

# **Effectiveness of a holistic health program for women**

Michelle Jorna, B App Sc (Human Movement)  
Centre for Physical Activity & Nutrition Research  
School of Exercise and Nutrition Sciences

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## STUDENT'S CERTIFICATION

I am the author of the thesis entitled

**'Effectiveness of a holistic health program for women'**

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And I agree to grant the School of Exercise and Nutrition Sciences permission to make this thesis available for consultation, loan, or photocopying in whole or in part.

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\_\_\_\_\_

Date: December 17, 2004

Name: Michelle Jorna

ID Number: 98318541

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## **ABSTRACT**

Physical inactivity is the leading modifiable risk factor in the burden of disease in Australian women. Regular physical activity confers significant physical, social and mental health benefits. Intervention studies aimed at promoting increased physical activity have been trialled in many different settings including primary care, worksites and the community. Churches have been successfully used as settings for health promotion in the USA, in programs exploring the connection between spiritual, mental and physical health. Churches are also potential settings for physical activity promotion. However, little is known about the effectiveness of this setting for promoting physical activity, particularly in Australia. The purpose of this study was to evaluate the effectiveness of a mind, body and spiritually-based health promotion program in increasing physical activity, self-efficacy, and social support, decreasing physical activity barriers, and promoting mental and spiritual health. Nineteen women completed the 8-week intervention, and 30 women in a non-health related 8-week program at the same church comprised a comparison group. Pre- and post-program surveys assessed outcome measures. One-way MANOVA's examined between-group differences in changes in outcomes over time. Physical activity increased significantly in the intervention group compared to the comparison group, as did social support and self-efficacy. The intervention group's perceived physical activity barriers decreased significantly compared to the comparison group and mental health (depression symptoms) also improved significantly. Furthermore, the spiritual health of the intervention group increased significantly more compared to the comparison group. The data highlight the potential for a church-based setting and holistic approach to health promotion as a successful means of increasing physical activity and promoting mental and spiritual health among Australian women.

# CHAPTER 1

## LITERATURE REVIEW

### 1.1 Health benefits of physical activity

#### 1.1.1 Physical activity definitions

Physical activity is defined as any bodily movement produced by skeletal muscles resulting in an expenditure of energy (Sallis and Owen 1999). This encompasses many different types of activities, which can be categorised according to the domain in which they are performed. Exercise is a type of physical activity that is planned or structured and is completed in order to maintain or improve a component of one's fitness (for example, muscular strength or endurance). The most common form of reported physical activity in the literature is leisure-time physical activity. Leisure time physical activity is usually performed outside of one's occupational and domestic duties, and relates to free time when people can choose the activity they would like to do. Activities may include, for example, walking, jogging, callisthenics, golf, or swimming (US Department of Health and Human Services [USDHHS] 1996; Sallis et al. 1999). Other domains of physical activity include occupational physical activity, which incorporates general labour tasks undertaken as part of one's job; transportation physical activity, such as cycling or walking while moving from one place to another; and domestic physical activity, such as household chores (eg. sweeping floors or washing windows), or gardening (USDHHS 1996; Sallis et al. 1999).

#### 1.1.2 Physical activity benefits to physical health

The health benefits of physical activity have been extensively studied. Physical activity has been clearly shown to reduce all-cause mortality (Blair, Kohl, Barlow, Paffenbarger et al. 1995; USDHHS 1996; Bauman 2004). Regular moderate physical activity such as walking has been shown to significantly reduce the risk of all-cause mortality (Kushi, Fee, Folsom, Mink et al. 1997; Manson, Hu, Rich-Edwards, Colditz et al. 1999). Furthermore, there is evidence to suggest a dose response relationship, where more

physical activity provides additional benefit to health (Kushi et al. 1997; Bauman, Bellew, Vita, Brown et al. 2002).

Compared to the inactive, individuals who regularly exercise moderately or vigorously have been found to suffer less from cardiovascular disease (including coronary heart disease, stroke and hypertension); the inactive having between 1.5 – 2 fold higher risk of disease (Blair et al. 1995; USDHHS 1996; Bauman 2004). The greatest public health gains are achieved through shifting the sedentary in the population to a moderate level of physical activity (Kushi et al. 1997).

Exercise has also been found to prevent and aid the control of diabetes and osteoporosis, and to reduce the risk of some cancers and high cholesterol (Bauman et al. 2002; Bauman 2004; Miller and Dunstan 2004). The prevention of colon cancer with increased physical activity has the strongest evidence, with up to one-fifth of all colon cancers attributed to inactivity (Bauman et al. 2002). Physical activity has also been linked to prevention of breast cancer, and although the evidence is not as clear, a reduction in risk of 20-30 percent has been demonstrated (Bauman et al. 2002). In women in particular, there is strong evidence of the benefits of moderate physical activity; for example, leisure-time walking, and the prevention of type 2 diabetes (Hu, Sigal, Rich-Edwards, Colditz et al. 1999; Bauman 2004).

Physical inactivity is responsible for an annual direct cost to the health care system in Australia of approximately \$377 million and causes nearly 8,600 deaths per year from preventable coronary heart disease, diabetes, colon cancer, breast cancer and stroke (Stephenson, Bauman, Armstrong, Smith et al. 2000). As such, physical inactivity is ranked as the second largest risk factor for disease and disability after tobacco in Australia (Mathers, Vos and Stevenson 1999). Among women in Australia, physical inactivity is the leading modifiable risk factor in the overall burden of disease (Mathers, Vos, Stevenson and Begg 2000). The chronic physical health conditions associated with physical inactivity are the leading causes of morbidity and mortality among women in Australia, and other developed countries (Mathers et al. 2000).

### **1.1.3 Physical activity benefits to mental health**

Physical activity also confers significant benefits to mental health. Women particularly are at increased risk of several mental health conditions. Australian women have been shown to have a higher rate of anxiety disorders than men (12% compared to 7%) with the highest rate occurring in women aged 45-54 yrs (16%) (Australian Bureau of Statistics (ABS) 1997). Mood disorders including depression are also more prevalent in young women (18-24yrs), being three times higher than the young Australian men (ABS 1997). Women over the age of 35 years were also found to be more likely to have a mental disorder than men (ABS 1997). Mental health is improved in the physically active, who experience less stress, anxiety and depression (Commonwealth Department of Health and Family Services 1998; Paluska and Schwenk 2000).

### **1.1.4 Physical activity benefits to social health**

There are also social benefits of physical activity. For example, participation in structured sport or recreational physical activity provides opportunities for individuals to build relationships with others and build community support. Being a member of a group such as a sporting team has been found to increase health, especially mental health, by preventing depression and social isolation (Victorian Government 2000; Bauman et al. 2002).

## **1.2 Descriptive epidemiology of physical activity**

The national physical activity guidelines for Australians recommend that adults should participate in at least 30 minutes of accumulated moderate intensity exercise (for example walking or cycling), on all or most days of the week (Commonwealth Department of Health and Ageing 2003). A total of 150 minutes per week in moderate physical activity was determined "sufficient" for health benefits. These guidelines were adapted from the Centres for Disease Control and the American College of Sports Medicine, and should be achievable by the Australian population, including minority groups. A number of key health and government organisations in Australia including the

National Heart Foundation, the Australian Institute of Health and Welfare, state and territory departments of human services and the Victorian Health Promotion Foundation (VicHealth), have recognised promoting physical activity as a priority health issue.

Large proportions of the adult population in many developed countries including the US, Canada, the UK, Europe and Australia are insufficiently active for health benefits (USDHHS 1996; Lindstrom, Isacsson and Merlo 2003; Bryan and Walsh 2004; Shapo, Pomerleau and McKee 2004). In a report on physical activity and health by the US Surgeon General, about one quarter of the US adult population was found to engage in no leisure-time physical activity (USDHHS 1996).

In Australia, three national physical activity surveys have been conducted in 1997, 1999, and 2000 (Armstrong, Bauman and Davies 2000; Bauman et al. 2002). In the first survey, 62% of the population achieved the physical activity recommendations sufficient for health benefits. In 1999 and 2000, this proportion decreased to 57% with about 15% of adult Australians being completely sedentary (Bauman et al. 2002; Brown 2004). In Victoria, 50% of the population is insufficiently active to achieve health benefits (Smith, Owen, Leslie and Bauman 1999).

Within populations certain subgroups are at particular risk of inactivity. According to the US Surgeon General's Report (1996), more women than men in the US were inactive, with the prevalence of inactivity in white women between 23.1 - 29.0%. In Australia, women are much less active in their leisure time than men, with 20% more likely to report no leisure-time physical activity. Married women with children are also less likely to be active than single women of the same age (Bauman et al. 2002). In addition, older adults, people from non-English speaking backgrounds and of low socioeconomic status are likely to be less active (Department of Human Services, 1998). In Victoria, 51% of women compared to 34% of men were not active enough to achieve health benefits (Smith et al. 1999). Additionally, unemployed women and women with sole child-care duties were the least active (Salmon, Breman, Fotheringham, Ball et al. 2000). Given the high rates of inactivity (despite well known health benefits), the development and trialling

of interventions to promote increased physical activity, particularly among women, is an increasingly important public health priority.

### **1.3 Behavioural change – The Social Cognitive Theory**

It is useful for health behaviour interventions to use a theoretical model of behaviour change as a guiding framework. It has been argued that interventions based on a theoretical framework are more effective than atheoretical approaches (Sallis et al. 1999). One of the most commonly used and effective theoretical frameworks is Bandura's (1986) Social Cognitive Theory (SCT). This theory posits that there is a reciprocal relationship between behaviour, intrapersonal, physical environment, and social factors "whereby determinants both influence, and are influenced by, the behaviour" (Sallis, Hovell, Hofstetter and Barrington 1992, p30). Many effective health behaviour modification interventions have been constructed from this theory (Sallis et al. 1992; Schmid, Pratt and Howze 1995; Netz and Raviv 2004). Given the theory's widespread use and effectiveness in guiding behaviour change interventions, this theory was adopted as a guiding framework for the present study. The key elements of the SCT that were drawn on in this study are reviewed briefly below.

#### **1.3.1 Intrapersonal factors**

Only a few intrapersonal psychological constructs of the SCT have been studied extensively, mainly self-efficacy and perceived barriers to physical activity (Sallis et al. 1999; Netz et al. 2004). Other intrapersonal factors less researched, but included in this category are outcome expectations and behavioural capability.

Self-efficacy (Bandura 1986) is one of the most important SCT constructs and psychological determinant of physical activity behaviour. It represents an individual's belief in their own ability to be physically active in a variety of situations (Sallis et al. 1999). For example, a person with high self-efficacy would be confident they could exercise in a specific situation, such as bad weather. Prospective studies have shown the predictive relationship between self-efficacy and physical activity. One such two-year follow-up study of a large community sample by Sallis, Hovell, Hofstetter and Barrington

(1992), found baseline self-efficacy to be the strongest predictor of physical activity levels two years later. Additionally, change in self-efficacy was also found to predict change in physical activity (Sallis et al. 1992).

Perceived barriers to physical activity, another intrapersonal construct from the SCT, are numerous and can have a strong negative effect on intention to change behaviour (Sallis, Hovell, Hofstetter, Faucher et al. 1989). The most commonly reported physical activity barrier is 'lack of time' (Dishman, Sallis and Orenstein 1985). A study of women found that lack of time, lack of money, and no facilities were the most common perceived barriers to starting an exercise program (Johnson, Corrigan, Dubbert and Gramling 1990). Life stresses were found to be a barrier to exercise in a sample of 82 women who completed exercise and stress diaries (Stetson, Rahn, Dubbert, Wilner et al. 1997). In that study, even only mildly stressful events that occurred on numerous occasions inhibited exercise adherence. A relationship was found between stressful weeks and a decrease in exercise time as well as a decrease in self-efficacy (Stetson et al. 1997). Promoting moderate-intensity physical activity rather than vigorous physical activity has been suggested as one method for lowering perceived barriers among the sedentary in the population (Dishman 1994). Shifting the focus from fitness to enjoyment and social benefits of physical activity is one approach that may be considered appealing to sedentary individuals.

