score for each person 0-65.

2.3.7 Data Analysis

All data analysis was conducted using SPSS statistical software package version 16.

To analyse the data Independent T-Tests and Chi Square tests were used.

2.3.7.1 T-Tests

An Independent T-Test is a uni-variate parametric test used to compare the means of populations that are assumed to have a normal distribution. The mean of a data set is taken to be the most common average and records the central value of the data (Salkind 2007). The test can compare continuous and binary variables; examples of continuous variables in this study are age of respondent and their year of study. In this study an independent means T-Test was used to compare whether a person is physically active or not compared to the other measures within the survey such as self efficacy for exercise scale score, social support scales score and EBBS scores (continuous variables). This method was used because individuals are allocated active (1) or inactive (2) making a binary variable and individuals have a continuous score from the completed survey scales. T-Tests are useful when analyzing large population data such as in this study (n=469) and when the continuous variables are normally distributed, if data is not normally distributed then finding the median would be a more effective method for analysis.

2.3.7.2 Chi Square

Pearson's chi-square test is a uni-variate non-parametric test used to see if there is a significant relationship between two binary variables (Field 2005). A chi square test

is used to examine whether a data set reflects hypothesised population proportions (Gravetter and Wallnau 2008). A Chi square test was used in the study because there is a relatively large sample population (n=469) and binary variables such as gender of a respondent.

2.3.7.3 Missing data.

Missing data was dealt with in a series of stages;

1. All data was recoded so that a missing value would = 0 so that all cases were included for analysis.
2. The total score for each person on a scale was calculated
3. For scales that were not scored from 0 then the total number of questions was deducted from a person's score to shift scoring to start from 0. For example; the social support family scale (Sallis et al 1987) has 13 questions and was scored from 1-6 so the equation was programmed to deduct 13 from everyone's score so that if they had originally scored a four they now had a three.
4. A total number of missing scores for each item on each scale was calculated and then a total percentage of missing answers for each scale was generated.
5. The highest possible score per item was then x by the total number of questions in a scale – the missing number of answers total for the scale and x by 100
6. This in effect creates a score for each person for each measure that has been adjusted by an individual's percentage of missing responses making it a more valid representation of their score for that measure.
7. For the social support for exercise (Sallis et al 1987) and self efficacy for exercise scales (Resnick and Jenkins 2000) an extra part was added to the equation that

meant that only those individuals with less than 5 missing answers were included for analysis. This was done because there were five cases where individuals had failed to complete these scales but had fully completed the EBBS (Sechrist et al 1987) and so were included in that analysis.

An example of the equation used for missing data handling is shown below.

Table 5- Example of the SPSS equation used to manage missing data

```
COMPUTE TB =(((sum (BB1R to BB40R))-(40-TTM))/(3*(40-TTM)))*100.  
EXECUTE.
```

Key:

TB= total score for the benefits and barriers scale

BB1R to BB40R= refers to the addition of all 40 benefits and barriers items

40= total number of questions in the exercise benefits and barriers scale

TTM= total number of missing responses for benefits and barriers scale

3= highest possible score per item after adjusting the scale to score from 0

*100= to achieve a percentage score adjusted for missing responses.

2.4 Summary

This study was carried within the quantitative research paradigm. It was conducted using a self report questionnaire survey containing standardised measures with proved reliability and validity. The data from these questionnaires was analysed and any missing data was accounted for. The findings from the research will now be presented.

Chapter Three: Results

3.1 Demographic Information

Table six displays the basic demographic information about the survey respondents. A total of 1134 student nurses are registered at this centre and all students present on days of data collection were offered the opportunity to take part in the study (41.3% invited to participate; n=469). A total of 469 questionnaires were returned to the author for analysis giving a return of questionnaire rate of 100% (406 returned paper questionnaire/ 63 online questionnaires).

The majority of respondents were female (n=376/ 80.1%) and also of white ethnic origin (n= 424/ 90.5%).

The most common marital status was single or living apart from spouse or partner (n= 377/ 80.9%). The most commonly held current qualification was A Levels or equivalent qualifications (n=387/ 82.5%). The demographic profile of the sample was representative of pre-registration nurses in the School. There were 205 students undertaking the Masters of Nursing Science Programme (43.7%), 163 undertaking the Diploma in nursing programme (34.7%), and 101 undertaking the programme (21.5%). The most common year of study of respondents was first year (n=183/ 38.8%) followed by third year (n=164/ 34.9%). The mean age of respondents was 23 years (SD=6.17) with the minimum age of participants 18 years and the oldest participant was 54.00, any link between demographic variables and level of physical activity are presented in table 7.

Table 6- Basic demographic information of respondents

	Variables	N (%)*
Gender	Male	93(46.8%)
N=469	Female	376 (80.17%)
Marital Status	Single*	377 (80.9%)
N=466	Live with partner	89 (19.1%)
Ethnic Origin	White	441 (94.23%)
N=468	Non-White	27 (5.77%)
Current level of qualification	Degree/Degree Level	34 (7.25%)
N=469	A Level or equivalent	324 (69.08%)
	Other Professional Qualification	5 (1.1%)
	O Level/GCSE or equivalent	39 (8.3%)
	Other	4 (0.9%)
Course	Master of Nursing Science	205 (43.7%)
N=469	Diploma in Nursing	163 (34.8%)
	BSc Pathway in Nursing	101 (21.5%)
Year of Study	One	182 (38.8%)
N=469	Two	68 (14.5%)
	Three	164 (35%)
	Four	55 (11.7%)
Age N=467 *percentages will not=100% as they have been rounded to 1 decimal place.	Mean= 23.03	SD= 6.19730

In the questionnaire participants were asked to specify their gender. The results of a chi square test showed that there was no statistically significant difference between males and females for levels of physical activity ($\chi^2 = 2.42$, $p = .120$, $n = 469$) or marital status ($\chi^2 = .192$, $p = .66$, $n = 466$) or ethnic origin ($\chi^2 = 11.58$, $p = .48$, $n = 468$). There was also no significant difference between level of qualification and physical activity levels ($\chi^2 = 3.94$, $p = .08$, $n = 469$). There was also no significant link between which nursing course they were undertaking and their level of physical activity

($\chi^2=6.77$, $p=.09$, $n=469$). A question was asked regarding the number of dependants an individual had however, the item was not completed by a large number of the study ($n=63$, 13.4%) and so it was felt that this should not be reported as a reliable report could not be made due to the missing data.

The relationship between year of study and age with physical activity level was calculated using an unpaired t-test and both produced non-significant results (Year of study $t=.498$, $p=.61$, $n=469$ and Age $t=.542$, $p=.58$, $n=467$). Both of these results show there is no significant link between age or year of study and physical activity level.

Table 7 Demographic Information related to whether a respondent was physically active or not

	Variables	Active	Inactive	P=
Gender	Male	45 (9.3%)	48 (10.23%)	.12a
N=469	Female	216 (46%)	160 (34.11%)	
Marital Status	Single	213 (45.7%)	164 (35.19%)	.66a
N=466	Live with partner	48 (10.3%)	41 (8.7%)	
Ethnic Origin	White	251 (53.6%)	190 (40.6%)	.48a
N=468	Non-White	10 (2.13%)	17 (3.63%)	
Current level of qualification	Degree/Degree Level Qualification	22 (4.6%)	12 (2.55%)	.08b
N=469	A Level or equivalent	217 (46.2%)	170 (36.24%)	
	Other Professional Qualification	2 (0.7%)	3 (0.63%)	
	O Level/GCSE or equivalent	19 (4.05%)	20 (4.26%)	
	Other	1 (0.21%)	3 (0.63%)	
Course	Master of Nursing Science	127 (27%)	78 (16.6%)	.09b
N=469	Diploma in Nursing	79 (16.8%)	84 (17.9%)	
	BSc Pathway in Nursing	55 (11.7%)	46 (9.8%)	
Year of Study	One	97 (20.6%)	85 (18.1%)	.61b
N=469	Two	42 (8.9%)	26 (9.6%)	
	Three	90 (19.1%)	74 (15.7%)	
	Four	32 (6.8%)	23 (4.9%)	
Age N=467	Mean= 23.03 SD=6.19730			.58b
a= a chi square test was used for analysis as variables were binary b= an independent t-test was used for analyses as variables were continuous				

3.2 Main Outcome Variable

Nursing student's levels of physical activity.

