Jorna, Michelle, Ball, Kylie and Salmon, Jo 2006-10, Effects of a holistic health program on women's physical activity and mental and spiritual health, *Journal of science and medicine in sport*, vol. 9, no. 5, pp. 395-401.

**Copyright**: 2006, Sports Medicine Australia.
Effects of a holistic health program on women’s physical activity and mental and spiritual health

Michelle Jorna¹, Kylie Ball¹, Jo Salmon¹

¹: Centre for Physical Activity and Nutrition Research, School of Exercise and Nutrition Sciences, Deakin University, Melbourne, Australia

Submission Date: 19.12.05

Keywords: physical activity intervention, women, mental health

Corresponding Author:
Michelle Jorna
School of Exercise and Nutrition Sciences
Deakin University
221 Burwood Hwy
Burwood VIC 3125
AUSTRALIA
Fax: 03 9244 6017
Email: michelle.jorna@deakin.edu.au
ABSTRACT

Intervention studies aimed at promoting increased physical activity have been trialled in many different settings including primary care, worksites and the community. 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 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. Between-group differences over time were examined using one-way MANOVA’s. Physical activity was higher in the intervention group than the comparison group. In contrast to the comparison group, both mental health (depression symptoms) and spiritual health improved significantly more among intervention participants. 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.

Abstract Word Count: 183
INTRODUCTION

Despite the widely recognised benefits of physical activity for both physical and mental health [1], almost 50% of the Australian population is insufficiently active [2]. Women tend to be less physically active in their leisure-time than men [2]. The development and trialling of interventions to promote increased physical activity, particularly among women, is thus an increasingly important public health priority. Physical activity promotion approaches that target a particular location or setting (e.g. schools, workplaces, communities) where members of the population congregate, provide potential opportunities to influence health in everyday life. 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.

One setting that has only recently been utilised as a location for physical activity interventions is the local community church. One advantage of the church as a setting is that it can involve a holistic approach to health behaviour change, in which physical, mental and spiritual health are addressed. Spiritual health refers to an inherent human quality involving a belief in something greater than the self, and a faith that positively affirms life [3]. Another benefit of the church setting for behaviour change is the existing social support structure. Church support groups have been shown to be valuable in assisting individuals to initiate and maintain behaviour change [4].

Physical activity interventions conducted in the church setting are few, with the majority involving African-American samples [5, 6]. Yanek et al. [5] showed a 20-week holistic intervention program was more effective than a self-help
control group in improving dietary and physical activity behaviours of church-going African-Americans one year after completing the program. In the ‘Healthy Body/Healthy Spirit’ project, 16 Atlanta churches [6, 7] were randomised to either a comparison, self-help or self-help plus telephone counselling intervention, the latter based on a combination of psychotherapy and behavioural change theories. Both intervention groups showed significant increases in physical activity at one-year follow-up. However, the generalisability of these findings to populations other than African-Americans is currently unknown.

In Australia, one 12-week church-based physical activity intervention was conducted among Greek-Australian migrant women [8]. Intervention participants (n=26) were recruited through the Greek-Orthodox church, and the program was run in the church building to make use of existing support groups. However, the comparison group (n=22) was recruited from a different location and were not church-going. Small improvements in exercise heart rate were demonstrated within the intervention group, but effects on habitual physical activity levels were not reported. The program was also not holistic, in that it did not incorporate a spiritual or mental health component, which is often a key element of the church-based setting.

Evidence suggests that incorporating a theoretical model of behaviour change may result in more successful physical activity interventions [9]. Social Cognitive Theory [10] provides a useful framework for promoting physical activity, with its focus on relationships between personal, environmental and behaviour factors. Therefore, this study aimed to investigate the effectiveness
of a holistic church-based health promotion program, based on Social Cognitive Theory, among women. In particular, the study aimed to examine the effects of the program on the key outcome: physical activity; and secondary outcomes: mental and spiritual health.

METHODS

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 self selected into either the intervention or comparison groups and 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 increase their physical activity levels throughout the duration of the program. This research study was approved by the Deakin University Human Research Ethics Committee. All participants provided written informed consent before commencing the program.