### **1.3.2 Environment/situational factors**

The most frequently studied construct from the physical environment/situation component of the SCT is social influences, which generally include observational learning and social support. Observation learning occurs when an observer adopts the behaviour that others are seen to be engaging in (Dishman 1994). Social support may take the form of exercising together, discussing exercise in a small group, or just encouragement to exercise from family and friends (Sallis, Grossman, Pinski, Patterson et al. 1987). There are many different aspects of social support and a number of physical activity interventions that have assessed this construct have found a positive relationship with physical activity (Sallis et al. 1999). Duncan, Duncan and McAuley

(1993) studied the effects on exercise adherence of different aspects of social support, including emotional support, network support, reassurance of worth/esteem support, tangible aid/guidance, informational support and the opportunity for nurturance. In women (n=38), social support (in particular, reassurance of worth and guidance) distinguished adherers and non-adherers (Duncan et al. 1993).

Other environmental constructs hypothesised to influence physical activity behaviour in the SCT are accessibility and availability of resources (may include distance to gym or sporting ground, bike paths, walking tracks etc) and environmental aesthetics and safety (how enjoyable the scenery is, and safety of the environment) (Sallis, Bauman and Pratt 1998).

## **1.4 Settings-based physical activity intervention studies among women**

Many strategies to increase levels of physical activity in different population groups have been trialled. Targeting a particular location or setting, where a population can be found provides a unique opportunity to influence health in everyday life. By increasing the health potential of settings where people live, work and play, a supportive environment can be provided to help individuals to make healthy decisions. Some of these settings in which physical activity interventions have been trialled include schools, primary health care settings, workplaces and communities. Following is a general summary of different settings and the physical activity interventions trialled in each of these.

### **1.4.1 Primary care settings**

General practice (GP) is one setting for physical activity interventions. The main advantage of this location is that a large proportion of the general public regularly visits a GP, and generally GP's are trusted as a good source of health information (Bauman et al. 2002). The interventions in the GP setting typically involve verbal education on increasing physical activity from the practitioner to the patient, and sometimes the addition of written materials or prescription of physical activity (Bauman et al. 2002). One

review of the literature conducted by Ashenden, Silagy and Weller (1997) reported that the majority of GP interventions resulted in a significant increase in physical activity with differing measures in the short term (an average follow-up of 2 months) which is encouraging, but noted that many studies failed to conduct long-term follow-up. The only physical activity intervention in the primary care setting to mention gender differences, compared GP advice to combined GP advice with follow-up contact from an exercise scientist, and combined GP advice with pedometer use (Armit, Brown and Marshall 2004). Findings suggested that women were more receptive than men to the combined treatments (the follow-up calls and the pedometers). The results look promising for future primary care-based physical activity interventions, although there is a need for more research with longer follow-up and a need to identify effectiveness on subgroups such as women or men (Bauman et al. 2002).

#### **1.4.2 Workplace settings**

The worksite has also been a setting for many physical activity promotion campaigns, although many have not been formally evaluated (Dishman, Oldenburg, O'Neal and Shephard 1998). The benefits of worksite health promotion include the potential to lower costs to the employer via reduced absenteeism and decreased work cover payouts. A healthy staff workforce has been linked with increased productivity in the workplace and reduced musculoskeletal injuries (Kahn, Ramsey, Brownson, Heath et al. 2002). Worksite physical activity interventions vary and have included screening for risk factors of disease, educational seminars, discounted gym membership or on site exercise classes (Bauman et al. 2002). A meta-analysis of 26 studies by Dishman and colleagues (1998) concluded that the evidence of effectiveness of worksite interventions was weak and more research was needed. A more recent review by Marshall (2004) found that workplaces that encouraged incidental activity around the worksite and more personal tailored interventions were much more effective than large organised corporate initiatives. One worksite physical activity intervention that reported gender differences in effectiveness of the program was conducted in Alberta, Canada, and found no significant differences between males and females in the key outcome measures (Plotnikoff 2004). Another worksite intervention in Australia identified that women had a

tendency to increase their walking as a result of the intervention compared to men who increased vigorous physical activity; although these results were not statistically significant (Marshall, Leslie, Owen and Bauman 2004). Clearly there is a lack of literature on the effectiveness of worksite physical activity interventions in women particularly.

### **1.4.3 Community settings**

Community-based approaches are geographic area-based or population-wide strategies that may include mass-media campaigns or environmental and policy change, either singly or in combination. Mass-media campaigns have been found to be effective in increasing awareness of physical activity, but less effective in bringing about physical activity behaviour change (Marcus, Owen, Forsyth, Cavill et al. 1998; Bauman et al. 2002). Mass media campaigns appear most useful when part of a multi-level community physical activity intervention designed to bring about behaviour change (Bauman et al. 2002).

Environmental and policy community-based interventions have the potential for being the most effective strategies for promoting behavioural change, as they are designed “to alter or control the physical or social environment... address availability, accessibility, or social norms” (Schmid et al. 1995, p.1208), and hence make healthy choices easier. In Australia, environmental and policy interventions have been successful health promotion strategies in the areas of smoking, bike helmet usage, seat belt wearing and changing the food supply to make low-fat milk available (Schmid et al. 1995). This indicates the potential for similar successes in increasing physical activity. Other countries have shown positive physical activity behaviour changes from environmental and policy interventions (Brownell, Stunkard and Albaum 1980; Linenger, Chesson and Nice 1991; Vuori, Oja and Paronen 1994; Blamey, Mutrie and Aitchison 1995), but in Australia this is an emerging area with little to no published evaluations of this type of intervention.

There is a wide variation of environmental and policy community interventions. One simple initiative, the posting of signs to promote the benefits of using the stairs, adjacent

to escalators and stairwells was successful in increasing stair usage during the intervention (Brownell et al. 1980; Blamey et al. 1995). Other studies have reported more complex interventions involving multi-sectoral approaches including policy changes (release time at work for physical activity), improving the physical activity environment (adding bike tracks) and promoting the use of physical activity resources (Linenger et al. 1991; Vuori et al. 1994). Limited evaluation was completed in these studies, and the use of military personnel in the Linenger et al. study makes generalisations difficult. However, small increases in physical activity were positive nonetheless. In Australia, the 10,000 Steps Rockhampton program is an example of a multi-strategy community-based physical activity promotion intervention. The multi-strategies used in that program included local media campaigns to raise awareness of the program theme (10,000 Steps), general practice and allied health-care providers who promoted physical activity, community partners in a variety of sectors improving social support among disadvantaged groups, policy and environmental changes, and community initiatives and competitions to increase physical activity in local neighbourhoods (Mummery, Brown, Schofield, Caperchione et al. 2004). Although this project is currently ongoing, primary outcomes have already shown an increase in awareness of physical activity, significant improvements in social support and self-efficacy, and increased walking for leisure (Steele, Austin and Mummery 2004). The development of interventions like this multi-level community program that address environmental and policy issues is a major task requiring cooperation of local and state governing bodies, but has much potential for lasting increases in physical activity. A need for information on the effectiveness of these large scale community interventions among women is also needed, as to date there is no evidence suggesting gender-specific efficacy.

In summary, there remains much to be learned about the most effective strategies for promoting physical activity in different settings, with even less known about effectiveness in women specifically. Given that women are at increased risk of physical inactivity, there is a need for further research on these issues.

## **1.5 Churches as a setting for health promotion**

One setting that has only recently been utilised as a location for physical activity interventions is the local community church. Mental and spiritual health factors, for example, body image, depression, and attitudes to spirituality are all related to physical health (Lottes, Engstrom and Engstrom 2002). For this reason, the church-based setting, which typically involves a holistic approach to health behaviour change, in which physical, mental and spiritual health is addressed, has the potential for multiple impacts on various domains of health. Spiritual health is difficult to define and is usually considered in the context of one's relationship to a supreme being. The traditional definition of spirituality is "a basic or inherent quality in all humans that involves a belief in something greater than the self and a faith that positively affirms life" (Miller 1995, p257). A benefit of the church setting for behaviour change is the existing social support structure. Church support groups have been shown to be supportive in assisting individuals to initiate and maintain behaviour change (Lasater, Becker, Hill and Gans 1997; Prohaska, Peters and Warren 2000).

Churches have been the setting for many health interventions in the past, as they provide a means to access hard-to-reach target groups, especially low socioeconomic status communities, and different cultural groups (Hatch, Cunningham, Woods and Snipes 1986; Lasater, Carleton and Wells 1991; Peterson, Atwood and Yates 2002). While holistic medicine was commonplace in early medicine (1800's), only recently, however, has there been a resurgence of interest and a new body of literature has emerged researching the connection between spiritual and mental health, and physical health. Literature showing correlations of health benefits and greater longevity with religious practices like attending church and praying have been well documented (Hancock and Perkins 1985; Mullen 1990; Powell, Shahabi and Thoresen 2003; Seeman, Dubin and Seeman 2003). A large portion of this literature focuses on recovery from acute and chronic life-threatening diseases and links between coping mechanisms, physical health and spirituality. A review of the literature by Powell et al. (2003) found evidence of associations between religion or spirituality and prevention of disease in

healthy people, with seven independent studies on large samples showing healthy church attendees to have a 30% reduction (after adjustment for cofounders) in risk of all-cause mortality compared with healthy non-attendees. Benefit was also found in patient recovery from disease and response to stress (Baldacchino and Buhagiar 2003; Kinney, Rodgers, Nash and Bray 2003; Koenig 2003; Powell et al. 2003). The mechanisms underlying these associations are not yet completely understood.

With evidence suggesting a correlation between spirituality and physical health, researchers have turned their attention to investigating the effectiveness of church-based interventions for promoting health behaviours including improved diet, smoking cessation and physical activity. The majority of this literature has been conducted with ethnic women, mainly African-American and Hispanic women, as a high percentage describe themselves as Christians and endorse the Christian concept of spirituality (Musgrave, Allen and Allen 2002).

The majority of health promotion interventions utilizing the church-based setting in the past have been oriented around general disease prevention, for example screening for risk factors for chronic disease. For example, in an intervention conducted by Kotecki (2002), pre- and post-testing was completed on a sample of 63 African-American participants in an 8-week educational church-based intervention focused on topics such as first aid, drug and alcohol use and general disease prevention. The pre-post test of health promotion knowledge retention showed significant improvement in health knowledge compared to baseline (Kotecki 2002). However, this study included no comparison group. Other research with African-Americans in a church-based setting has been found to promote positive changes in attitudes and behaviours relating to smoking (Voorhees, Stillman, Heagerty, Levine et al. 1996). Gender differences and numbers were not reported in that study.

'Lose Weight and Win' was a project set in an African-American church in Baltimore (n=187) and was designed to decrease body weight and blood pressure (Kumanyika and Charleston 1992). The intervention consisted of weekly education and exercise

sessions for 8 weeks. Pre- and post-program weight and blood pressure was measured on the 53% of women who completed the study which found a significant within-person weight loss of about 2-3% of initial weight lost. Unfortunately physical activity was not measured, and follow-up response rate was low. There was no comparison group or randomisation in this study, and the lack of intention-to-treat analysis and the high attrition rate provide serious limitations to any generalisation of the data.

The church has also been used as a setting for interventions aimed at increasing fruit and vegetable intake. Campbell et al. (1999) undertook a large randomised trial of 50 African-American churches in North Carolina (n=2519) in 'The Black Churches United for Better Health' project. Churches were randomised to intervention or a two-year delayed intervention group. A survey was administered at baseline, one and two years follow-up. The intervention ran for 20 months and was based on an ecological theoretical framework involving multiple components including tailored print material, educational components on nutrition, cooking and food preparation, gardening and planting of fruit and vegetables, and serving more fruit and vegetables at church functions. At the two-year follow-up the intervention group had significantly improved their fruit and vegetable intake by 0.85 of a serve per day, and the percentage who consumed the recommended five serves a day significantly increased compared to the delayed intervention group (Campbell et al. 1999). Another fruit and vegetable intervention based in African-American churches, the 'Eat for Life Trial' (Resnicow, Jackson, Wang, De et al. 2001) had a similar success with the intervention group increasing fruit and vegetable intake by 1.1 serves per day compared to the other groups. In that trial, 14 churches were randomised to one of three groups, a delayed intervention group, a self-help group or the intervention group. The intervention consisted of motivational telephone counselling, print material and an educational video. The sample was 73% female, with no significant differences in outcome measures between sexes. The successes of these two comprehensive trials shows potential for health behavioural change in the church-based setting.