To establish the level of respondents who met government recommendations for physical activity and therefore were determined active, the response for the exercise behaviour change model was collapsed into a bi modal response (1= active, 2=not active). The results are as follows;

Table 8 Student Nurse levels of physical activity

Physically Active Participants: n=261/ 55.65%
Physically Inactive Participants: n=208 / 44.34%
Respondents: n=469 SD= .49

Table 8 illustrates that just under half of respondents were not meeting government recommendations for physical activity.

3.2.1 Outcomes of The Exercise Benefits and Barriers Scale (Sechrist et al 1987)

Table 9- Top five benefits and barriers to physical activity reported on the Exercise Benefits and Barriers Scale

Top 5 Benefits of exercise		Top 5 Barriers to Exercise	
Increases Physical Fitness	<i>N=469</i> M=3.47 SD=.54	Exercise tires me	<i>N=469</i> M=2.67 SD=.67
Increases cardiovascular function	<i>N=468</i> M=3.36 SD=.57	Too much money	<i>N=469</i> M=2.57 SD=.93
Gives a sense of personal accomplishment	<i>N=469</i> M=3.32 SD=.63	Too much hard work	<i>N=468</i> M=2.56 SD=.68
Increases Stamina	<i>N=469</i> M=3.27 SD=.55	Fatigued by exercise	<i>N=467</i> M=2.54 SD=.67
Improves the way my body looks	<i>N=469</i> M=3.23 SD=.62	Exercise places have no convenient schedules for me	<i>N= 467</i> M=2.46 SD=.82
N= number of responses, M= mean response (questions were rated on a Likert scale, 1= strongly disagree and 4= strongly agree), SD= Standard deviation.			

Table 9 illustrates the frequency of responses for the EBBS and shows the top five answers rated as benefits to exercise and the top five barriers stated by respondents. The EBBS was included in the questionnaire to determine what barriers and determinants participants stated to exercising and also whether an individual's score on this scale was associated with their level of physical activity. For example, if they rated the benefits of exercise as higher than the barriers (a higher overall score for the scale) were they more likely to be physically active? Table 9 also illustrates

that four of the top five benefits of exercising are related to physical functioning of the body or the body's physical form and only one is related to the psychological benefits of exercise. Three of the top five barriers to exercise are related to physical exertion when exercising and the other two are more practical problems with exercising.

The mean score for the EBBS for active participants was $M=66.19$ and $SD= 10.12$ and for inactive participants was $M=59.35$ and $SD=9.74$ the significance of this is discussed in table 13.

3.2.2 Secondary aims

Outcomes of Self efficacy for Exercise Scale (Resnick and Jenkins 2000)

Table 10- Outcomes from the self efficacy for exercise scale.

Scoring meant that participants with a higher score had a higher level of self efficacy related to physical activity. The rank in the table corresponds to the reported level of self efficacy for each situation the higher the rank the lower the level of self efficacy for that situation.

Rank	Answer	Level of Confidence
1	Had to exercise alone	N=469 M=6.53 SD=2.89
2	You felt too stressed	N=469 M=6.28 SD=2.66
3	The weather was bad	N=469 M=5.57 SD=2.74
4	You felt depressed	N=469 M=5.07 SD=2.97
5	You were bored by an activity	N=469 M=4.38 SD=2.49
6	You felt tired	N=469 M=4.19 SD=2.29
7	Too busy with other activities	N=469 M=3.77 SD=2.21
8	You felt pain when exercising	N=469 M=3.67 SD=2.45
9	You did not enjoy the activity	N=469 M=3.57 SD=2.34

This table illustrates that the highest level of self efficacy was in the case of having to exercise alone showing that this would not affect a person's ability to carry out physical activity. The lowest level of self efficacy was seen with not enjoying a particular activity showing that if an individual does not enjoy an activity they will not be very confident that they are able to carry it out.

The mean score for the self efficacy scale for active participants was M=51.09

SD=16.44 and for inactive participants was M=44.91 SD=16.07 the significance of this is discussed in table 13.

3.2.3 Outcomes of Social Support Scales (Sallis et al 1987)

Table 11 results of family social support scale

Rank	Top 3 answers for social support	Answer	Bottom 3 answers for no social support	Answer
1	Discussed physical activity with me	N=460 M=2.96 SD=1.43	Criticised for doing my activity	N=459 M=1.49 SD=.99
2	Encouragement to stick with activity	N=461 M=2.94 SD=1.72	Offered rewards for physical activity	N=458 M=1.58 SD=1.07
3	Offered to do activities with me	N=461 M=2.74 SD=1.33	Complained about amount of time spent doing physical activity	N=460 M=1.59 SD=1.08

Table 12 results of friends social support tables

Rank	Top 3 answers for social support	Answer	Bottom 3 answers for no social support	Answer
1	Offered to do activities with me	N=460 M=2.97 SD=1.38	Offered rewards for physical activity	N=458 M=1.36 SD=.90
2	Discussed physical activity with me	N=459 M=2.86 SD=1.43	Criticised for doing my activity	N=459 M=1.45 SD=.97
3	Did activities with me	N=460 M=2.83 SD=1.36	Complained about amount of time spent doing physical activity	N=459 M=1.52 SD=.99

Tables 11 and 12 illustrate the top three responses for the social support scales. A higher mean score for an item indicates a higher level of perceived social support for that item. Both the family and friends scales showed a high level of social support for offering to do physical activity with an individual and discussing physical activity with an individual. There was a greater social support with friends

carrying out physical activities together and more social support and encouragement to stick with activities from family.

Tables 11 and 12 also illustrate the items that seem to have low levels of social support associated with them. The family and friends scales showed the same items for low levels of social support in criticising physical activity, offering rewards for physical activity and complaining about the amount of time an individual's spends doing physical activity, however these were not ranked in the same order.

The mean score for the family scale for active participants was: $M=42.43$ $SD=17.77$ and inactive participants: $M=36.68$ $SD=18.27$ this is discussed further in table 13.

The mean score for the friends social support scale for active participants was $M=43.33$ $SD=18.47$ and for inactive participants was $M=35.31$ $SD=18.17$ this is also further discussed in table 13.

3.2.4. Outcomes of all scales compared to level of physical activity.

Table 13 Questionnaire outcomes and significance to physical activity level

Questionnaire measure	Active participants Score	Not active participants Score	P=	Confidence interval
Benefits and barriers scale	M=66.19 SD= 10.12	M=59.35 SD=9.74	.000* <0.001	95%
Self efficacy for exercise scale	M=51.09 SD=16.44	M=44.91 SD=16.07	.000* <0.001	95%
Family social support	M=42.43 SD=17.77	M=36.68 SD=18.27	.001* <.05	95%
Friend social support	M=43.33 SD=18.47	M=35.31 SD=18.17	.000* <0.001	95%
*Non equal variances significance level use due to non-significant result of Levene's test for equal variances.				

Table 13 illustrates that active participants have a significantly higher benefits and barriers score than non-active participants ($p < 0.001$). This means that physically active participants perceive less barriers and more benefits from exercise than non active respondents do.

Self efficacy scores are significantly higher for those who are active ($p < 0.001$) suggesting that those who are actually active report being more confident in their ability to be active.

The results from the t-test for the family social support scale and activity level were significant $p < 0.05$ as was the friend support scale and activity level ($p < 0.001$) level. This would suggest that those individuals who are active have a higher level of family and friendship social support than non active individuals. The results also

suggest that social support is more significantly linked to friendship than family within this study.

3.2.5 Gender differences in physical activity

Table 14 Gender differences in physical activity levels and scores on questionnaire main measures.

<u>Gender</u>	<u>Physically active</u>	<u>Not physically active</u>	<u>Benefits and barriers score</u>	<u>Self efficacy score</u>	<u>Family support for physical activity</u>	<u>Friend support for physical activity</u>
<u>Males</u>	45 (48.4%)	48 (51.6%)	M=64.23 SD=11.33	M=53.40 SD=18.53	M=40.10 SD=21.50	M=40.44 SD=21.35
<u>Females</u>	215 (57.3%)	160 (42.7%)	M= 62.8 SD=10.25	M= 47.1 SD= 15.80	M= 39.78 SD= 17.30	M=39.70 SD=18.03
	P=.12		P=.253	P=<0.05	P=.885	P=.765

The results showed that females perceive slightly more barriers to exercise but overall a higher percentage of females were physically active compared to males, 57.3% and 48.4% respectively although this was not statistically significant (p=.120). There was no significant difference between male and female scores on the benefits and barriers scale (p=.253), The family social support scale (p=.885) or the friends social support scale (p=.765) Refer to table 12 for full results reporting. There was a significant difference (p=<0.05) between male and female scores on the self efficacy for exercise measure with males having higher average scores than females (53.40 and 47.10 respectively).