Measures

Participants in both the intervention and the comparison groups completed questionnaires to assess physical activity, mental health, and spiritual health, at baseline and week 8, immediately pre- and post-intervention. Demographic characteristics assessed at baseline included age, gender, marital status and
education. Since body weight may be a barrier to physical activity among women [11], self-reported weight and height were assessed and used to calculate body mass index [BMI: body weight (kg) / height (m²)] as a potential confounder.

Physical activity

Physical activity was assessed using the self-report, self-completion survey instrument called the CHAMPS (Community Healthy Activity Models Program for Seniors) survey, which has been validated in the USA and Australia, which assesses physical activity behaviours and attitudes [12, 13]. This measure has been shown to be sensitive to change in physical activity in trials in both the USA [12, 14] and Australia [15].

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 (including 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) [16] 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 [1], time spent in CHAMPS items for activities of vigorous intensity (6 METS or greater) were weighted by two [2]. 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.

Mental health, in particular depression, was assessed using the well-validated CES-D scale [17]. Spiritual health was assessed using the validated Spiritual Well-Being Scale [18]. We calculated that the two scales had internal reliability of 0.91 and 0.94 (Cronbach’s Alpha) respectively.

**Procedure**

This research project was conducted as part of an existing externally run program provided by Careforce Lifekeys Ministries, an initiative of a local church. The program was piloted-tested several times before evaluation.

**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 a relevant health discipline. During the first session (baseline), the initial survey was administered followed by an introduction/orientation to the program. The remaining sessions were conducted weekly at a local church. Each of these sessions included a 45-minute group teaching session on varying topics, 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 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 facilitated
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. The intervention thus incorporated multiple key elements hypothesised by Social Cognitive Theory to be important (e.g. fostering self-efficacy, observational learning and social support, overcoming environmental barriers). The final survey was administered during the final session for both groups.

**Comparison Group**

The comparison group was made up of individuals who had enrolled in a non-health-related relationship education and social support program run by the same local church. That program was designed to help participants learn how to overcome negative past experiences, and to provide strategies and skills needed to make positive and lasting changes in relationships. The program was run concurrently with 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.
Statistical analyses

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 [19] by which available baseline scores on variables were imputed as week 8 scores. 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 outcome variables, a series of one-way MANOVAs was 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 [11]. 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 (spiritual health only), BMI was included as a covariate in a multivariate analysis of covariance (MANCOVA).

RESULTS

Descriptive data on demographics and each of the outcome variables at baseline are presented in Table 1. With the exception of BMI, there were no
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=0.037).

Insert Table 1 here

Mean time spent walking at baseline and week 8 for the intervention and comparison groups are 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 = 0.87, F(1, 46) = 6.96, p=0.011). 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 0.53 hrs/week, CI 0.18, 0.87; t(18) = 3.22, p=0.005; comparison: mean change 0.04 hrs/week, CI -0.16, 0.25; t(28) = 0.44, p=0.664).

Mean times 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 = 0.89, F(1, 44) = 5.52, p=0.023). 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 0.62 hrs/week, CI -0.03, 1.21; t(18) = 2.21, p=0.040; comparison: mean change 0.01 hrs/week, CI -0.21, 0.23; t(28) = 0.44, p=0.920).

Mean depression scores at baseline and week 8 for the intervention and comparison groups are presented in Figure 3. There was a significant interaction between intervention group and time (Wilks = 0.90, F(1, 47) = 5.07, p=0.029). 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, CI -0.61, -9.91; t(18) = 2.38, p=0.029; comparison: mean change 0.43, CI -2.53, 3.39; t(29) = 0.30, p=0.767).

Mean spiritual health scores at baseline and week 8 for the intervention and comparison groups are presented in Figure 4. Results of the MANCOVA (controlling for baseline BMI) showed a significant intervention group-time interaction (Wilks = 0.85, F(1, 43) = 7.41, p=0.009). 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, CI 5.13, 19.32; t(17) = 3.64, p=0.002; comparison: mean change 2.40, CI -0.09, 4.89; t(29) = 1.97, p=0.059).
DISCUSSION

To our knowledge, this study is the first of its kind in Australia, aimed to evaluate the effectiveness of a mind, body and spiritually-based health promotion program in increasing physical activity, as well as improving mental and spiritual health in women. Results suggest that the intervention was effective in significantly increasing physical activity levels as assessed by two different measures: total walking duration; and total time spent in moderate and vigorous physical activity, compared to a comparison group. 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 0.63 hours per week (these two increases share some overlap, as the variables walking uphill and brisk walking were included in both scores). The present findings are consistent with the limited research available in African-American samples in the US [20, 21], and indicate the potential for church-based settings in assisting women in the community to become more active.