## **1.6 Church-based physical activity interventions**

Physical activity interventions conducted in the church setting are few, with the majority involving African-Americans. Hatch et al. (1986) conducted a study on “The fitness through churches project”, an intervention aimed at the African-American population in North Carolina. The objectives of the study were to train 30 community members as fitness instructors selected by pastors from 10 different churches in order to assist the churches in establishing health promotion programs, in particular, aerobics classes. The study resulted in a total of 14 women who completed the 7-week fitness instructor training, but the study provided no report on any health promotion initiatives commenced in any churches. Improvements in measures of blood pressure, body circumferences including bust, abdomen, hips and waist, and heart rate change in the 14 aerobics trainees were reported as evidence of program effectiveness, and qualitative data from semi-structured interviews completed during the information gathering phase was also described briefly. Disappointingly, no follow-up literature is available on any health promotion initiatives resulting from this intervention.

Yanek et al. (2001) showed a holistic program was effective in improving cardiovascular disease risk profiles (positive self-reported dietary and physical activity change) one year after completing the program in church-going African-Americans. The intervention ran for 20 weeks and each church was randomised to one of three interventions: a self-help control group, a behavioural model-based group program (social learning theory) and the same behavioural-based program with an added spiritual component. There was no difference in outcomes between the two intervention groups, as the participants in the group without the spiritual component voluntarily added it in themselves as “the women did not believe there could be any church-based program that was not spiritual” (Yanek et al. 2001, p74). Thus the authors discussed the benefits of the church-based setting rather than the comparisons of spiritual components in this study.

The above church-based physical activity interventions highlight several limitations inherent in the published literature to date. These programs have been primarily

conducted with African-American populations and the generalizability to other groups is unknown. In addition, many of the studies lack experimental study designs including randomisation and comparison groups. Poor measurement of program outcomes, in particular physical activity, and atheoretical approaches of interventions are also major limitations.

Perhaps the soundest methodological study promoting physical activity in a church-based setting is the 'Health Body/Healthy Spirit' project currently being conducted among African-Americans from 16 Atlanta churches (Resnicow, Jackson, Braithwaite, Dilorio et al. 2002). Churches were randomised to one of three groups, a comparison, self-help or intervention group. The intervention received print media and telephone counselling calls based on a combination of psychotherapy and behavioural change theories. Physical activity measures in the form of minutes of moderate to vigorous physical activity per day were measured at baseline and will be measured post-intervention and at one year follow-up. However this study is ongoing with no effectiveness data currently available.

In Australia, one church-based intervention has been published in the Greek-Australian migrant women population (Brown, Lee and Oyomopito 1996). This intervention used a 12-week program previously trialled with success in Polish-Australians (non-church based), tailored specifically for women of non-English speaking backgrounds (Brown and Lee 1994). This program differed slightly to other church-based physical activity interventions because while the intervention group was conducted in a church-based setting, the comparison group was not church-based. Participants in the Greek-Australian women study intervention group (n=26) were recruited through the Greek-Orthodox church, and hence the program was run in the church building to make use of existing support groups. The major limitation with this study design is the fact that the comparison group (n=22) was recruited from a different location and although the same nationality, were not church-going. Small improvements in physical activity (exercise heart rate) and anthropometry (waist and hip measurements and skin folds) within the intervention group over the 12 weeks were demonstrated. After 12 weeks of follow-up,

the authors attributed the maintained success of the Greek-Australian women (more so than with the Polish-Australian women), to the use of existing social groups in the church (Brown et al. 1996). The 12-week program used in these two studies on migrant women with non-English speaking backgrounds did not have a spiritual or mental health component. The difference in intervention and comparison groups' church-going status and the lack of randomisation were limitations in these studies.

The literature reviewed here demonstrates the scarcity of the physical activity interventions in the church setting. While the limited studies show promise, there have been no church-based holistic physical activity intervention studies reported in Australia, and hence the effectiveness of such programs among Australian women is unknown. The need for sound study designs including comparison groups, sufficiently long follow-up times and strategies to minimise attrition rates is also evident.

## **1.7 Summary**

Even though the physical and mental benefits of physically activity are relatively well documented, Australian and international findings have demonstrated that the majority of the population is insufficiently physically active for health benefits. This is particularly the case among Australian women. While interventions to promote physical activity have been trialled in a number of different settings, further research on the effectiveness of different settings-based approaches for increasing women's physical activity is required.

Church-based settings for health promotion have been successfully used to change health behaviour in the African-American population, the benefits of this setting being access to hard to reach populations, the existing social support structure, and the holistic focus of interventions including a spiritual or religious component. The effectiveness of church-based settings for promoting physical activity among Australian women is currently unknown.

Evidence suggests incorporating a theoretical model of behaviour change may result in more successful physical activity interventions. The social cognitive theory provides a useful framework for promoting physical activity, with its focus on relationships between personal, environmental and behaviour factors.

This study, which is the first of its kind in Australia, adopts a mind-body-spirit, theoretically based approach to promoting healthy behaviour, including educational, social support, and experiential components. The study targets Australian women, a group previously shown to be at high risk of inactivity and associated health outcomes.

## **1.8 Study aims, objectives and hypothesis**

The aim of this project was to evaluate the effectiveness of a mind, body and spiritually based health promotion program in women aged 18-70. In particular the study aimed to examine the effects of the program on the key outcome: physical activity; and secondary outcomes: self-efficacy, social support and personal barriers to physical activity. Program effects on aspects of mental and spiritual health were also assessed.

The specific study hypotheses were:

1. Participants in the intervention group will show significantly greater improvements in levels of physical activity following the intervention than will participants in the comparison group.
2. Participants in the intervention group will report significantly greater increases in physical activity self-efficacy and physical activity social support, and greater decreases in perceived barriers to physical activity following the intervention than will participants in the comparison group.
3. Participants in the intervention group will report greater improvements in mental and spiritual health, with significantly greater decreases in depressive symptoms and negative body image, and significantly greater increases in spiritual health following the intervention than will participants in the comparison group.

## **CHAPTER 2**

### **METHODS**

#### **2.1 Study design**

This research project was conducted as part of an existing externally run program which was provided by Careforce Lifekeys Ministries, an initiative of a local church. The program was piloted twice in 2003 and was well received by participants, but had not been formally evaluated. A pre-post test, intervention-comparison group design was used to assess the effectiveness of the intervention.

#### **2.2 Participants**

Participants in both the intervention and comparison groups were recruited through local newspaper advertisements, church newsletters, and verbal announcements via a testimonial video clip played during Sunday church services. All participants in both the intervention and comparison groups paid a fee of \$70 (\$7 per session) to cover the administration cost of each program. Participants were deemed eligible if they were women between the ages of 18-70 years and were able to commit to attend at least 8 of the 10 sessions of the program. Participants in the intervention group were also required to obtain written medical clearance from a physician, and to agree to participate in the group physical activity component of each session and be prepared to increase their physical activity level outside the program up to 3 times per week. All participants received a plain language statement describing the study aims and methods (see Appendix 1 and 2), and provided written informed consent before commencing the program (Appendix 3). This research project was approved by the Deakin University Human Research Ethics Committee.

Participants in both the intervention and comparison groups were advised that participation in the research project was not obligatory and would not impact on their participation in either program. The purpose of the research and reasons for

assessments were fully explained to participants. Since this study is the first of its kind in Australia, a modest sample size was selected to pilot the effectiveness of the intervention.

## **2.3 Materials**

Participants in both the intervention and the comparison groups were asked to complete a variety of questionnaires to assess the outcome measures: physical activity, self-efficacy, social support, mental health, and spiritual health. All measures were taken at baseline and week 8, immediately pre- and post-intervention. Demographics assessed at baseline included participant age, gender, marital status and education (Appendix 4; Questions 12-16). Self-reported weight and height were also included in the baseline and week 8 surveys (Appendix 4; Questions 17-18). Body mass index (BMI) was then calculated using the formula body weight (kg) / height (m<sup>2</sup>).

### **2.3.1 Physical activity**

Physical activity was assessed using the self-report, self-completion survey instrument called the CHAMPS (Community Healthy Activity Models Program for Seniors), a published scale developed and validated in the US, which assesses physical activity behaviours and attitudes (Stewart, Mills, King, Haskell et al. 2001; Appendix 4; Pages 58-66). This measure has been shown to be sensitive to change in four physical activity trials in the US (King, Rejeski and Buchner 1998; King 2000; Stewart et al. 2001; Stewart, Verboncoeur, McLellan, Gillis et al. 2001), and one trial in Australia (Ball, Salmon, Leslie, Taylor et al. 2003).

Consistent with the focus of the intervention, two components from the CHAMPS questionnaire were used to indicate physical activity. Firstly, participants' time spent walking was assessed by summing the total weekly duration recorded for each CHAMPS item for this variable (which included brisk walking, hill walking, leisurely walking and walking for errands) and converting to hours per week. Secondly, participants' time spent in moderate and vigorous physical activity (MVPA) was

assessed by combining CHAMPS activities of 3-6 metabolic equivalents (METs; moderate intensity; Ainsworth, Haskell, Leon, Jacobs et al. 1993) or greater than 6 METs (vigorous intensity), and converting to total duration in hours per week. To take into account the greater health benefits associated with higher intensity physical activity (USDHHS 1996), all CHAMPS items for activities of vigorous intensity (6 METs or greater) were weighted by two (Armstrong et al. 2000). It should be noted that the two measures of physical activity (walking, MVPA) were not mutually exclusive, as there was some overlap of walking activities counted in the two measures.

### **2.3.2 Self-efficacy, social support and personal barriers**

Aspects of the social cognitive theory - namely physical activity self-efficacy and social support - were assessed using validated scales (social support: Sallis et al. 1987; self-efficacy: Marcus, Selby, Niaura and Rossi 1992). The physical activity self-efficacy score was computed by averaging five items for each participant (Appendix 4; Questions 1a-1e). These five items were questions asking about how confident the participant was to go for a walk in a variety of situations (*Even when I am tired; in a bad mood; I don't have time; I am on a vacation; even when it is raining*) and in the present study had an internal reliability of .83 (Cronbach's Alpha). The physical activity social support from family and friends score was computed by summing four items together (Appendix 4; Questions 3a-4b). These four items included two questions about family support and two questions about support from friends (*How often did members of your family/friends do physical activity with you / encourage you to be physically active?*). These four items had an internal reliability of .65 (Cronbach's Alpha). With both measures, the higher the score, the greater self-efficacy or social support.

Barriers to physical activity were also assessed using a list of items derived from the Pilot Survey of the Fitness of Australians (Department of the Arts Sport the Environment and Territories 1992; Booth, Bauman, Owen and Gore 1997). Since the intervention program focussed primarily on overcoming physical activity barriers of a personal nature, (eg. lack of motivation, knowledge or skills), the personal barriers were the focus of this part of the assessment. The total number of personal barriers was calculated by

summing the eleven items for each participant (Appendix 4; Questions 5b; c; g; h; j; k; m-q). These eleven items included questions relating to specific barriers to physical activity eg. *Feel too overweight, no motivation* and *do not have time*. Internal reliability for these eleven items was .88 (Cronbach's Alpha). All three scores for each measure, self-efficacy, social support and personal barriers, were treated as continuous data in analyses.

### **2.3.3 Mental health**

Aspects of mental health, in particular depression and body image, were assessed using validated scales (depression: CES-D developed by the US Institute of Mental Health, body image dissatisfaction: Ball and Lee 2002). The symptoms of depression score was calculated by reversing the score on the positively worded items and summing the 20 items (Appendix 4; Questions 6a-t). A higher score represents greater levels of depressive symptoms (Radloff 1977). The 20 items had an internal reliability of .91 (Cronbach's Alpha). The body image score was also determined by summing two questions together (*How dissatisfied have you felt about your weight?* and *Your shape?*; Appendix 4; Questions 7a-b). Internal reliability for these two items was .88 (Cronbach's Alpha). The higher the body image score, the higher the participants' negative body image.

### **2.3.4 Spiritual health**

Spiritual health was assessed using a validated scale, the Spiritual Well-Being Scale (Ellison 1983). The spiritual well-being score was calculated by reversing the score on the negatively worded items and summing the 20 items (Appendix 4; Questions 11a-t). The 20 items had an internal reliability of .94 (Cronbach's Alpha). The higher the spiritual well-being score, the better the participants' spiritual health.