In conclusion males reported a higher level of self efficacy than females but were not as physically active as females.

3.3 Summary

The results of this study showed that just under half of the sample population were inactive. The results also showed a significant link between an individual's score on all the main variables and an individual's level of physical activity (EBBS $p < .001$, Self efficacy for exercise scale $p < .001$, Friend social support scale $p < .001$ and Family social support scale $p < .05$). These results mean that if an individual scores higher on the EBBS, self efficacy for exercise scale or either social support scales then they are more likely to be physically active. The result also showed that females were more active than males although this was not significant ($p = .12$). However males reported statistically significantly higher scores on the self efficacy for exercise scale. The significance of these results will now be discussed.

Chapter Four: Discussion

4.1 Main outcome variable: Physical activity levels of undergraduate student nurses.

In response to the main research aim; it was found that just under half of the student nurses did not meet government recommendations for physical activity and were therefore classed as inactive for the purposes of this study.

The government are committed to increasing physical activity among NHS staff since the Boorman report published in 2009 which reported that NHS staff were not exhibiting positive health behaviours. The NHS responded by initiating schemes such as NHS Sport and Physical Activity (2010) that aims to get more staff active by 2012 through organised sport and competitive leagues. This and other schemes have been rolled out across the U.K but the results of this study would suggest that they are not fully effective for the student nurse population.

The results of this study are similar to published literature. Tucker et al (2010) found that 45% of their nurses were not meeting government physical activity recommendations. In addition, these findings support those of an earlier study by Staib (2006), which showed that nursing students do not exhibit positive health behaviours and are particularly poor in the area of physical activity.

These results are significant for the nursing profession because the literature suggests that society and increasingly nurses themselves are expecting nurses to act as role models for their patients (Shriver et al 2000, Clarke 1991, Rush et al 2005, Callaghan 1995). Furthermore, physical activity has many known positive health and disease specific benefits (DoH 2004a and McPherson et al 2002). If nurses are not physically active themselves, then they may be reluctant to advocate physical

activity to their patients (or, as research suggests, they may promote physical activity less successfully Rush et al 2005) or be seen as a less credible source of information (Spencer 2007).

4.2 General population physical activity levels

There is a consensus within the literature that nurses should have higher levels of physical activity than the general population in order for them to act as role models through physical activity health promotion (Callaghan 1995, Callaghan 1999, Rush et al 2005, Borchardt 2007).

A report by the Information Centre (2010a) about general population physical activity levels states that in 2008 only 39% of men and 29% of women reported meeting the government targets for physical activity lower than the levels reported in this study (48.4% male and 57.3% females).

This means that the nurses in this study have a higher level of physical activity than the general population. This may mean that they are good health promotion role models for their patients. When using the results of this study it is not possible to assess whether the respondents viewed themselves as a role model for their patient. The level of physical activity reported in this study is still low and for positive health benefits for the profession such as reduced sick days and improving quality of work, the physical activity level needs to increase.

4.3 General student population

The results of this study were compared to the literature on the physical activity levels of university students.

Level of physical activity was assessed using Marcus et al's (1992) stages of exercise change model. Clement et al (2004) used the same model to assess the physical activity levels of college students. They reported that 72% of individuals rated themselves as physically active. However their study only included five questions about physical activity and focused on other health benefits. Ebben and Brudzynski (2008) also found a higher level of physical activity in their study of college students. They found that 76.8% of the sample reported being regularly physically active. Some studies in the literature have found lower physical activity levels in university students than the current study. One such study was carried out by Lee and Yuen-Loke (2005) who reported that only 13.8% of their sample population rated themselves as being regularly physically active. However, the study was conducted in Hong Kong and so cultural differences may have produced different results to this study.

Overall it appears that student nurse levels of physical activity are lower than that of the general student population. This may be due to increased time constraints as lack of time was rated highly on the EBBS and the unusual structure of nursing courses compared to other university based courses. This may have an effect on the nursing profession as the participants in this study are the nursing profession of the future. If they are physically inactive now then this may continue when they are registered nurses making them a poor health promotion role model. Interventions

need to be individualised around the abnormal course structure of undergraduate nursing course for maximum effectiveness.

4.4 Main outcome variable two : Benefits and barriers to physical activity

4.4.1 Benefits

The other main outcome variable for this study was to examine any benefits and barriers reported by students for physical activity. The results of this study show the main benefits for exercise to be; increasing physical fitness, increasing cardiovascular function, giving a sense of personal accomplishment, increasing stamina and improving the way the body looks. These results are similar to the published literature. Deforche et al (2006) reported the main benefits of physical activity in healthy weight individuals as; feeling pleasure and improving health and physical condition. This study reported improving the way the body looked as a benefit of physical activity which is similar to improving physical condition.

There are also contrasting results within the published literature such as the study by Sirard et al (2006). Their study reported that the main benefits of physical activity were the social aspect of meeting people, an element of competition and increasing fitness and skill. In this study none of the social variables on the EBBS were rated as important for student nurses suggesting they contribute very little motivation to be physically active. There are limitations with the Sirard et al (2006) study such as the use of a five point Likert scale which meant that many responses were close to the null value and so the results may have been overestimated. A large scale study on the benefits of exercise reported by students was carried out by Robbins et al

(2009). They reported the key themes for the benefits of physical activity but did not suggest a logical order of effect for the benefits. The benefits reported included; staying in shape, staying healthy, opportunities for socialising, having fun, increasing energy levels, improving appearance and a coping strategy for stress. These results are similar to those from the current study as there was a large focus on the physical fitness benefits of activity. Again the Robbins et al (2009) study reported the social aspect of the physical activity as a benefit which was not found in the current study. This is furthered by Myers and Roth (1997) who found that the top benefit reported for physical activity was companionship and increased self confidence. Companionship was not found to be a significant benefit in the present study despite there being five items within the EBBS (Sechrist et al 1987) that related to social relationships (See appendix 2 items; 10, 21, 27, 34 and 36). The inclusion of the items relating to social relationships shows that there was opportunity for respondents to report any benefits or barriers relating to social relationships within the study. However, within the current study social support from peers and family did prove significant in an individual's physical activity level ($p < .001$ and $p < .05$ respectively). So social themes may not be viewed by students as a benefit or barrier to them being physically active but it will influence their decision to be physically active.

To conclude the benefits reported in this study for physical activity were in the general theme of improving body functioning and body aesthetics. Previously published literature suggest that students usually report social benefits of exercise but these were not found in this study. These results are significant as it can be seen that an individual's motivation to exercise is linked to improving their body

functioning showing that they may be effective at promoting physical health to patients.

4.4.2 Barriers

Barriers to physical activity were also studied as part of the main outcome variable. The barrier items that had the highest mean score within this study were; Exercise tires me, exercise costs too much money, exercise is too hard work, I am fatigued by exercise and exercise places have inconvenient schedules for me. These results show that the most common theme for barriers to being physically active are related to the physical exertion required to exercise and the resulting feeling of tiredness. The impact of tiredness as a barrier may be due to the physically demanding and stressful nature of an undergraduate nursing course (Kelly and Evans 2004, Jones and Johnston 1997). This is significant for the nursing profession because if an employer such as the NHS wants to increase the physical fitness of its staff then it may need to consider the shift pattern of its largest group of workers nurses such as structured system for staff breaks. If staff had structured break times then they would be able to attend exercise classes during the day when they may have more energy.

It is interesting that one of the top five barriers reported was linked to exercise places having no convenient scheduling for exercise. This may be linked to the hours that nursing students work. If an intervention was to be successful at increasing student nurses' physical activity levels it would have to include planning activities around an unpredictable schedule. These could include changing the

physical environment to encourage physical activity within the workplace, such as safer cycle routes to work or encouragement to use the stairs (Keating et al 2005).