Positive effects of the intervention on mental health were also observed 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 [1], although this finding 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 were exposed to the same
amount of time in a support group as part of their program. 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.

The connection between spirituality, or religious practices, and reduced risk of all-cause mortality has been well documented [22-24], 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 significantly improved compared to the comparison group. This finding was unexpected as the comparison group had a similar spiritual component in their program. 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. It is however 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.

Ideally, effective physical activity intervention studies could provide insights into the specific factors that mediate increases in physical activity behaviour. Due to the small number of participants in the present study, we did not have the power to conduct mediational analyses. However, supplementary analyses investigating changes in key cognitive and social factors hypothesised by Social Cognitive Theory to be important (data not shown) demonstrated that self-
efficacy and perceived social support significantly improved, and perceived personal barriers significantly decreased, in the intervention group relative to the comparison group between pre- and post-intervention. These findings, which corroborate those of previous research [25], are consistent with the hypothesis that self-efficacy, perceived barriers and social support are important mediators of changes in physical activity among adults.

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 other important differences between groups (e.g. health status) that were not assessed and that confounded the study findings, although statistical adjustments were made for confounding by 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 (e.g. pedometers or accelerometers) could be incorporated to complement the self-reported measures in future research.

The present results suggest that a church-based holistic health program 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. 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.

Acknowledgments

Kylie Ball is supported by a National Health & Medical Research Council/National Heart Foundation of Australia Career Development Award. Jo Salmon is supported by a VicHealth Public Health Fellowship.

PRACTICAL IMPLICATIONS

- Setting coment.
- Strategy comment.
- Targeting women.
- Effective in increasing physical activity, decreasing depressive symptoms and increasing spiritual health.
REFERENCES


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

<table>
<thead>
<tr>
<th></th>
<th>Intervention n=19</th>
<th>Comparison n=30</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years; mean, SD)</strong></td>
<td>40.2 (10.4)</td>
<td>38.3 (13.0)</td>
</tr>
<tr>
<td>Age range (years; MIN-MAX)</td>
<td>35 (22-57)</td>
<td>50 (18-68)</td>
</tr>
<tr>
<td><strong>BMI (kg/m(^2); mean, SD)</strong></td>
<td>29.5 (7.0)</td>
<td>25.7 (5.2)*</td>
</tr>
<tr>
<td>Marital status (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/defacto</td>
<td>74</td>
<td>63</td>
</tr>
<tr>
<td>Educational status (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school/Trade certificate</td>
<td>42</td>
<td>50</td>
</tr>
<tr>
<td>University or tertiary qualifications</td>
<td>58</td>
<td>47(^1)</td>
</tr>
<tr>
<td>Walking (hours/week; mean, SD)</td>
<td>3.3 (3.1)</td>
<td>3.6 (3.7)</td>
</tr>
<tr>
<td>Moderate and vigorous physical activity(^2) (hours/week; mean, SD)</td>
<td>3.7 (2.8)</td>
<td>4.4 (4.5)</td>
</tr>
<tr>
<td>Depression(^3) (mean score, SD)</td>
<td>17.6 (12.3)</td>
<td>13.5 (8.4)</td>
</tr>
<tr>
<td>Spiritual health(^4) (mean score, SD)</td>
<td>89.7 (22.6)</td>
<td>99.0 (15.1)</td>
</tr>
</tbody>
</table>

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

\(^1\) 3% missing values for the comparison group’s educational status.

\(^2\) Vigorous physical activity weighted by 2.

\(^3\) A higher score = more depression symptoms.

\(^4\) A higher score = better spiritual health.
Figure 1: Total time (hrs/wk) spent walking at baseline and week 8, by group
**Figure 2:** Total time (hrs/wk) spent in combined moderate and vigorous physical activity at baseline and week 8, by group.
Figure 3: Mean depression scores at baseline and week 8, by group
Figure 4: Mean spiritual health scores at baseline and week 8, by group