## **2.4 Procedure**

### **2.4.1 Intervention Group**

This ten-session, eight-week women's health program titled "Embracing a Healthy Lifestyle", used a holistic mind-body-spirit framework, and involved education, social support and experiential approaches to promoting health. The program was conducted by trained staff with tertiary qualifications in nursing, personal training/fitness instruction, human movement, nutrition and physical education. During the first session (baseline), the initial survey was administered followed by an introduction/orientation to the program, including a program overview, course requirements, goal setting and a description of the holistic approach to health. The remaining sessions were conducted weekly at a local church. Each of these sessions included a 45-minute group teaching session on varying topics (see below), a 45-minute focus group discussing each topic, and a 30-minute moderate intensity group physical activity session. The topics covered in the education component in order included: aerobic physical activity, motivation, nutrition, emotional eating, body image, strength training, weight management, women's health issues, and long term maintenance of a healthy lifestyle. The focus group sessions provided discussion on the weekly topic and application to each individual in the group. Individual goals and barriers in each area were discussed and personalised suggestions for incorporating lifestyle changes were given by a qualified facilitator. The intervention also supported the women in identifying and accessing walking tracks and other physical activity facilities, clubs and support groups in their local neighbourhoods.

### **2.4.2 Comparison Group**

The comparison group was made up of individuals who had enrolled in a non-health-related relationship education and social support program also run by the same local church. That program was designed to help participants learn how to free themselves from negative past experiences and focus on the future, and to provide strategies and skills needed to make positive and lasting changes in relationships. The program was run concurrent to the intervention group for the same duration and at the same venue, and was hence matched on contact time (with a course instructor and with other group

participants) to the intervention group. Participants in the relationship program were invited to take part in the research study as a comparison group, which involved completing the same assessment measures as the intervention group, at baseline and post-intervention. Nothing further was required from the participants in the comparison group.

## **2.5 Statistical analysis**

All data were analysed using SPSS 12.0. Ten participants in total (3 from the intervention group and 7 from the comparison group) did not complete the week 8 survey. Data for these participants were included in analyses, and a conservative approach to imputing missing data was adopted (Pocock 1983) by which available baseline scores on variables were substituted for week 8 scores. A significance value of  $p < 0.05$  was adopted for all statistical tests. Where appropriate, continuous outcome variables were transformed using square root transformation to normalise their distributions. Baseline values of all demographic and outcome variables were examined for intervention group differences using independent t-tests for continuous measures, and chi-square tests for categorical measures.

For all of the outcome variables, a series of one-way MANOVAs were conducted to assess between-group differences in outcome measures over time (i.e. a time by group interaction). Follow-up paired t-tests were conducted to compare within-group differences over time.

Body weight has been previously established as a correlate of physical activity (DiPietro 1995). To assess the need to adjust for potential confounding by body weight in this study, correlations of BMI with each outcome measure were tested using Pearson's bivariate test for statistical significance. Where a significant relationship was found between baseline BMI and the outcome variable of interest, BMI was included as a covariate in a multivariate analysis of covariance (MANCOVA).

## CHAPTER 3

### RESULTS

#### 3.1 Demographics

Descriptive data on demographics and each of the outcome variables at baseline are presented in Table 1. With the exceptions of BMI, body image and personal barriers to physical activity, there were no other differences between the intervention and the comparison groups on any of the demographic or outcome variables. The mean BMI of the participants in the intervention group was significantly higher than that of participants in the comparison group ( $p=.037$ ). Negative body image was significantly higher in the intervention group than the comparison group at baseline ( $p=.029$ ). The average number of reported personal barriers to physical activity was also significantly higher at baseline in the intervention group than the comparison group ( $p=.024$ ).

Since BMI differed between the intervention and control groups, and given the widely reported associations of BMI with physical activity (DiPietro 1995), it was necessary to consider the possibility that BMI may confound associations between physical activity and other outcome variables for the intervention group. As described in Section 2.5.5, a series of correlation analyses examined associations of BMI with the outcome variables to check for potential confounding. Three of the outcome variables (personal barriers; body image and spiritual health) were significantly related to baseline BMI ( $p$  values  $<.05$ ). The MANCOVA's including these variables as outcomes therefore controlled for baseline BMI.

**Table 1:** Demographic and main outcome characteristics of the sample at baseline

	Intervention n=19	Comparison n=30
Age (mean, SD)	40.2 (10.4)	38.3 (13.0)
Range (MIN-MAX)	35 (22-57)	50 (18-68)
BMI (kg/m <sup>2</sup> ; mean, SD)	29.5 (7.0)	25.7 (5.2)*
Marital status (%)		
Married/defacto	74	63
Educational status (%)		
High school/Trade certificate	42	50
University or tertiary qualifications	58	47 <sup>1</sup>
Walking (hours/week; mean, SD)	3.3 (3.1)	3.6 (3.7)
Moderate and vigorous physical activity <sup>2</sup> (hours/week; mean, SD)	3.7 (2.8)	4.4 (4.5)
Walking self efficacy (mean score, SD)	3.1 (0.7)	3.2 (0.9)
Personal Barriers (mean score, SD)	3.0 (0.7)	2.5 (0.7)*
Social support (mean score, SD)	10.5 (3.0)	11.9 (3.7)
Depression (mean score, SD)	17.6 (12.3)	13.5 (8.4)
Body image (mean score, SD)	8.9 (3.2)	6.5 (4.3)*
Spiritual health (mean score, SD)	89.7 (22.6)	99.0 (15.1)

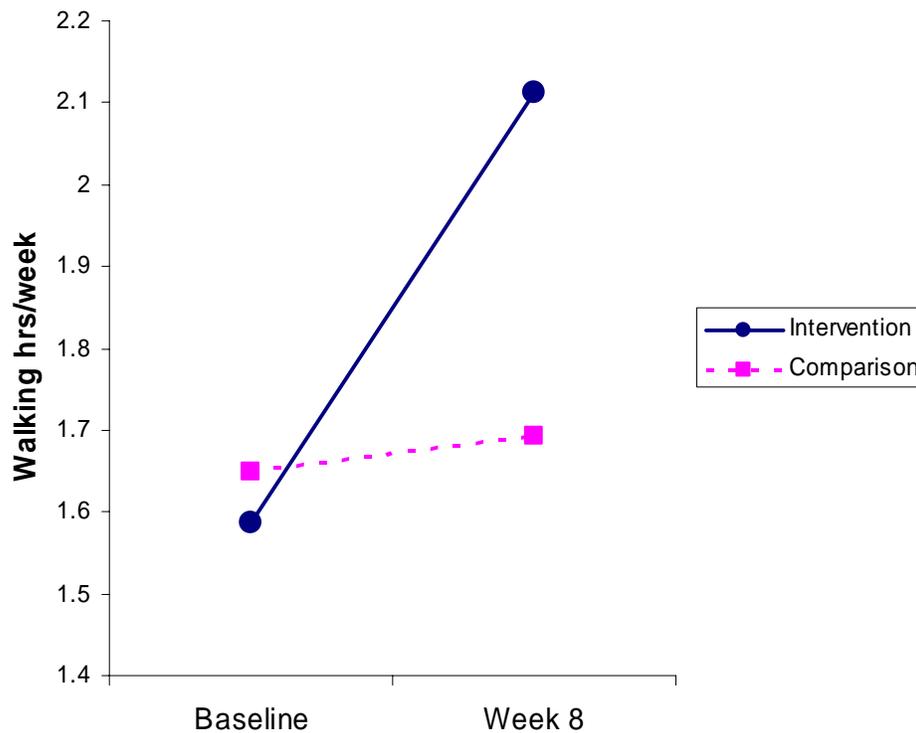
\* Difference between the intervention and comparison groups  $p < 0.05$ .

<sup>1</sup> 3% missing values for the comparison group's educational status.

<sup>2</sup> Vigorous physical activity weighted by 2.

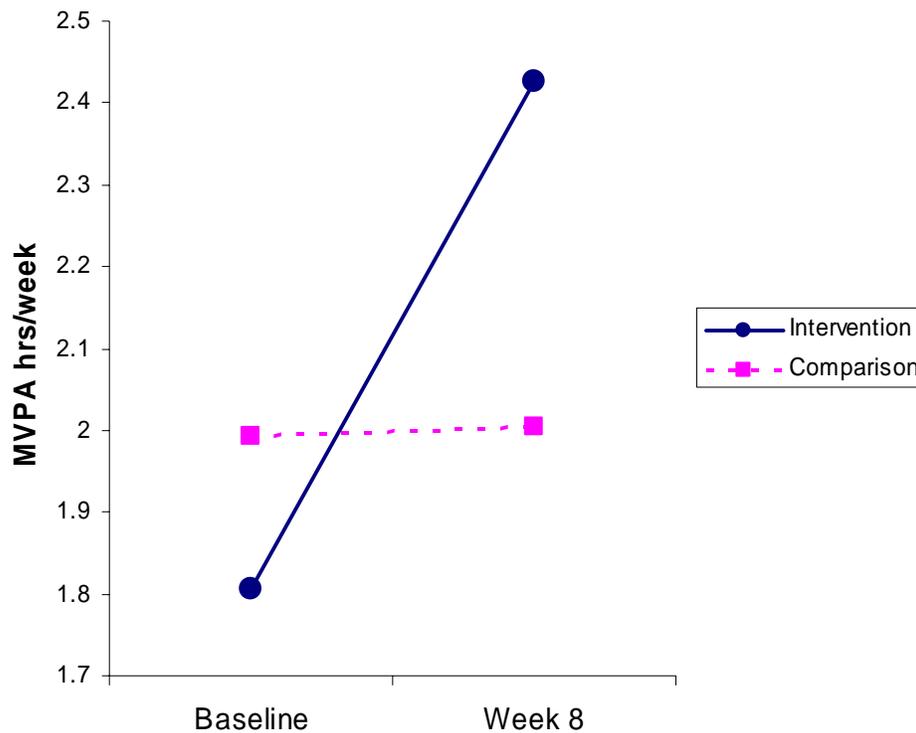
### 3.2 Physical activity

Mean time spent walking at baseline and week 8 for the intervention and comparison groups is presented in Figure 1. Results of the MANOVA predicting time spent walking showed a significant interaction between intervention group and time, suggesting that the difference between baseline and week 8 scores varied across the two groups (Wilks = .87,  $F(1, 46) = 6.96$ ,  $p=.011$ ). Follow-up paired t-tests showed that for intervention group only, time spent walking per week was significantly higher at week 8 compared to baseline (intervention: mean change .53 hrs/week, SD .71;  $t(18) = 3.22$ ,  $p=.005$ ; comparison: mean change .04 hrs/week, SD .55;  $t(28) = .44$ ,  $p=.664$ ).



**Figure 1:** Total time (hrs/wk) spent walking at baseline and week 8, by group

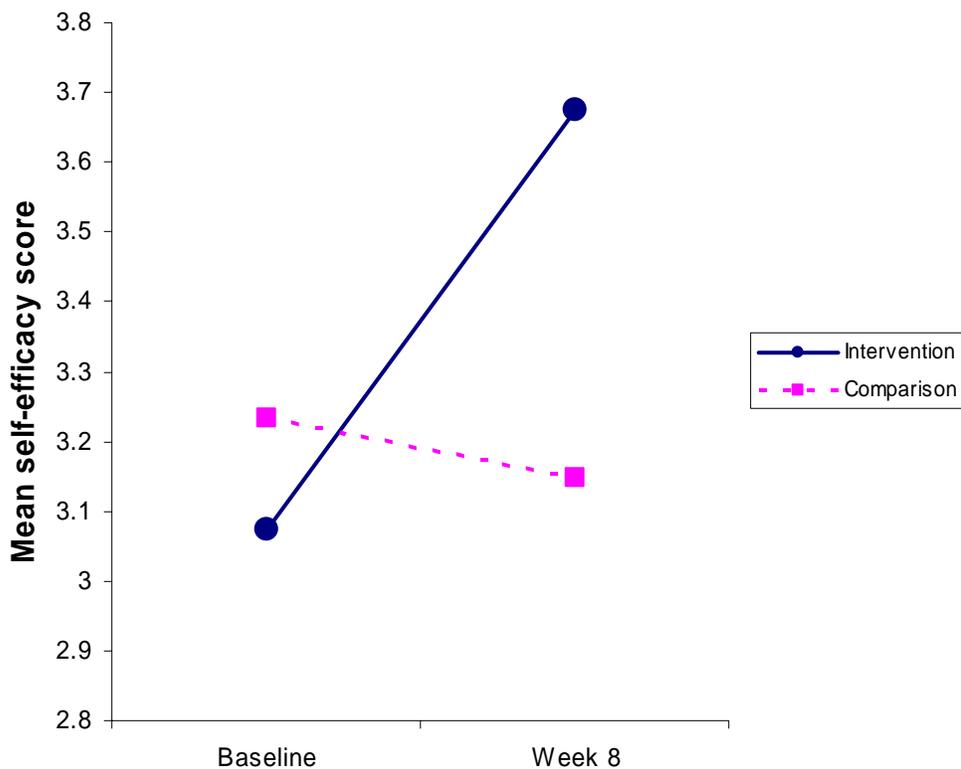
Mean time spent in combined moderate and vigorous physical activity (MVPA) at baseline and week 8 for the intervention and comparison groups are presented in Figure 2. Results of the MANOVA predicting time spent in MVPA showed a significant interaction between intervention group and time, suggesting that the difference between baseline and week 8 scores varied across the two groups (Wilks = .89,  $F(1, 44) = 5.52$ ,  $p=.023$ ). Follow-up paired t-tests showed that for intervention group only, time spent in MVPA per week was significantly higher at week 8 compared to baseline (intervention: mean change .62 hrs/week, SD 1.22;  $t(18) = 2.21$ ,  $p=.040$ ; comparison: mean change .01 hrs/week, SD .59;  $t(28) = .44$ ,  $p=.920$ ).