To compare these results to the literature reveals that many studies have reported the feeling of tiredness as a barrier to exercise but always amongst other things. One such study was carried out by Fahlman et al (2006) who reported that the top barriers reported by high school students; disliked sweating too much, made them feel tired and not feeling safe in activity environment. These results may have been affected by the setting of the study but it shows that the exercise setting i.e. neighbourhood or leisure centre timetabling has an impact on physical activity levels. Fahlman et al's study was carried out on a multi-racial population whereas this study population was predominantly white (94%) which may account for difference in results. The barriers reported in the large scale study by Robbins et al (2009) are contrasting with the current study results as there is no mention of tiredness or lack of time among the top barriers. Instead barriers such as; self consciousness, disliking of sweating, insufficient opportunities and fear of getting hurt were reported. The Robbins et al (2009) study was focused mainly on younger students and so this may account for the difference in results.

4.5 Secondary aims

4.5.1 Self efficacy and physical activity

The current study found a significant relationship between levels of self efficacy and physical activity ($p < 0.001$). Von et al (2004) found that self efficacy had a significant and positive impact on physical activity. However they used self report questionnaire and reported a low response rate so results should not be

overestimated. Luszczynska et al (2004) carried out a survey in four countries and found that self efficacy was a significant predictor of physical activity in all four countries.

These results can be used within nursing health promotion practice. It is known that an individuals self efficacy increases their physical activity so interventions could focus on increasing self efficacy. This could occur through schemes that allow an individual to track their progress to provide positive reinforcement (Bandura 1977). Another way to increase an individuals' self efficacy may be through health promotion counselling from a health professional prior to an individual starting a physical activity regime. This would allow the individual and the healthcare professional time to discuss any reasons why an individual feels they cannot become physically active then they can be addressed.

4.2.2- Social support and physical activity

This study included a scale to measure social support for physical activity (Sallis et al 1987). The results for the social support scale (Sallis et al 1987) show that active respondents have a higher level of social support from both friends and family than non-active respondents (friends $p < .001$ and family $p < 0.05$). These results may suggest that among university students friend social support has more influence on physical activity than family. A study by Dwyer et al (2006) also found that social support from friends and family influenced an individuals' likelihood of being physically active. The results of their focus group discussions found that students reported that if they had to exercise alone then this would be a deterrent. This may have occurred because their sample was all female. This is different from the results

of this study where this was not considered a deterrent by respondents (see table 10). Ketteriedge et al (2008) also found that social support or exercising with family and friends increased physical activity levels. Many of the studies in the literature support the findings from this study that social support has an effect on physical activity. However, Von et al (2004) conducted a cross sectional sample survey to assess physical activity among university students and found that social support had little effect on levels of physical activity in both males and females. Surprisingly males reported higher social support scores than females on both the family and friends social support scales although this was not significant ($p=.885$ and $p=.765$ respectively).

These results are significant as they may suggest that to increase physical activity within the nursing profession may have to focus on peer or family centred approaches such as reduced family prices for activities such as swimming. The government have began to address this issue through the NHS Sport and Physical Activity initiative which aims to bring ward based teams together for organised sport to boost team morale.

4.6 Gender and physical activity

Gender differences for the determinants of physical activity were examined due to the large proportion of females in nursing (WHO 2008). A review of the literature shows that there are differences in the physical activity levels of males and females, this idea was not supported by the current research findings as no significant relationship was found between gender and physical activity level ($p=.12$). This may be due to the low sample size of males ($n=93$). The literature suggests that the

strongest gender differences in physical activity are related to the benefits and barriers reported by males and females to physical activity. Sirard et al (2006) found that males report competition as a benefit more than females and that females report an increase in skill level or a social element as a more important benefit to physical activity. Allinson et al (1999) found that males were more likely to report alcohol or drugs as a barrier and females more likely to report time constraints. There was very little gender differences reported for benefits and barriers within the current study. Females had on average a slightly lower EBBS score ($m=62.72$, $sd=10.31$) than males ($m=64.25$, $sd=11.33$) although this was not significant ($p=.120$) this may suggest that females perceive more barriers to exercise than males do however there was a small ($n=93$) amount of males in this study to allow for generalisations.

The results presented in Table 14 show that there is a significant difference in the scores for males and females on self efficacy scales ($p<0.05$). This is significant for practice because it may suggest that females do not have as much self belief in their ability to be physically active as males do and so may need more social support from colleagues or family to become physically active. If females have lower levels of self efficacy in their own physical activity they may not promote physical activity as effectively as males. The results for the comparison of genders for physical activity were that males have a higher self belief in their ability to be physically active but are not as physically active as females.

4.7 Study strengths and limitations

4.7.1-Strengths

The study had an acceptable response rate and therefore a large sample size (n=469) for generalisations to be made from the results. The study also used measures within the questionnaire that were validated and reliable as demonstrated by other studies and discussed previously in section 2.3.6.2 - 2.3.6.5. Further strengths to the study included a concise series of steps for dealing with the missing data. This has led to an individual's score being adjusted depending on their amount of missing responses and therefore provides a more reliable reflection of their views; this was demonstrated in section 2.3.7.

4.7.2- Limitations

Sample Recruitment

There were limitations with sample recruitment such as some cohorts of students not being available at the time of the study due to them being in clinical practice and so not in university teaching sessions. This could be improved by planning a longer data collection period to allow for all cohorts to be invited to participate this did not happen in the current study as the author had limited time for the study. Another limitation with sample recruitment was that any students absent on the days of data collection were not followed up and invited to participate. This would have been hard to achieve because the questionnaire was completed anonymously and so it would not have been ethical to identify those who had not been offered the chance

to take part. A repeat invitation is a possible solution to this problem but the chance of an individual completing duplicate questionnaires must be considered.

4.7.3- Questionnaire design

Certain items within the EBBS (Sechrist et al 1987) were highlighted as being unclear. There was a larger amount of missing data on one particular item within that measure; item number 22; my disposition is improved by exercise. This may be because disposition is not a widely used word in current language and so people may have not understood the question. Perhaps a revised version would include changing this word for a more suitable alternative such as character or nature. If the study was repeated an additional definition of being physically active would be included. The World Health Organisation 2010 definition includes those who don't exercise on most days of the week but do longer sessions a couple of times a week. This would be done because the assumption that those in the contemplation or pre-contemplation stage of the Stages of Exercise Change Model (Marcus et al 1992) are inactive may be inaccurate if they exercise for longer periods of time but only on three days of the week (Marshall and Biddle 2001).

4.7.4- Study design

The study used a paper and online survey that required a self report structure to report physical activity.. There is a well illustrated link between self report studies and the idea of social desirability. This is the idea that an individual may record a more positive answer that makes them look better in the eyes of the researcher.

They may also put an answer they think a researcher might like (Cormack 2000 and LoBiondo-Wood and Haber 1998). This could have been limited if another more reliable method was used such as researchers measuring B.M.I or there was a re-call system where students were asked one week later to fill out another questionnaire and any differences between the re-call and the original highlighted. This was not possible due to the skill and time available to the researcher.

4.8. Implications for practice

The results of this study suggest that just under half of the student nurse sample were not deemed physically active by the study definition. There is a need to increase the percentage of physically active student nurses because they are the next generation of the NHS nursing staff. Levels of physical activity need to increase because there are many well demonstrated benefits to the NHS when staff groups are physically active. These include; better personal physical health (DoH 2004a, Mcpherson et al 2002), improved mental health and therefore may have lower levels of workplace stress (Ryan 2008, Booth 2000, Taliferro et al 2008). Physically active staff groups are less likely to have periods of sickness absence from work saving the NHS money (Johnson et al 2003, Williams et al 1998). There are also many benefits of physically active staff on the patient's that use the NHS. Nurses are seen to act as role models for their patient's (Callaghan 1995, Ley 1988) and a physically active staff member maybe more enthusiastic to promote physical activity to their patient's.

An example of an intervention that may increase student nurse physical activity participation is the Q Active programme based at a local NHS trust (Lee et al 2008). The barriers reported by this study were surrounding no time for exercise and so an intervention based at the student's workplace would suit their needs. It's important to base a workplace wellness programme around individual needs as literature has shown that tailored interventions are more effective than large scale organisational interventions (Marshall 2004 and Conn et al 2009). Batt (2009) also suggests that a workplace intervention to increase physical activity levels could include providing opportunities for staff to have a healthy commute. For example if staff are able to cycle then they need to be provided with changing facilities and the opportunity to access food afterwards. If a healthy commute is viewed as a pleasurable experience with more benefits than barriers then more staff will be likely to take up the option.