**Figure 2:** Total time (hrs/wk) spent in combined moderate and vigorous physical activity at baseline and week 8, by group

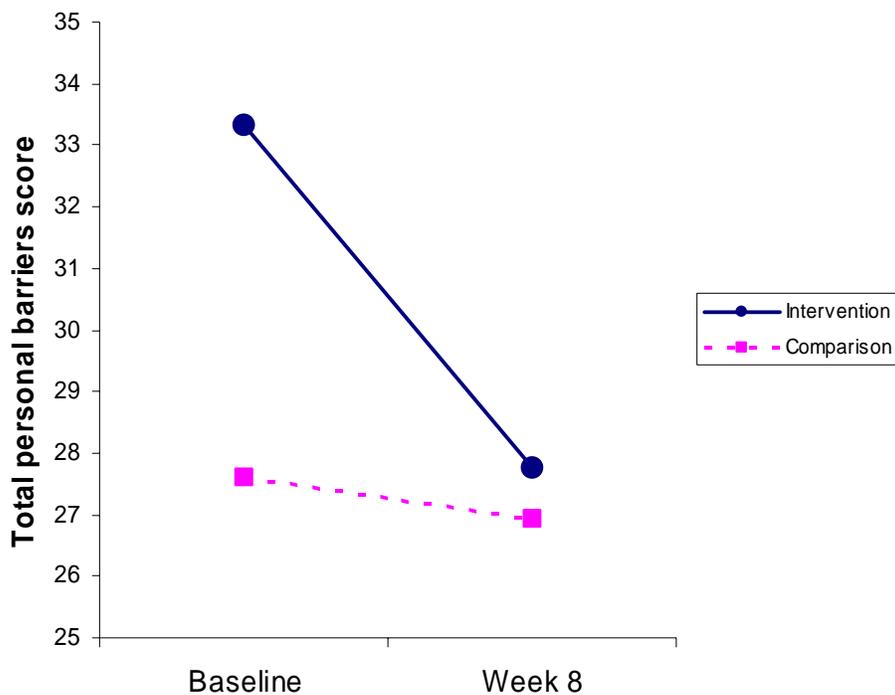
### 3.3 Self-efficacy, social support and personal barriers

Mean walking self-efficacy scores at baseline and week 8 for the intervention and comparison groups are presented in Figure 3. Results of the MANOVA showed a significant interaction between intervention group and time (Wilks = .81,  $F(1, 47) = 11.40$ ,  $p=.001$ ). Paired t-tests showed that self-efficacy was significantly higher at week 8 compared to baseline for the intervention group (mean change .60, SD .70;  $t(18) = 3.72$ ,  $p=.002$ ) but not for the comparison group (mean change  $-.09$ , SD .69;  $t(29) = .69$ ,  $p=.496$ ).



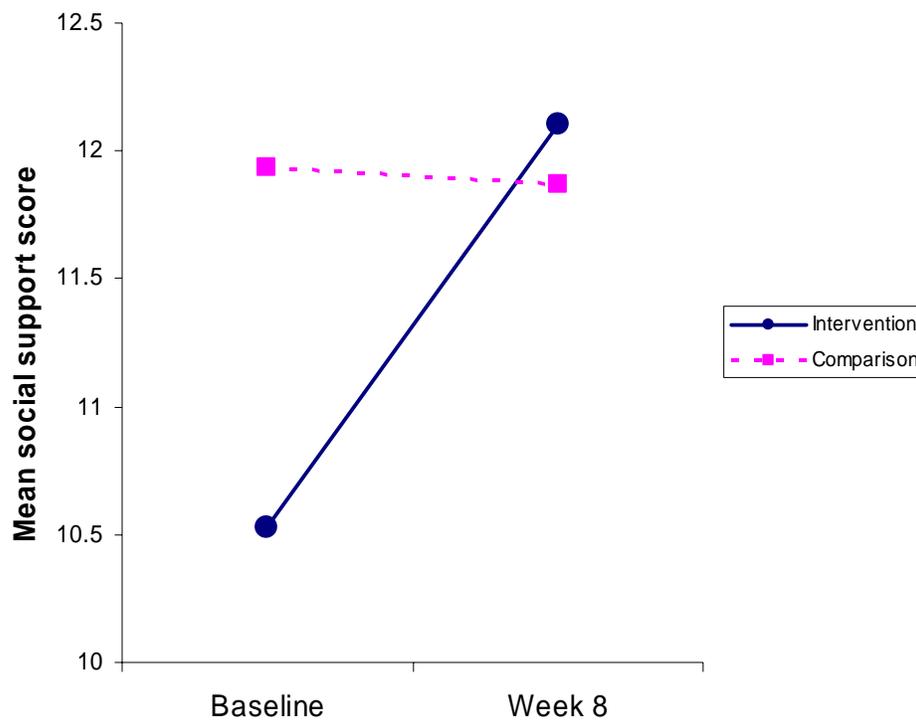
**Figure 3:** Mean walking self-efficacy scores at baseline and week 8, by group

The total number of personal barriers at baseline and week 8 for the intervention and comparison groups are presented in Figure 4. Results of the MANCOVA controlling for baseline BMI (since it was associated with personal barriers), showed a significant interaction between intervention group and time (Wilks = .82,  $F(1, 41) = 9.17$ ,  $p=.004$ ). Paired t-tests showed that for intervention group only, personal barriers were significantly lower at week 8 compared to baseline (intervention: mean change -5.72, SD 6.01;  $t(17) = 4.04$ ,  $p=.001$ ; comparison: mean change -.82, SD 2.98;  $t(27) = 1.46$ ,  $p=.156$ ).



**Figure 4:** Total number of personal barriers to physical activity scores at baseline and week 8, by group

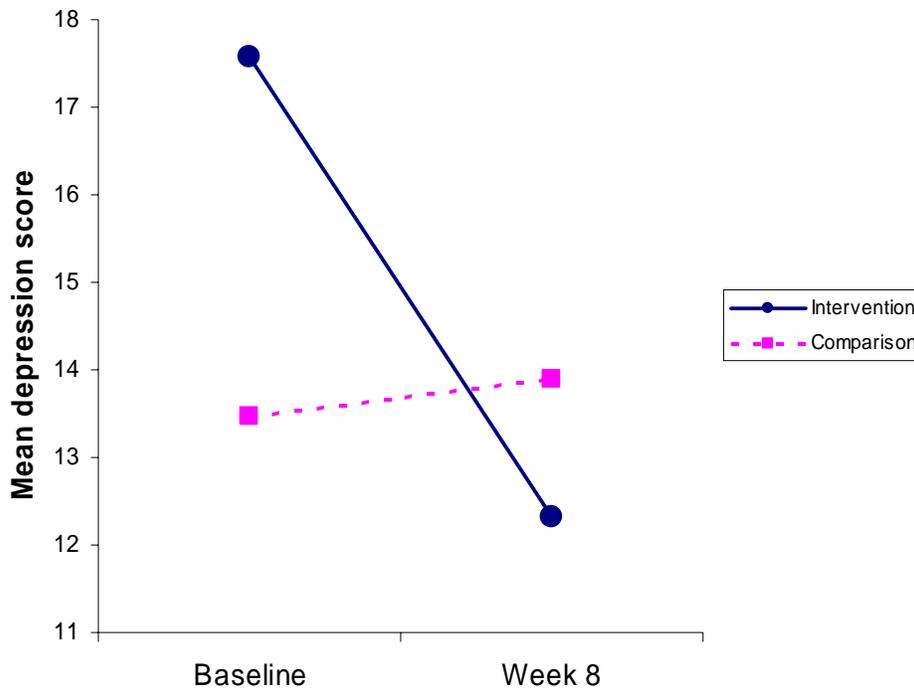
Mean social support from family and friends scores at baseline and week 8 for the intervention and comparison groups are presented in Figure 5. Results of the MANOVA showed a significant interaction between intervention group and time (Wilks = .84,  $F(1, 47) = 9.11$ ,  $p=.004$ ). Paired t-tests showed that social support for physical activity was significantly higher at week 8 compared to baseline for the intervention (mean change 1.58, SD 1.90;  $t(18) = 3.63$ ,  $p=.002$ ) but not for the comparison group (mean change -.07, SD 1.84;  $t(29) = .20$ ,  $p=.844$ ).



**Figure 5:** Mean family and friends' social support for physical activity scores at baseline and week 8, by group

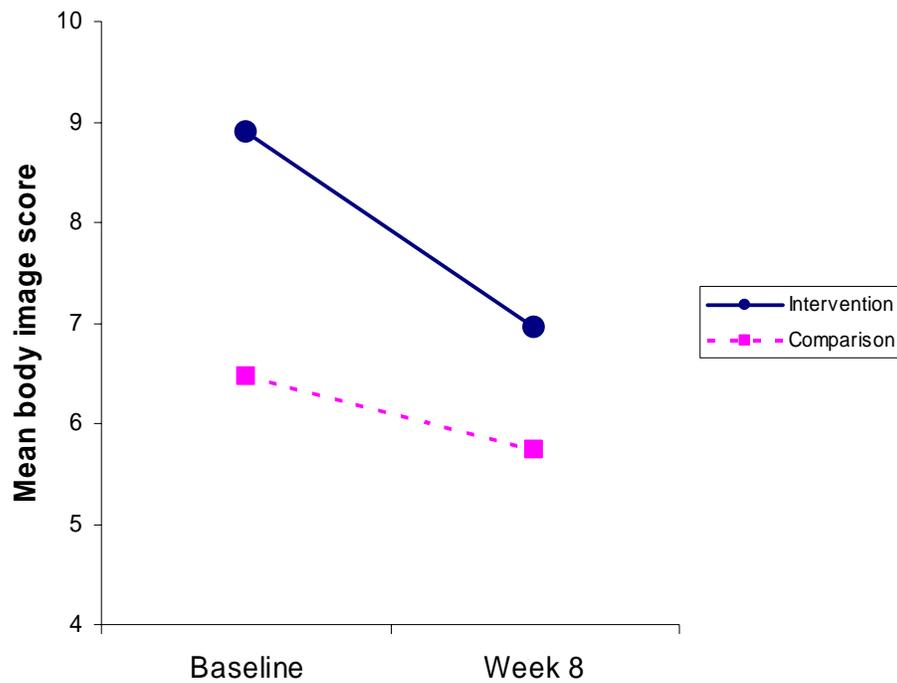
### 3.4 Mental health

Mean depression scores at baseline and week 8 for the intervention and comparison groups are presented in Figure 6. There was a significant interaction between intervention group and time (Wilks = .90,  $F(1, 47) = 5.07$ ,  $p=.029$ ). Follow-up paired t-tests showed that for intervention group only, depression symptoms were significantly lower at week 8 compared to baseline (intervention: mean change -5.26, SD 9.65;  $t(18) = 2.38$ ,  $p=.029$ ; comparison: mean change .43, SD 7.93;  $t(29) = .30$ ,  $p=.767$ ).