Another strategy for increasing NHS physical activity levels could be workplace health education programmes. These would also be useful as nurses have a large health promotion role with their patient's including counselling them on the benefits of physical activity. A health education programme may increase staff physical activity participation but may also increase their knowledge surrounding the benefits and negative impacts of not being physically active. If staffs are more knowledgeable then they will be more informed when they counsel patient's which will benefit patients. Much of the literature surrounding workplace health education programmes is outdated (Lovato and Green 1990 and Sloan and Gruman 1998). However, the research does suggest that there are many associated problems with recruiting staff for the programme and organisational barriers to continued participation (Lovato and Green 1990 and Sloan and Gruman 1998).

An example of an effective and well evaluated intervention programme within the NHS is run by NHS Sport and Physical Activity as previously discussed. The benefits have been reported by staff as increasing their personal physical fitness, motivation at work and improving interprofessional relationships (NHS Sport and Physical Activity 2010).

These barriers to workplace wellness and health education programmes can be related to the working patterns of student and qualified nurses. Nurses sometimes have very short break times and therefore would not have time to attend any classes on offer. Nurses also work shift work and long shifts and so may not have the energy to carry out an intervention activity after work. All these factors need to be considered when developing an intervention. A local initiative is being carried out at the trust where focus groups are being conducted with staff to try to tackle these barriers.

4.8.1 Implications for my personal future practice

I have appreciated the opportunity to understand the research process and the many practical problems associated with this. Through the reading undertaken for this project I have decided to increase my own physical activity levels and feel better and more able to cope with the physical stress of nursing. I know understand the growing health promotion role of nurses and how one's own personal health may affect the level of health promotion they give. Through informal feedback from those taking part in the study many people were reporting that this study was prompting them to review their physical activity level. It is hoped that this project has raised awareness of the importance of being physically active and how this

might have implications for practice. Taking on a large scale dissertation such as this has really challenged me and allowed me to see what I am capable of. I am particularly proud of how much time and effort went into correcting the problem with missing data as there were times when I thought I would never get there.

4.9. Further research

To build on this study further research needs to be conducted to develop and then evaluate interventions aimed at increasing student nurse and qualified nurses physical activity levels. If a workplace wellness scheme is initiated then its financial impact and other outcomes need to be evaluated for their effectiveness. This study could be expanded using a qualitative approach to examine in depth benefits and barriers reported by qualified or student nurses. This would allow them to expand and offer ideas about an effective intervention to increase physical activity levels. There could also be further research into whether an increase in the inclusion of the importance of physical activity into education to raise student nurse awareness would be effective.

There is also the possibility of establishing health champions or role models within smaller areas of the NHS such as at ward level who could disseminate any new knowledge to staff and advertise and advocate any workplace interventions.

4.10. Conclusion

Research had suggested that nurses are expected to act as health promotion role models for their patients. Current levels of nurse's physical activity levels are low and need to be increased to provide positive health benefits to the NHS workforce which is being reflected in recent policy.

After gaining ethical approval standardised measures were used within a paper and online questionnaire to assess student nurse levels for physical activity and any benefits and barriers to physical activity.

The results of the study showed that just under half of the studied student nurse population were inactive (44.34%). It was also shown that an individual's score on the EBBS for physical activity and the self efficacy for exercise scale as well as both friend and family social support scales significantly influenced their physical activity level.

From the results it can be suggested that social support from friends and family and levels of self efficacy are determinants of physical activity participation. This is significant for nursing health promotion as they need to be included in any intervention to increase a groups physical activity level.

References

- Ades, P., Pashkow, F.J., Nestor, J.R.(1997) **Cost-effectiveness of cardiac rehabilitation after myocardial infarction.** *Journal of Cardiopulmonary Rehabilitation*; 17:222–31.
- Aldana, S.G., Merrill, R.M., Price, K. Hardy, A. Hager, R. (2005) **Financial impact of a comprehensive multi-site workplace health promotion program,** *Preventive Medicine*, 40, 131-137
- Allinson, K.R., Dwyer, J.J.M., Makin, S. (1999) **Perceived Barriers to Physical Activity among high school students,** *Preventive Medicine*, 28, 608-615
- Apullan, F.J., Bourassa, M.G., Tardif, J.C., Fortier, A., Gayda, M. Nigam, A. (2008) **Usefulness of Self-Reported Leisure-Time Physical Activity to Predict Long-Term Survival in Patients With Coronary Heart Disease.** *The American Journal of Cardiology*, 102: 375-379
- Baicker, K. Cutler, D. Song, Z. (2010) **Workplace wellness programmes can generate savings,** *Health Affairs*, available at www.content.healthaffairs.org
- Bandura, A. (1977) **Social Learning Theory**, New Jersey, Prentice-Hall
- Bandura, A. (1982) **Self efficacy in human agency,** *American Psychologist*, 37 [2] 122-147

Bandura, A. (2004) **Health Promotion by social cognitive means**, *Health Education Behaviour*, 31 (2) 143-164

Batt, M.E., (2009) **Physical activity interventions in the workplace: the rationale and future direction for workplace wellness**, *British Journal of Sports Medicine*, 43, 47-48

Boorman, S. (2009) for the Department of Health **NHS Health and Well-being review: Final Report**, The Stationary Office, London

Booth, K. Faulkner, A. (1986) **Links between nurses and cigarette smoking**, *Nurse Education Today*, 6, 176-182

Booth, M.L., Owen, N., Bauman, A., Clavisi, O., Leslie, E. (2000) **Social cognitive and perceived environment influences associated with physical activity in older Australians**, *Preventative Medicine*, 31, 15-22

Borchardt, G.L., (2007) **Role models for health promotion: The challenge for nurses**, *Nursing Forum*, 35 [3] 29-32

Boyd, M.A., (1988) **Level of wellness of nursing students**, *Health Values*, 12 [55] 14-20

British Heart Foundation (2007) **Coronary Heart Disease Statistics**, available at, <http://www.heartstats.org/datapage.asp?id=6799>

Brown, S.A. (2005) **Measuring Perceived Benefits and Perceived Barriers for Physical Activity**, *American Journal of Health Behaviour*, 29 [2] 107-116

Brox, J.I., Frøyskin, O. (2005) **Health related quality of life and sickness absence in community nursing home employees**, *Occupational Medicine*, 53, 558-563

Callaghan, P. (1995) **A preliminary survey of nurses' health related behaviours**, *International Journal of Nursing Studies*, 32 [1] 1-15

Callaghan, P. (1999) **Health beliefs and their influence on United Kingdom nurses health related behaviours**, *Journal of Advanced Nursing*, 29 [1] 28-35

Canadian Institute for Health Information (2007) The work and health of nurses: How do nurses perceptions vary across Canada? In Tucker SJ, Harris MR, Pipe TB, Stevens SR (2010) **Nurses ratings of their health and professional work environments**, *American Association of Occupational Health Nurses*, 58, [6] 253-269

Caspersen, C.J., Powell, K.E., Christenson, G.M. (1983) **Physical Activity, Exercise and Physical Fitness: Definitions and distinctions for health related research**, *Public Health Reports*, 100 (2), 127

Caputi, P., Balnaves, M. (2001) **Introduction to Quantitative Research methods: An Investigative Approach**, SAGE, London

Clarke, A.C., (1991) **Nurses as role models and health educators**, *Journal of Advanced Nursing*, 16 [10] 1178-1184

Clement, M., Nurs, M., Jankowski, L.W., Bouchard, L., Perrault, M., Lepage. Y. (2002) **Health behaviours of nursing students: a longitudinal study**, *Journal of Nursing Education*, 39 (7) 308-314

Clement, J.M., Schmidt, C.A., Bernaix, L.W., Cavington, N.K., Carr, T.R. (2004) **Obesity and physical activity in college women: Implications for clinical practice**, *Journal of the American Academy of Nurse Practitioners*, 16, [17] 291-301

Conn, V.S., Hafdahl, A.R., Cooper, P.S., Brown, L.M., Lusk, S.L., (2009) **Meta-analysis of workplace physical activity interventions**, *American Journal of Preventive Medicine*, 37 [4] 330-339

Cormack, D. (2000) **The Research Process in Nursing**, Blackwell Science, Oxford.