**Figure 6:** Mean depression scores at baseline and week 8, by group

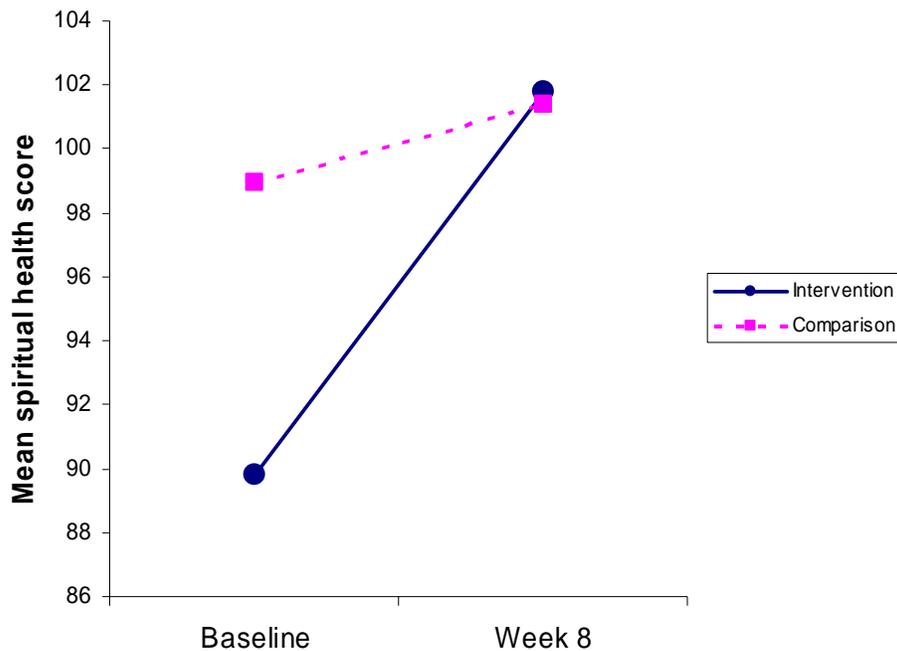
Mean body image scores at baseline and week 8 for the intervention and comparison groups are presented in Figure 7. Results of the MANCOVA controlling for baseline BMI (since it was associated with body image), failed to show a significant interaction between intervention group and time (Wilks = .97,  $F(1, 44) = 1.16$ ,  $p=.288$ ). Although the intervention group shows a trend in the expected direction (figure 7) between group differences in change in body image did not reach statistical significance.



**Figure 7:** Mean body image scores at baseline and week 8, by group

### 3.5 Spiritual health

Mean spiritual health scores at baseline and week 8 for the intervention and comparison groups are presented in Figure 8. Results of the MANCOVA controlling for baseline BMI (since it was associated with spiritual health), showed a significant interaction between intervention group and time (Wilks = .85,  $F(1, 43) = 7.41$ ,  $p=.009$ ). Paired t-tests showed that for intervention group only, spiritual health was significantly higher at week 8 compared to baseline (intervention: mean change 12.22, SD 14.27;  $t(17) = 3.64$ ,  $p=.002$ ; comparison: mean change 2.40, SD 6.68;  $t(29) = 1.97$ ,  $p=.059$ ).



**Figure 8:** Mean spiritual health scores at baseline and week 8, by group

## CHAPTER 4

### DISCUSSION

This study aimed to evaluate the effectiveness of a mind, body and spiritually-based health promotion program in increasing physical activity, as well as physical activity self-efficacy, social support, decreasing perceived barriers to physical activity, and improving mental and spiritual health in women. Results suggest that the intervention was effective in significantly increasing physical activity levels as assessed by the two different measures: total walking duration, and total time spent in moderate and vigorous physical activity, compared to the comparison group. This suggests the effectiveness of the holistic approach in bringing about at least short-term changes in physical activity behaviour. The intervention group reported increasing their walking time by an average of half an hour per week, and increasing their time spent in moderate and vigorous physical activity by .63 hours per week (although it should be noted that these two increases share some overlap in that the variables walking uphill and brisk walking were included in both scores).

The effectiveness of a holistic approach to promoting physical activity within a church-based setting has not been previously tested in Australia. The present findings are consistent with the limited research available in African-American samples in the US that suggested the effectiveness of church-based health promotion for promoting other health behaviours (eg. increase in fruit and vegetable intake: Campbell et al. 1999; Resnicow et al. 2001). The increases in physical activity in the present study indicate a potential for church-based settings to be an effective location for women in the community to become more active. Follow-up data are needed to determine maintenance of walking and overall physical activity in the long term.

Aspects of the social cognitive theory that were assessed - walking self-efficacy, social support of family and friends to be physically active, and personal barriers to physical activity - were significantly improved in the intervention group when compared to the comparison group. Increases in self-efficacy have been shown to be an indication of

future behaviour change for up to two years (Sallis et al. 1992). Previous research has suggested that self-efficacy and social support are important mediators of changes in physical activity among adults (King, Haskell, Barr-Taylor, Kraemer et al. 1991; Marcus, Bock, Pinto, Forsyth et al. 1998). Improvements in these mediators suggest potential for longer term maintenance of physical activity behaviour change post-program, which is a positive outcome given the present results.

A significant decrease in personal barriers to physical activity was shown in the intervention group. This may be due to the focus on individual barriers in the support group component of the program, greater knowledge of potential benefits from the educational component, or the practice of participating in the physical activity component each session (despite the weather!). These findings are consistent with the literature on promoting moderate physical activity rather than vigorous as a method of lowering perceived barriers (Dishman 1994). The social support and relationships developed with other intervention group participants may also have contributed to the observed decrease in perceived personal barriers. As the results indicated, perceived social support over the 8 weeks of the program significantly increased in the intervention group. This may have included support from additional friends made whilst part of the intervention, as well as family encouragement and participation. This positive relationship between increased social support and physical activity is also consistent with the literature (Duncan et al. 1993; Sallis et al. 1999).

Cognitive changes are important processes of health behaviour change (Matarazzo, Weiss and Herd 1984). These preliminary results show potential for effective cognitive and physical activity behaviour change in women in a church-based setting. Due to the small number of participants in the present study, we did not have the power to analyse statistically whether increase in walking or moderate-vigorous physical activity were mediated by increases in self-efficacy/social support and decreases in personal barriers. However, these findings are consistent with that hypothesis, and this could be tested in future studies with larger samples.

Positive effects of the intervention on mental health were also shown in the present study. Symptoms of depression decreased significantly within the intervention group relative to the control group. This is somewhat consistent with the known benefits of physical activity (USDHHS 1996), although may be an effect of improvements in other health areas. Having increased social support, encouragement and individual goal achievement and counselling in the support group component of the program may have contributed to improvements in mental health. The difference between the intervention and comparison groups was somewhat surprising considering the comparison group were undertaking steps to more positive relationship building and also were exposed to the same amount of time in a support group as part of their program. Baseline comparisons found no differences in mental health between groups. The experiential physical activity component of the intervention combined with the holistic approach may have contributed to the improvements in mental health among women in the intervention group. It should also be noted that in the intervention group the three “non-completers” had among the highest mean scores for depression. This may have implications for future physical activity promotion in women, since it may suggest that those experiencing depressive symptoms may be unable to undertake other health behaviour changes. Alternatively, the inclusion of moderate physical activity prescription in the treatment of those with moderate depressive symptoms may be beneficial, as the findings from this study suggest that the benefit of a support group and education seems to be helped somewhat by adding the physical activity component. Further research into exploring this notion is needed.

Body image was also assessed in the present study. There were no differences found between groups of changes in body image over the intervention period. Research has shown greater improvements in body image in women after participating in a 12-week weight lifting intervention, than among women participating in a 12-week walking intervention (Tucker and Mortell 1993; Ahmed, Hilton and Pituch 2002). Despite the trend of improvement in body image scores in the present study, the effects appear less clear. These findings may indicate that one program session focused on body image may not be sufficient to improve body image; that the study may have been under-

powered to detect differences between groups; that eight weeks may not be long enough to have an effect on body image; or that weight training as opposed to aerobic physical activity may be more effective in promoting positive body image. Further investigation is needed to better understand the impact of a holistic program on women's body image.

The connection between spirituality or religious practices and reduced risk of all-cause mortality has been well documented (Mullen 1990; Powell et al. 2003; Seeman et al. 2003), but a relationship between physical activity and spiritual health has not been previously researched. In the present study, spiritual health scores in the intervention group also significantly improved compared to the comparison group. This finding was unexpected as the comparison group had a similar spiritual component in their program. This has important implications for holistic health, and effectiveness of future health promotion programs. It may be that a program including multiple aspects of health, mind, body and spirit produces additional benefits to spiritual health beyond those of a spiritual component alone, without a physical health focus. It is difficult to separate program components and attribute the positive effects to any one particular aspect of the program, as all occurred simultaneously. Further research that assesses separate components of the program could help to determine those aspects most important in promoting increased physical activity and improved mental and spiritual health.

This program focused on self-selected women volunteers, and hence caution should be exercised in generalising these findings to the wider population. In addition, the longer-term maintenance of these lifestyle behaviour changes has not yet been determined. As the present study did not randomise participants into the intervention or comparison groups, there may have been important differences between groups (eg. health status) that were not assessed and that confounded the study findings. Randomisation may have reduced some of the confounding effects of differences between groups (eg. baseline BMI). The study was also limited by the small number of women. All the measures in the present study were self-reported, and hence subject to response biases. A more objective measure of physical activity (eg. pedometers or

accelerometers) could be incorporated to complement the self-reported measures in future research.

The results of this pilot program suggest that a church-based holistic health program designed specifically to target adult women shows much potential as an approach to promoting physical activity and spiritual and mental health among women in Australia. The positive effects on physical, mental and spiritual health evident in the present study could, if achieved across larger segments of the population, play an important role in decreasing the burden of a variety of chronic lifestyle diseases, and improving the health of Australian women. A wider dissemination of the program and co-operation with local and state governing bodies to fund and empower local churches to run similar programs could facilitate the translation of the program to real-world settings. A combined effort on all levels as part of a federal or state initiative could warrant further success. Further comprehensive evaluation of the present study across different populations and over longer time frames is recommended.

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# DEAKIN UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE PLAIN LANGUAGE STATEMENT

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Thank you for enrolling in the Careforce Life Keys 10-session 8-week women's health program "Embracing a Healthy Lifestyle". As an attendee of the program, I would like to invite you to participate in a research study that looks at evaluating the effectiveness of this program. My name is Michelle Jorna and I am completing a Master of Public Health in the School of Exercise and Nutrition Sciences at Deakin University. The course involves a research project and thesis. This research is under the supervision of Dr Kylie Ball and Dr Jo Salmon, both Research Fellows in the School of Exercise and Nutrition Sciences.

This study aims to test the effectiveness of a mind, body and spiritually based health promotion program in women, specifically to examine the effects of the program on 4 key outcomes: physical activity, fruit and vegetable intake, body image, and depressive symptoms over a 10-week period. The second aim of the study is to test how well we can measure physical activity with a questionnaire compared to a motion sensor. If you agree to being involved in this study you will be asked to complete questionnaires at the beginning, end and 1 month after the end of the study about how you feel about your physical, mental and spiritual health. These questionnaires will take approximately 20min on each of the three occasions, and will include questions like "In the last four weeks, how many serves of fruit did you usually eat each day?" and "Which of the following statements best describes how physically active you have been during the past 4 weeks?". In addition you will be asked to wear a motion sensor for one period of 7 days at the beginning or at the end of the study. The motion sensor is designed to provide estimates of your daily activity, is only the size of a matchbox and is worn at the hip over or under your clothes. It will not interfere with your normal daily routine and is not noticeable when worn under clothing. These measurements will allow us to see how effective the program has been in helping you to increase your level of activity.

**Participating in the health program does not mean you must take part in this research.** Please be assured that all information you provide will remain completely confidential. Questionnaires will be identified only by a number. All information will be used for the purpose of this research only, and it will be held in confidence and stored in a locked cabinet for a period of six years at Deakin University. This is an important research study, but you are under no obligation to participate. If you do agree to participate you are free to withdraw at any time during the study in which event your participation in the research study will immediately cease and any information obtained from you will not be used. If you have any further questions regarding the questionnaires or motion sensors used in the study, please contact supervisor Dr Kylie Ball telephone 03 9251 7310 or Dr Jo Salmon telephone 03 9251 7254; between 9am and 4pm weekdays.

Following the completion of the study, group findings will be made available to participants via a newsletter. Your participation is important to us, and will add to our knowledge of how we can help people start and maintain a healthy lifestyle.

Thank you,

Michelle Jorna  
Researcher  
School of Exercise and Nutrition Sciences

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Should you have any concerns about the conduct of this research project, please contact the Chair, Dr Mark Stokes, Deakin University Human Research Ethics Subcommittee – Health and Behavioural Sciences. Telephone 9244 6865.