Cresswell, J.W. (2009) **Research Design: Qualitative, Quantitative and mixed methods approach 3rd edition**, SAGE, London

Deforche, B.I, De Bourdeaudhuij, I.M., Tonghe, A.P., (2006) **Attitude toward physical activity in normal-weight, overweight and obese adolescents**, *Journal of Adolescent Health*, 38, 560-568

Dennis, C.L. (2003) **Peer support within a health care context; a concept analysis**, *International Journal of Nursing Studies*, 40, 321-332

Department of Health (2004a) **At least 5 a week- evidence on the impact of physical activity and its relationship to health- a report by the Chief Medical Officer**, available at http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4080994

Department of Health (2004b) **Choosing Health: making healthy choices easier**, available at www.dh.gov.uk

Department of Health (2005) **Choosing Activity: a physical activity action plan**, available at www.dh.gov.uk/publications

Department of Health (2009) **Be active, be Healthy: A plan for getting the nation moving**, The Stationary Office, London

Department of Health (2010) **Healthy Lives, Healthy People: our strategy for public health in England**, Available at

http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_122347.pdf

Dinger, M.K. Waigandt, A. (1997) **Dietary intake and physical activity behaviours of male and female collage students**, *American Journal of Health Promotion*, 11 [5], 360-363

Dishman, R.K., Sallis, J.F., Orenstein, D.R. (1985) **The determinants of physical activity and exercise**, *Public Health Research*, 100, 158-171

Dittmar, S.S., Haughey, B., O'Shea, R.M., Brasure, J. (1989) **Health practices of nursing students: a survey**, *Health Values*, 13,[2] 24-31

Drummond, H.E., Ghosh, S., Ferguson, A., Brackenbridge, D., Tiplady, B. (1995) **Electronic Quality of Life Questionnaires; a comparison of pen based electronic questionnaires with conventional paper in a gastrointestinal study**, *Quality of Life Research*, 4, 21-26

Dubbert, M.J. (1982) **Exercise applications and promotion in behavioural medicine: current status and future directions**, *Journal of Consultant Clinical Psychology*, 50, 465-466

Dwyer, J.J.M., Allinson, K.R., Goldenberg, E.R., Fein, A.J., Yoshida, K.K., Boutilier, M.A. (2006) **Adolescent girls perceived barriers to participation in physical activity**, *Adolescent*, 41 (161)

Ebben, W., Brudzynski, L., (2008) **Motivations and barriers to exercise among college students**, *Journal of Exercise Physiology*, 11 [5] 1-10

Fahlmen, M.M., Hall, H.L., Lock, R., (2006) **Ethnic and socioeconomic comparisons of fitness, activity levels and barriers to exercise in high school females**, *Journal of School Health*, 76 [1] 12-17

Ferrie, J.E., Head, J., Shipley, M.J., Vahtera, J., Marmot, M.G., Kivimaki, M. (2007) **BMI, Obesity and Sickness Absence in the Whitehall II Study**, *Obesity*, 15, 1554-1564

Field, A. (2005) **Discovering Statistics Using SPSS**. 2nd Edition. London: Sage Publications

Fox, S., Rainie, L., Larsen, E., Horrigan, J., Lenhart, A., Spooner, T., Carter, C. (2001). **Wired Seniors. The Pew Internet and American Life Project**. Available at : http://www.pewinternet.org/pdfs/PIP_Wired_Seniors_Report.pdf

Frank, E., Rothenberg, R., Lewis, C., Belodoff, B.F. (2000) **Correlates of physician's prevention- related practices**, *Archives in Family Medicine*, 31, 308-313

Frank, E., Galuska, D.A., Elon, L.K., Wright, E.H. (2004) **Personal and clinical exercise related attitudes and behaviours of freshmen US medical students**, *Research Questions in Exercise and Sport*, 75 (2) 112-121

Frank, E., Tong, E., Lobelo, F., Carrera, J., Duperly, J. (2008) **Physical Activity and counselling practices of US medical students**, *Medicine Science Sports and Exercise*, 40 (3) 413-421

Frenn, M., Malin, S., Villamuel, A.M., Slaikeu, K., McCarthy, S., Freeman, J., Nee, E. (2005) **Determinants of physical activity and low fat diet among low income African American and Hispanic middle school students**, *Public Health Nursing*, 22 [2] 89-97

Friis, K., Ekholm, O., Hundrop, Y.A. (2005) **Comparison of lifestyle and health among Danish nurses and the Danish female population: is it possible to generalise findings from nurses to the general female population?** *Scandinavian Journal of Caring Science*, 19, 361-367

Goltlieb, N.H., Baker, J.A. (1986) **The relative influence of health beliefs, parental and peer behaviours and exercise programme participation on smoking, alcohol use and physical activity**, *Social Science and Medicine*, 9, 915-927

Government National Sustainable Development Indicators (2006) Available at:

<http://www.sustainable-development.gov.uk/progress/national>

Government Office for Science (2007) **Foresight: Tackling Obesity- Future Choices**, available at;

http://www.foresight.gov.uk/Obesity/Obesity_final/Index.html

Gravetter, F.J., Wallnau, L.B. (2008) **Essentials of Statistics for the Behavioral Sciences**, Thomas Higher Education, Belmont CA

Grieser, M., Vu, M.B., Bedimo-Rung, A.L., Neumark- Sztainer, D., Moody, J., & Young, D.R. (2006). **Physical activity, attitudes, preferences, and practices in African American, Hispanic, and Caucasian girls.** *Health Education & Behaviour*, 33(1), 40–51.

Grubbs, L., Carter, J. (2002) **The relationship of perceived benefits and barriers to reported exercise behaviours in college undergraduates.** *Family and Community Health*. 25:76-84.

Gruber, K. (2008) **Social support for exercise and dietary habits among college students,** *Adolescence*, 43 [171] 557-577

Haddad, L., Kane, D., Rajacich, D., Cameron, S., Al-Ma'aitah, R. (2004) **A comparison of health practices of Canadian and Jordanian Nursing students,** *Public Health Nursing*, 21 (1) 85-90

Horrigan, J.B. (2001). **Online communities: Networks that nurture long-distance relationships and local ties.** Pew Internet and American Life Project. Available at : <http://www.pewInternet.org/reports/toc.asp?Report=47>

Houmard, J.A., Tanner ,C.J., Slentz, C.A., Duscha ,B.D., McCartney, J.S., Kraus, W.E., (2004) **Effect of the volume and intensity of exercise training on insulin sensitivity.** *Journal of Applied Physiology*, 96 (1), 101–106.

Humpel, N., Owen, N., Leslie, E. (2002) **Environmental factors associated with adults participation in physical activity: A review,** *American Journal of Preventative Medicine*, 22 [3] 188-199

Janz, N.K., Becker, M.H. (1984) **The Health Belief Model; a decade later,** *Health Education Quarterly*, 11, 1-47

Jang, H.J., Shin, Y.H. (1999). **The cultural verification and psychometric evaluation of the exercise benefits/barriers scale for Korean adults with chronic disease.** *Paper Presented at the Meeting of the First Asian–Pacific Nursing Congress Conference, Seoul, Korea.*

Johnson, C.J., Croghan, E., Crawford, J. (2003) **The problem and management of sickness absence in the NHS: considerations for nurse managers,** *Journal of Nursing Management*, 11, 336-342

Jones, M.C., Johnston, D.W., (1997) **Distress, stress and coping in first year student nurses**, *Journal of Advanced Nursing*, 26, 475-482

Keating, X.D., Guan, J., Pintero, J.C., Bridges, D.M. (2005) **A meta-analysis of college students physical activity behaviours**, *Journal of American college health*, 54 (2) 116-129

Kelly, B., Evans, W., (2004) **Pre-registration diploma student nurse stress and coping measures**, *Nurse Education Today*, 24, 473-482

Ketteridge, A., Boshoff, K., (2008) **Exploring the reasons why adolescents participate in physical activity and identifying strategies that facilitate their involvement in such activity**, *Australian Occupational Therapy Journal*, 55, 273-282.

Knowler, W.C., Barrett-Connor, E., Fowler, S.E., Hamman, R.F., Lachin, J.M., Walker, E.A., Nathan, D.M. (2002) **Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin**. *The New England Journal of Medicine*, 345 (6): 393-403

Kwen, M.Y.W., Russel-Bray, S., Martin Ginis, K.A. (2009) **predicting physical activity of first year university students: an application of the theory of planned behaviour**, *Journal of American College Health*, 58 (1) 45-57

Lawrence, D., Schonk, M.J. (1993) **Health status, health perceptions and health behaviours of young adult women**, *International Journal of Nursing Studies*, 30 (6) 527-535

Lee, R.L.T., Yuen-Loke, A.J.T. (2005) **Health promoting behaviours and psychosocial well-being of university students in Hong Kong**, *Public Health Nursing*, 22 (3) 209-220

Lee, S., Batt, M., Mortimer, D., Blake, H., Booth, Y., (2008) **Q Active: Feel better, work better, Final Report, Executive Summary**, Available at http://www.qactive.co.uk/pdfs/exec_summary.pdf

Leslie, J., Yancey, A., McCarthy, W., Albert, S., Wert, C., Miles, O. (1999). **Development and implementation of a school-based nutrition and fitness promotion program for ethnically diverse middle-school girls**. *Journal of the American Dietetic Association*, 99, 967–970.

Ley, P. (1998) **Communicating with patients: Improving communication, satisfaction and Compliance**, Chapman and Hall, London

LoBiondo-Wood, G., Haber, J., (1998) **Nursing Research: Methods, appraisal and utilization**, Mosby, St Louis

Lovato, C.Y., Green, L.W., (1990) **Maintaining employee participation in workplace health promotion programmes**, *Health Education and Behaviour*, 17 [1] 73-88

Luszczynska, A., Gibbons, F.X., Piko, B.F., Tekozel, M., (2004) **Self regulatory cognitions, social comparison and perceived peers behaviours as predictors of nutrition and physical activity: a comparison among adolescents in Hungary, Poland, Turkey and U.S.A**, *Psychology and Health*, 19 [5] 577-593

Marcus, B.H., Rokowski, W., Rossi, J.S. (1992) **Assessing motivational readiness and decision making for exercise**, *Health Psychology*, 11 (4) 257-261

Marcus, B.H. Simkin, L.R. (1994) **The Transtheoretical model: applications to exercise behaviour**, *Medicine and Science in Sports and Exercise*, 26 (11) 1400-1405

Marshall, S.J., Biddle, S.J.H. (2001) **The Transtheoretical model of behavioural change: a Meta analysis of applications to physical activity and exercise**, *Annals of behavioural medicine*, 23 (4) 229-249

Marshall, A.L (2004) **Challenges and opportunities for promoting physical activity in the workplace**, *Journal of Science and Medicine in Sport*, 7 [1] supplement 60-66

Maxim, P. (1999) **Quantitative research methods in the social sciences**, Oxford University Press, Oxford

McDowell, N., McKenna, J., Naylor, P., (1997) **Factors that influence practice nurses to promote physical activity**, *British Journal of Sports Medicine*, 31, 308-313

McKenna, J., Naylor, P.J., McDowell, N., (1998) **Barriers to physical activity promotion by General Practitioners and Practice Nurses**, *British Journal of Sports Medicine*, 32, 242-247

McPherson, K., Britton, A., Caser, L. (2002) **Coronary heart disease estimating the impact of changes in risk factors**, The Stationary Office, London

Miller, B.W., Cress, C.L., Johnson, M.E., Nichols, D.H., Schnitzler, M.A. (2002) **Exercise during haemodialysis decreases the use of antihypertensive medications**. *American Journal of Kidney Disease* 39 (4), 828–833.

Misra, R., (2000) **Academic stress of collage students: comparison of student and faculty perceptions**, *Collage Student Journal*, 21, 1-10

Myers, R.S., Roth, D.L. (1997) **Perceived benefits and barriers to exercise and stage of exercise adoption in young adults**, *Health Psychology*, 16 (3) 277-283

National Centre for Social Research (2004) **Health Survey for England 2003**,

available at:

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsStatistics/DH_4098712

Neovius, K., Johansson, K., Kark, M., Neovius, M. (2009) **Obesity status and sick leave: a systematic review**, *Obesity Reviews*, 10, 17-27

Neupert, S.D., Lachman, M.E., Whitbourne, S.B. (2009) **Exercise Self-Efficacy and Control Beliefs: Effects on Exercise Behaviour After an Exercise Intervention for Older Adults**, *Journal of Ageing and Physical activity*, 17 [1]

NHS Sport and Physical Activity (2010) **NHS Sport and Physical Activity: Meeting the NHS challenge to get more staff active by 2010**, available at www.nhssportandphysicalactivity.com [accessed 01/02/11]

Nigg, C.R., Lee, H.R., Hubbard, A.E., Min-Sun, K. (2009) **Gateway health behaviours in college: Investigating transfer compensation effects**, *Journal of American College Health*, 58, (1) 39-45

Nie, N., Erbing, L. (2000) **Internet and Society: A Preliminary Report**. In Wright KB (2005) researching Internet Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages and Web Survey Services, *Journal of Computer Mediated Communication*, 10, 3,

available at

<http://jcmc.indiana.edu/vol10/issue3/wright.html?ref=BenimShopum.com>

Nie, N., Hillygus, S., Erbring, L. (2002). **Internet use, interpersonal relations and sociability: Findings from a detailed time diary study.** In B. Wellman (Ed.), *The Internet in Everyday Life* (pp. 215-243). London: Blackwell Publishers.

Nosek, B.A., Banaji, M.R., Greenwald, A.G. (2002) **E-Research: Ethics, Security, Design and control in psychological research on the internet,** *Journal of Social Issues*, 58, (1) 161-176

Nutbeam, D., Harris, E., (1998) **Theory in a Nutshell: A Practitioner's Guide to Commonly Used Theories and Models in Health Promotion.** Sydney, Australia: National Centre for Health Promotion

Painter, P., Carlson, L., Carey, S., Paul, S.M., Myll, J., (2000) **Low-functioning haemodialysis patients improve with exercise training.** *American Journal of Kidney Disease*, 36 (3), 600–608.

Parks, K.M., Steelman, L.A. (2008) **Organizational workplace wellness programs: a meta analysis,** *Journal of Occupational Health Psychology*, 13, [1], 58-68

Persson, M., Martensson, J. (2006) **Situations influencing habits in diet and exercise among nurses working night shift**, *Journal of Nursing Management*, 14, 414-423

Plotnikoff, R.C., Hotz, S.B., Birkett, N.J., Courneya, K.S. (2001) **Exercise and the Transtheoretical Model: A Longitudinal Test of a Population Sample**, *Preventive Medicine*, 33, 441-452

Pratt, J.P., Overfield, T., Hilton, H.G. (1994) **Health behaviours of nurses and general population women**, *Health Values*, 18 (5) 41-46

Prochaska, J.O., Marcus, B.H. (1994) **The transtheoretical model: applications to exercise**. In: Dishman R.K., editor. *Advances In Exercise Adherence*. Champaign (IL): Human Kinetics, 161-80

Prochaska, J.O., Velicer, W.F. (1997) **The Transtheoretical model of behaviour change**, *American Journal of Health Promotion*, 12 [1] 38-48

Prochaska, J.J., Rodgers, M.V., Sallis, J.F. (2002) **Association of parent and peer support with adolescent physical activity**, *Research Quarterly for Exercise and Sport*, 73 [2] 206-210

Pronk, N.P., Martinson, B., Kessler, R.C., Beck, A.L., Simon, G.C., Wang, P. (2004) **The association between work performance and physical activity**,

cardiorespiratory fitness and obesity, *Journal of Occupational and Environmental Medicine*, 46, 19-25

Resnick, B., Jenkins, L.S. (2000) **Testing the reliability and validity of the self efficacy for exercise scale**, *Nursing Research*, 49 (3) 154

Rhodes, R.E., Martin, A.D., Taunton, J.E., Rhodes, E.C., Donnelly, M. Elliot, J. (1999) **Factors associated with exercise adherence among older adults; an individual perspective**, *Sports Medicine*, 28 [6] 397-411

Richter, J.M., Malkiewicz, J.A., Shaw, D. (1987) **health promotion behaviours in nursing students**, *Journal of Nursing education*, 26 (9) 367-371

Robbins, L.B., Pender, N.J., Kazanis, A.S. (2003) **Barriers to Physical Activity perceived by adolescent girls**, *American Collage of Nurse-Midwives*, 48 [3] 206-213

Robbins, L. (2004) **Physical activity practice patterns in nurse practioners**, *Clinical excellence for Nurse Practioners*, 8 (4) 189-194

Robbins, L.B., Sikorskii, A., Hamel, L.M., Wu, T.Y., Wilbur, J. (2009) **Gender comparisons of perceived benefits and barriers to physical activity in middle school youth**, *Research in Nursing and Health*, 32, 163-176

Rosenstock, I.M., Steecher, V.J., Becker, M.H. (1988) **Social Learning Theory and The Health Belief Model**, *Health Education Quarterly*, 15, 175-183

Rush, K.L., Kee, C.C., Rice, M. (2005) **Nurses as imperfect role models for health promotion**, *Western Journal of Nursing Research*, 27, 166

Ryan, M.P. (2008) **the antidepressant effects of physical activity: Mediating self esteem and self efficacy mechanisms**, *Psychology and Health*, 23 (3) 279-307

Salkind, N.J. (2007) **Statistics for People who (think they) hate Statistics: The Excel Edition**. London: Sage Publications

Sallis, J.F., Grossman, R.M., Pinski, R.B., Patterson, T.L., Nader, P.R. (1987). **The development of scales to measure social support for diet and exercise behaviours**. *Preventive Medicine*, 16, 825-836.