# DEAKIN UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE PLAIN LANGUAGE STATEMENT

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Thank you for enrolling in a Careforce Life Keys 10-session 8-week program. As a female attendee of the program, I would like to invite you to participate in a research study that looks at the effectiveness of another Careforce Life Keys program, “Embracing a Healthy Lifestyle”. We would like to invite you to be part of the **comparison group** for this program. My name is Michelle Jorna and I am completing a Master of Public Health in the School of Exercise and Nutrition Sciences at Deakin University. The course involves a research project and thesis. This research is under the supervision of Dr Kylie Ball and Dr Jo Salmon, both Research Fellows in the School of Exercise and Nutrition Sciences.

This research study aims to test the effectiveness of the ‘Embracing a Healthy Lifestyle’ program, a mind, body and spiritually based health promotion program in women, specifically to examine the effects of the program on 4 key outcomes: physical activity, fruit and vegetable intake, body image, and depressive symptoms over a 10-week period. The second aim of the study is to test how well we can measure physical activity with a questionnaire compared to a motion sensor. If you agree to being involved in this study you will be asked to complete a survey at the beginning, end and 1 month after the end of the program about how you feel about your physical, mental and spiritual health. This survey will take approximately 20min on each of the three occasions, and will include questions like “In the last four weeks, how many serves of fruit did you usually eat each day?” and “Which of the following statements best describes how physically active you have been during the past 4 weeks?”. In addition, you will be asked to wear a motion sensor for one period of 7 days at the beginning or end of the study. The motion sensor is designed to provide estimates of your daily activity, is only the size of a matchbox and is worn at the hip over or under your clothes. It will not interfere with your normal daily routine and is not noticeable when worn under clothing. We will compare all these measures between participants in the Healthy Lifestyle program, and participants in the comparison group. This will tell us whether a health program is more effective than a relationship program for increasing physical activity and improving other health outcomes. **Participating in the Careforce Life Keys program you are enrolled in does not mean you must take part in this research.**

Please be assured that all information you provide will remain completely confidential. Questionnaires will be identified only by a number. All information will be used for the purpose of this research only, and it will be held in confidence and stored in a locked cabinet for a period of six years at Deakin University. This is an important research study, but you are under no obligation to participate. If you do agree to participate you are free to withdraw at any time during the study in which event your participation in the research study will immediately cease and any information obtained from you will not be used. If you have any further questions regarding the questionnaires or motion sensors used in the study, please contact supervisor Dr Kylie Ball telephone 03 9251 7310 or Dr Jo Salmon telephone 03 9251 7254; between 9am and 4pm weekdays.

Following the completion of the study, group findings will be made available to participants via a newsletter. You will also receive feedback on your personal activity levels collected from the 7 day period of motion sensor data, along with a small gift as a token of our appreciation. Your participation is important to us, and will add to our knowledge of how we can help woman start and maintain a healthy lifestyle.

Thank you,

Michelle Jorna  
Researcher  
School of Exercise and Nutrition Sciences

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Should you have any concerns about the conduct of this research project, please contact the Chair, Dr Mark Stokes, Deakin University Human Research Ethics Subcommittee – Health and Behavioural Sciences. Telephone 9244 6865.

DEAKIN UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE  
CONSENT FORM: SURVEYS, QUESTIONNAIRES



I, \_\_\_\_\_ of \_\_\_\_\_  
(Please print name clearly) (Home address)

**hereby consent** to be a subject of a human research study to be undertaken by Michelle Jorna and I understand that the purpose of the research is to:

1. Evaluate the effectiveness of a mind, body and spiritually based health promotion program in women aged 18-70, specifically to examine the effects of the program on 4 key outcomes: physical activity, fruit and vegetable intake, body image, and depressive symptoms. Attitudes towards spiritual health will also be assessed.
2. To test the validity of the CHAMPS physical activity questionnaire using motion sensor data.

**I acknowledge that:**

1. Upon receipt, my questionnaire will be coded and my name and address kept separately from it.
2. Any information that I provide will not be made public in any form(s) that could reveal my identity to an outside party i.e. that I will remain fully anonymous.
3. I understand that aggregated results **will** be used for research purposes and may be reported in scientific and academic journals.
4. Individual results **will not** be released to any person except at my request and on my authorisation.
5. I am free to withdraw my consent at any time during the study in which event my participation in the research study will immediately cease and any information obtained from me will not be used.

**Signature:** \_\_\_\_\_

**Date:** \_\_\_ / \_\_\_ / 2004

Appendix 4
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# Women's Health Survey

**This survey is about your physical, mental and spiritual health. If possible please answer all questions. When you have finished, please return the survey to your small group Careforce Lifekeys Facilitator.**

## How to complete this survey

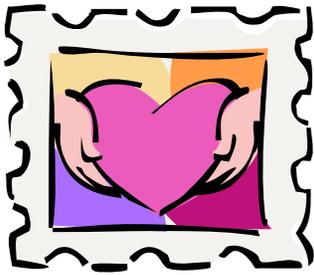
To answer each question, please tick the circle closest to your answer. For example:

	Yes	No
Do you smoke cigarettes?	<input checked="" type="radio"/>	<input type="radio"/>

You would tick "yes" if you smoked cigarettes. In some questions, more than one answer may be needed. For these questions, please tick all the circles closest to your answer.

If you are unsure about how to answer a question, please shade the circle closest to your answer. There are no right or wrong answers. We just want your opinion.

If you need any help to answer any questions, please ask your facilitator.



## Women's Health Survey

Q1. How confident are you that you could walk for exercise or recreation, in each of the following situations? *(Please tick one on each line).*

	Not at all confident <sub>1</sub>	Slightly confident <sub>2</sub>	Moderately confident <sub>3</sub>	Very confident <sub>4</sub>	Extremely confident <sub>5</sub>
a Go for a walk even when I am tired	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b Go for a walk even when I am in a bad mood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c Go for a walk even when I feel I don't have time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d Go for a walk even when I am on vacation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e Go for a walk even when it is raining	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2. How confident are you that you could do vigorous physical activities such as jogging, swimming, cycling, aerobics, competitive sports, or any other activity that makes you puff and pant, in the following situations? *(Please tick one on each line).*

	Not at all confident <sub>1</sub>	Slightly confident <sub>2</sub>	Moderately confident <sub>3</sub>	Very confident <sub>4</sub>	Extremely confident <sub>5</sub>
a Do vigorous physical activity even when I am tired	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b Do vigorous physical activity even when I am in a bad mood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c Do vigorous physical activity even when I feel I don't have time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d Do vigorous physical activity even when I am on vacation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e Do vigorous physical activity even when it is raining	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q3. During the **past year**, how often did members of your **family** (including partner/spouse): *(Please tick one on each line)*

	Never <sub>1</sub>	Rarely <sub>2</sub>	A few times <sub>3</sub>	Often <sub>4</sub>	Very often <sub>5</sub>
a Do physical activity with you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b Encourage you to be physically active?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4. During the **past year**, how often did **friends or work colleagues**: *(Please tick one on each line)*

	Never <sub>1</sub>	Rarely <sub>2</sub>	A few times <sub>3</sub>	Often <sub>4</sub>	Very often <sub>5</sub>
a Do physical activity with you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b Encourage you to be physically active?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q5. How often do each of the following things interfere with or prevent you from exercising or being physically active? *(Please tick one circle on each line)*.

	Never <sub>1</sub>	Rarely <sub>2</sub>	Sometimes <sub>3</sub>	Fairly often <sub>4</sub>	Very often <sub>5</sub>	Not applicable <sub>6</sub>
a No one to exercise with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
b Self-conscious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
c Feel too overweight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
d No safe place	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
e No facilities/equipment in my local neighbourhood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
f No facilities/equipment at my workplace	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g Lack of skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
h Lack of knowledge on how to exercise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
i No childcare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j Not in good health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
k No energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
l Get enough exercise at my job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m No motivation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
n No self-discipline	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
o Not organised enough	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
p Do not like exercise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
q Do not have time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Q6. Below is a list of ways you might have felt or behaved. For each statement, please tick one circle on each line that indicates how often you have felt this way **during the past week**.

	Rarely or None of the Time (Less than 1 Day) <sup>1</sup>	Some or Little of the Time (1-2 Days) <sup>2</sup>	Occasionally or a Moderate Amount of the Time (3-4 Days) <sup>3</sup>	Most or All of the Time (5-7 Days) <sup>4</sup>
a I was bothered by things that usually don't bother me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b I did not feel like eating; my appetite was poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c I felt that I could not shake off the blues even with help from my family or friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d I felt that I was just as good as other people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e I had trouble keeping my mind on what I was doing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f I felt depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g I felt that everything I did was an effort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h I felt hopeful about the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i I thought my life had been a failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j I felt fearful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k My sleep was restless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l I was happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m I talked less than usual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n I felt lonely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o People were unfriendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p I enjoyed life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q I had crying spells	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r I felt sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s I felt that people disliked me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
t I could not get "going"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*If you feel you have an issue with any of the above statements and would like some help to deal with this, please consider contacting one of the following:*

*\*Your general practitioner for advice about who would be the best person in your community for you to talk to*

*\* Your local Community Health Centre or Women's Health Centre*

*\*A Careforce Church counsellor on 9736 2323 (local call)*

*\*A Life Line counsellor on 13 11 14*

Q7. In the **last 4 weeks**, how dissatisfied have you felt about:  
(Please tick one on each line)

	Not at all <b>0</b>	<b>1</b>	Slightly <b>2</b>	<b>3</b>	Moderately <b>4</b>	<b>5</b>	Markedly <b>6</b>
a Your weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b Your shape	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8. In the **last 4 weeks**, how many serves of fruit or 100% fruit juice did you usually eat each day? (a 'serve' of fruit = 1 medium piece, 2 small pieces of fruit or 200ml of orange juice) (Please tick one circle only)

I serve or less  O<sub>1</sub>

2-3 serves  O<sub>2</sub>

4-5 serves  O<sub>3</sub>

6 serves or more  O<sub>4</sub>

Didn't eat fruit  O<sub>5</sub>

Q9. In the **last 4 weeks**, how many serves of vegetables did you usually eat each day? (a 'serve' = ½ cup cooked vegetables or 1 cup of salad vegetables) (Please tick one circle only)

I serve or less  O<sub>1</sub>

2-3 serves  O<sub>2</sub>

4-5 serves  O<sub>3</sub>

6 serves or more  O<sub>4</sub>

Didn't eat vegetables  O<sub>5</sub>

Q10. In the **last 4 weeks**, how many glasses of each of the following drinks did you usually have each day? (1 glass = 250 mls) (Please tick one on each line)

	<b>0 Glasses</b>	<b>1 Glass</b>	<b>2-3 Glasses</b>	<b>4-5 Glasses</b>	<b>6-8 Glasses</b>	<b>8 + Glasses</b>
a Water (plain)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b Juice (100%)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c Soft drink - Diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d Soft drink - Regular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e Milk - Reduced fat/Skim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f Milk - Full cream	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11. For each of the following statements please tick one circle on each line that indicates the extent of your agreement or disagreement as it describes your personal experience.