Sechrist, K.R., Walker, S.N., Pender, N.J. (1987) **The health promoting lifestyle profile: development and psychometric characteristics**, *Research in Nursing and Health*, 36 (2) 76-81

Shriver, C.B., Scott-Stiles, A. (2000) **Health habits of nursing versus non nursing students: a longitudinal study**, *Journal of Nurse Education*, 39 (7) 308-314

Sidman, C.L., D'Abundo, M.L., Hritz, N. (2009) **Exercise self efficacy and perceived wellness among college students on a basic studies course**, *International Electronic Journal of Health Education*, 12, 162-174

Silverman D (2010) **Doing Qualitative Research**, SAGE, London

Sirard, J.R., Pfeiffer, K.A., Pate, R.R. (2006) **Motivational factors associated with sports program participation in middle school students**, *Journal of Adolescent Health*, 38, 696-703

Sloan, R.P., Gruman, J.C., (1988) **Participation in workplace health promotion programs: The contribution of health and organisational factors**, *Health Education and Behaviour*, 15 [3] 269-288

Soeken, K.L., Bousell, R.B., Winkleskin, M., Carson, V.J. (1989) **Preventative behaviour: attitudes and compliance in nursing students**, *Journal of Advanced Nursing*, 14, 1026-1033.

Spencer, C., (2007) **Should nurses model healthy behavior? If nurses are to be credible health promoters, they must have good communication skills and demonstrate they are at least trying to lead healthy lifestyles themselves**, *Health Publications*, available at

http://findarticles.com/p/articles/mi_hb4839/is_7_13/ai_n29372336/?tag=content;co

11

Staib, S., Fusner, S., Consolo, K. (2006) **how healthy are your nursing students?**
Teaching and Learning in Nursing, 1, 55-60

Stark, M.A., Manning-Walsh, J., Vliem, S. (2005) **Caring for self while learning to care for others: a challenge for nursing students**, *Journal of Nursing Education*, 44 (6) 266-271

StatPac Inc (2010) **Advantages and Disadvantages of Written Questionnaires**, available at <http://www.statpac.com/surveys/disadvantages.htm>

Stewart, M.J., Tilden, V. (1995). **The contributions of health care science to social support**, *International Journal of Nursing Studies*, 32, 535–544.

Suminski, R.R., Petosa, R., Ulter, A.C., Zhang, J.J. (2002) **Physical activity among ethnically diverse collage students**, *Journal of American Collage Health*, 51 [2] 75-81

Sun, Y.B., Chen, B.L., Jia, Q., Wang, J.M. (2003) **Exercise therapy during haemodialysis to improve adequacy of dialysis randomized controlled trial**. *Chinese Journal of Clinical. Rehabilitation*. 7 (27), 3702–3703.

Taber, D.R., Meischke, H., Maciejewski, M.L., (2010) **Testing Social Cognitive Mechanisms of Exercise in College Students**, *American Journal of Health Behaviour*, 34 [2] 156-165

Taylor, W.C., Yancey, A.K., Leslie, J., Murray, N.G., Cummings, S.S., Sharkey, S.A., (1999). **Physical activity among African American and Latino middle school girls: Consistent beliefs, expectations, and experiences across two sites.** *Women & Health*, 30(2), 67–82.

Taylor, R.S., Brown, A., Ebrahim, S., Jolliffe, J., Noorani, H., Rees, K., Skidmore, B., Stone, J.A., Thompson, D.R., Oldridge, N., (2004) **Exercise based rehabilitation for patients with coronary heart disease: systematic review and meta analysis of randomized controlled trials.** *American Journal of Medicine* ;116:682–92.

Taliaferro, L.A., Rienza, B.A., Pigg, M., Miller, D., Dodd, V.J., (2008) **Associations between physical activity and reduced rates of hopelessness, depression and suicidal behaviour among college students,** *Journal of American Collage Health*, 57 [4] 427-437

The Information Centre (2009) **Sickness absence rates in the NHS: April – June 2009, experimental statistics,** available at www.dh.gov.uk

The Information Centre (2010a) **Statistics on obesity, physical activity and diet, England 2010** available at www.dh.gov.uk

The Information Centre (2010b) **Sickness Absence Rates in the NHS: April:June 2010,** available at:

http://www.ic.nhs.uk/webfiles/publications/010_Workforce/absenceratesjune10/SA_Bulletin_Oct10.pdf

Thombs, D.L. (2000) **A test of the perceived norms model to explain drinking patterns among university student athletes**, *Journal of American College Health*, 49, 75-84

Tones, K., Tilford, S., (2001) **Health Promotion: effectiveness, efficiency and equity**, Nelson Thomas, Cheltenham.

Tucker, S.J., Harris, M.R., Pipe, T.B., Stevens, S.R. (2010) **Nurses ratings of their health and professional work environments**, *American Association of Occupational Health Nurses*, 58, [6] 253-269

Treiber, F.A., Baronowski, T., Braden, D.S., Strong, W.B., Lewy, M., Knox, W. (1991) **Social support for exercise; relationship to physical activity in young adults**, *Preventive Medicine*, 20 [60] 737-750

Undertaking Nursing Interventions Throughout Europe Study Group (2002) **A survey of coronary risk factors in a cohort of cardiac nurses from Europe: do nurses practice what they preach?** *European Journal of Cardiovascular Nursing*, 1, 57-60

Wen, M., Thomas, M., Orr, H., Moreton, R., King, L., Hawe, P., (2002) **Promoting physical activity in women: evaluation of a 2 year community based intervention in Sydney, Australia**, *Health Promotion Intervention*, 17 [2] 127-137

Williams, S., Michie, S., Pattani, S. (1998) **Improving the health of the NHS workforce**, *Report of the partnership on the health of the NHS workforce*, Nuffield Trust, London

Wise, M.F. (2010) Coronary **Heart Disease: The benefits of Exercise**, *Australian Family Physician* 39, [3] 129-134

World Health organisation (1995) **Physical Status: The Use and Interpretation of Anthropometry**, available at http://whqlibdoc.who.int/trs/WHO_TRS_854.pdf

World Health Organization, (1998) **Health Promotion: Milestones on the Road to a Global Alliance**. *World Health Organisation*, Geneva.

World Health Organisation (2002) *The World Health Report 2002- Reducing Risks, promoting Healthy Lifestyle*, available at: <http://www.who.int/whr/2002/en/>

World Health Organisation (2008) *Spotlight on Statistics- A fact file on health workforce statistics*, 2, available at www.who.int

World Health Organisation (2010) **Global recommendations on physical activity for health**, available at:

http://whqlibdoc.who.int/publications/2010/9789241599979_eng.pdf

Wright, K.B. (2005) **Researching Internet Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages and Web Survey Services**, *Journal of Computer Mediated Communication*, 10, 3, available at

<http://jcmc.indiana.edu/vol10/issue3/wright.html?ref=BenimShopum.com>

Young-Shin, L., Cloutier-Laffrey, S. (2008) **Exercise and Self-Efficacy Among Employed Hispanic Men and Women**, *Hispanic Health Care International*, 6,[1],

Zapka, J.M., Lemon, S.C., Magner, R.P., Hale, J. (2009) Lifestyle behaviours and weight among hospital based nurses, *Journal of Nursing Management*, 17, 853-860

Zheng, A., Li-Ming You, A., Tan-Qi, B., Nian-Chang Chen, B., De-Yuan Lai, C., Yan-Yi Liang, C., Ying-Na Li, D., Ying-Ming, E., Shao-Fen, E., Cui-Qiu, Z. (2010) **Development and psychometric evaluation of the Dialysis patient-perceived Exercise Benefits and Barriers Scale**, *International Journal of Nursing Studies* (47) 166–180