	Strongly Agree <sup>6</sup>	Moderately Agree <sup>5</sup>	Agree <sup>4</sup>	Disagree <sup>3</sup>	Moderately Disagree <sup>2</sup>	Strongly Disagree <sup>1</sup>
a I don't find much satisfaction in private prayer with God	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b I don't know who I am, where I came from or where I am going	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c I believe that God loves me and cares about me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d I feel that life is a positive experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e I believe that God is impersonal and not interested in my daily situations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f I feel unsettled about my future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g I have a personally meaningful relationship with God	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h I feel very fulfilled and satisfied with life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i I don't get much personal strength and support from my God	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j I feel a sense of well-being about the direction my life is headed in	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k I believe that God is concerned about my problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l I don't enjoy much about life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m I don't have a personally satisfying relationship with God	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n I feel good about my future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o My relationship with God helps me not to feel lonely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p I feel that life is full of conflict and unhappiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q I feel most fulfilled when I'm in close communion with God	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r Life doesn't have much meaning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s My relationship with God contributes to my sense of well-being	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
t I believe there is some real purpose for my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12. What is your highest level of schooling? *(Please tick one circle only)*

Never attended school  O<sub>1</sub>

Primary school  O<sub>2</sub>

Some high school  O<sub>3</sub>

High school  O<sub>4</sub>

Technical or trade certificate  O<sub>5</sub>

University or tertiary qualifications  O<sub>6</sub>

Q13. Are you: *(Please tick one circle only)*

Married  O<sub>1</sub>

De Facto  O<sub>2</sub>

Separated  O<sub>3</sub>

Divorced  O<sub>4</sub>

Widowed  O<sub>5</sub>

Never Married  O<sub>6</sub>

Q14. Do you currently own a pedometer (step counter device) that you use?  
*(Please tick one circle only)*

Yes  O<sub>1</sub>

No  O<sub>2</sub>

Q15. What is your current age? \_\_\_\_\_

Q16. What is your date of birth? Day   Month   Year

Q17. How much do you weigh (no clothes or shoes)?

kg **OR**   st    lb

Q18. How tall are you without shoes?

cm **OR**   feet   inches

# CHAMPS Activities Questionnaire

Developed by  
Institute for Health and Aging  
University of California San Francisco (UCSF)  
Stanford Center for Research in Disease Prevention  
Stanford University

**Instructions:** We are interested in finding out about the kinds of activities you do as part of your everyday life. You will be asked about activities you do at work, to get from place to place, as part of your house and yard work, and in your spare time for recreation, exercise or sport.

1. Which of the following statements best describes how active you have been during the past 4 weeks, that is, had hobbies, work, social activities, or other activities that kept you busy? (*Please tick one circle only*)

Not at all active  O<sub>1</sub>

A little active  O<sub>2</sub>

Fairly active  O<sub>3</sub>

Quite active  O<sub>4</sub>

Very active  O<sub>5</sub>

Extremely active  O<sub>6</sub>

2. Which of the following statements best describes how physically active you have been during the past 4 weeks, that is, done activities such as brisk walking, swimming, dancing, general conditioning, or recreational sports? (*Please tick one circle only*)

Not at all active  O<sub>1</sub>

A little active  O<sub>2</sub>

Fairly active  O<sub>3</sub>

Quite active  O<sub>4</sub>

Very active  O<sub>5</sub>

Extremely active  O<sub>6</sub>

3. During the past 4 weeks, about how many flights of stairs did you climb during a typical day? (one flight = 12-15 steps, equivalent to going from one floor to another) (*Please tick one circle only*)

None  O<sub>1</sub>

Less than one  O<sub>2</sub>

1-2 flights  O<sub>3</sub>

3-4 flights  O<sub>4</sub>

5 or more flights  O<sub>5</sub>

## Instructions: Read Carefully

1. Think about the past 4 weeks. The next few pages list various activities you might have done. Before you begin, please review the following steps and examples:

### Step #1: Number of times each week

- For each activity, write on the line provided how many times each week, on average, you did that activity.
- If you did an activity less than once a week or not at all, please write "0" on the line provided

For example, if you did not do the activity at all or did it less than once a week during the past 4 weeks (**see Example A**)

#### Example A Step #1

<u>Activities</u>	<b>Number of times a week</b> (If none, write "0")	Less than 1 hr/wk	1-2½ hrs/wk	3-4½ hrs/wk	5-6½ hrs/wk	7-8½ hrs/wk	9 or more hrs/wk
Mow lawns	Times a week <u>0</u> →	A	B	C	D	E	F

### Step #2: Total time, on average, each week

- If you did the activity at least once a week, circle one letter representing how much total time, on average, you spent doing it each week (**see Example B**)

For example, if you did the activity on average 3 times a week for a total of 1½ hours:

#### Example B Step #1

<u>Activities</u>	<b>Number of times a week</b> (If none, write "0")	Less than 1 hr/wk	1-2½ hrs/wk	3-4½ hrs/wk	5-6½ hrs/wk	7-8½ hrs/wk	9 or more hrs/wk
Use computer	Times a week <u>3</u> →	A	ⓑ	C	D	E	F

Think about the past 4 weeks. For each activity, please write **HOW MANY TIMES** each week, on average you did it. Next, please circle one letter representing how much **TOTAL TIME**, on average, you spent doing that activity each week.

<b><u>Social Activities:</u></b>	Number of times a week (If none, write "0")	Less than 1 hr a week	1-2½ hrs a week	3-4½ hrs a week	5-6½ hrs a week	7-8½ hrs a week	9 or more hrs a week
		1	2	3	4	5	6
a. Visit with friend or family (other than those you live with)	Times a week ____ →	A	B	C	D	E	F
b. Go to the seniors club or community centre etc.....	Times a week ____ →	A	B	C	D	E	F
c. Do volunteer work .....	Times a week ____ →	A	B	C	D	E	F
d. Attend church or take part in church activities .....	Times a week ____ →	A	B	C	D	E	F
e. Attend other club or group meetings	Times a week ____ →	A	B	C	D	E	F
f. Talk on the phone (when not at work)	Times a week ____ →	A	B	C	D	E	F

Think about the past 4 weeks. For each activity, please write **HOW MANY TIMES** each week, on average you did it. Next, please circle one letter representing how much **TOTAL TIME**, on average, you spent doing that activity each week.

<b><i>Recreation and Hobbies:</i></b>	Number of times a week (If none, write "0")	Less than 1	1-2½ hrs	3-4½ hrs	5-6½ hrs	7-8½ hrs	9 or more
		hr a week 1	a week 2	a week 3	a week 4	a week 5	hrs a week 6
g. Use a computer ( <u>not</u> work related).....	Times a week ____ →	A	B	C	D	E	F
h. Dance (such as square, folk, line, ballroom) (do not count aerobic dance here) .....	Times a week ____ →	A	B	C	D	E	F
i. Do woodwork, needlework, drawing, or other arts or crafts .....	Times a week ____ →	A	B	C	D	E	F
j. Play golf, riding a cart (count walking time only) .....	Times a week ____ →	A	B	C	D	E	F
k. Play golf, carrying or pulling your equipment (count walking time only)	Times a week ____ →	A	B	C	D	E	F
l. Attend a concert, movie, lecture, or sporting event .....	Times a week ____ →	A	B	C	D	E	F
m. Play cards, bingo, or board games with other people .....	Times a week ____ →	A	B	C	D	E	F

Think about the past 4 weeks. For each activity, please write **HOW MANY TIMES** each week, on average you did it. Next, please circle one letter representing how much **TOTAL TIME**, on average, you spent doing that activity each week.

Recreation and Hobbies:	Number of times a week (If none, write "0")	Less than 1 hr a week	1-2½ hrs a week	3-4½ hrs a week	5-6½ hrs a week	7-8½ hrs a week	9 or more hrs a week
		1	2	3	4	5	6
n. Shoot pool or billiards .....	Times a week ____ →	A	B	C	D	E	F
o. Play tennis .....	Times a week ____ →	A	B	C	D	E	F
p. Play a musical instrument .....	Times a week ____ →	A	B	C	D	E	F
q. Read .....	Times a week ____ →	A	B	C	D	E	F

<b><u>Work Around the House:</u></b>	Number of times a week (If none, write "0")	Less than 1 hr a week	1-2½ hrs a week	3-4½ hrs a week	5-6½ hrs a week	7-8½ hrs a week	9 or more hrs a week
		1	2	3	4	5	6
r. Do heavy work around the house (such as washing windows, cleaning gutters)..	Times a week ____ →	A	B	C	D	E	F
s. Do light work around the house (such as sweeping or vacuuming).....	Times a week ____ →	A	B	C	D	E	F

Think about the past 4 weeks. For each activity, please write **HOW MANY TIMES** each week, on average you did it. Next, please circle one letter representing how much **TOTAL TIME**, on average, you spent doing that activity each week.

Work Around the House:	Number of times a week (If none, write "0")	Less than 1 hr a week 1	1-2½ hrs a week 2	3-4½ hrs a week 3	5-6½ hrs a week 4	7-8½ hrs a week 5	9 or more hrs a week 6
t. Do heavy gardening (such as digging in garden, raking).....	Times a week ____ →	A	B	C	D	E	F
u. Do light gardening (such as watering plants) .....	Times a week ____ →	A	B	C	D	E	F
v. Work on your car, truck, lawn mower, or other machinery .....	Times a week ____ →	A	B	C	D	E	F

<b><u>Walking and Jogging:</u></b>	Number of times a week (If none, write "0")	Less than 1 hr a week 1	1-2½ hrs a week 2	3-4½ hrs a week 3	5-6½ hrs a week 4	7-8½ hrs a week 5	9 or more hrs a week 6
w. Walk uphill or hike uphill (count only uphill part) .....	Times a week ____ →	A	B	C	D	E	F
x. Walk leisurely for exercise or pleasure .....	Times a week ____ →	A	B	C	D	E	F
z. Walk to do errands (such as to/from a shop) (count walk time only)	Times a week ____ →	A	B	C	D	E	F

Think about the past 4 weeks. For each activity, please write **HOW MANY TIMES** each week, on average you did it. Next, please circle one letter representing how much **TOTAL TIME**, on average, you spent doing that activity each week.

Walking and Jogging:	Number of times a week (If none, write "0")	Less than 1 hr a week 1	1-2½ hrs a week 2	3-4½ hrs a week 3	5-6½ hrs a week 4	7-8½ hrs a week 5	9 or more hrs a week 6
aa. Walk fast or briskly for exercise (do not count walking leisurely or uphill)	Times a week ____ →	A	B	C	D	E	F
bb. Jog or run	Times a week ____ →	A	B	C	D	E	F

<b><i>Other Types of Exercise:</i></b>	Number of times a week (If none, write "0")	Less than 1 hr a week 1	1-2½ hrs a week 2	3-4½ hrs a week 3	5-6½ hrs a week 4	7-8½ hrs a week 5	9 or more hrs a week 6
cc. Ride a bicycle or stationary cycle using legs only	Times a week ____ →	A	B	C	D	E	F
dd. Do aerobic machines involving arms and legs (such as rowing or cross-country ski machines)	Times a week ____ →	A	B	C	D	E	F
ee. Do stair or step machine	Times a week ____ →	A	B	C	D	E	F

Think about the past 4 weeks. For each activity, please write **HOW MANY TIMES** each week, on average you did it. Next, please circle one letter representing how much **TOTAL TIME**, on average, you spent doing that activity each week.

Other Types of Exercise:	Number of times a week (If none, write "0")	Less than 1 hr a week <small>1</small>	1-2½ hrs a week <small>2</small>	3-4½ hrs a week <small>3</small>	5-6½ hrs a week <small>4</small>	7-8½ hrs a week <small>5</small>	9 or more hrs a week <small>6</small>
ff. Swim gently	Times a week ____ →	A	B	C	D	E	F
gg. Swim moderately or fast	Times a week ____ →	A	B	C	D	E	F
hh. Do water exercises (do not count swimming)	Times a week ____ →	A	B	C	D	E	F
ii. Do stretching or flexibility exercises (do not count yoga or Tai-chi)	Times a week ____ →	A	B	C	D	E	F
jj. Do yoga or Tai-chi	Times a week ____ →	A	B	C	D	E	F
kk. Do aerobics or aerobic dancing	Times a week ____ →	A	B	C	D	E	F
ll. Do moderate to heavy strength training (such as hand held weights or more than 5 lbs, weight machines, or push ups)	Times a week ____ →	A	B	C	D	E	F

Think about the past 4 weeks. For each activity, please write **HOW MANY TIMES** each week, on average you did it. Next, please circle one letter representing how much **TOTAL TIME**, on average, you spent doing that activity each week.

Other Types of Exercise:	Number of times a week (If none, write "0")	Less than 1 hr a week 1	1-2½ hrs a week 2	3-4½ hrs a week 3	5-6½ hrs a week 4	7-8½ hrs a week 5	9 or more hrs a week 6
mm. Do light strength training (such as hand held weights of 5lbs or less or elastic bands)	Times a week ____ →	A	B	C	D	E	F
nn. Do light callisthenics or chair exercises (do not count strength training)	Times a week ____ →	A	B	C	D	E	F
oo. Play basketball, soccer, or racquetball/squash (do not count time on sidelines)	Times a week ____ →	A	B	C	D	E	F
pp. Do other types of physical activity not previously mentioned (please specify) _____	Times a week ____ →	A	B	C	D	E	F

**And finally... HAVE WE FORGOTTEN ANYTHING?** If there is anything else you would like to tell us about your physical activity, eating or health, please write this in the space below. For example, if your physical activity has been different to usual, you could tell us about that here.

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***Thank you for your time***