ORIGINAL RESEARCH

Choose-to-move+ physical activity program

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ABSTRACT

Obesity rates are increasing, resulting in 600 million obese individuals worldwide. Increased physical activity leads to weight reduction in a dose-dependent manner. Social support for physical activity is linked to increased physical activity levels in women. The study purpose was to test the Choose to Move+ physical activity program among 13 obese women. This social support intervention included informational group sessions and physical activities. Within three months, women self-reported a 2.5% increase in time spent in walking and the number of days per week walked. Nurse provided social support may encourage obese women to increase physical activity to improve fitness.

Key Words: Obesity, Choose to move+, Social support, Physical activity

1. INTRODUCTION

Obesity, defined by the World Health Organization[1] as abnormal or excessive fat accumulation, has reached epidemic proportions worldwide. Rates of obesity have more than doubled since 1980; at present there are more than 1.9 billion adults who are considered to be overweight or obese, with 600 million of these individuals obese.[1] Weight status is determined by dividing one's weight in kilograms, to their height, in meters (kg/m^2).[2] Individuals are considered overweight when their calculated body mass index (BMI) $\geq$ than 25, obese with a BMI $\geq$ than 30, and morbidly obese with a BMI $\geq$ than 40. Recent public health initiatives are aimed at decreasing the prevalence of overweight and obesity.[3]

Research has identified negative cardiovascular,[4] respiratory,[5] and metabolic[6] disorders associated with excess weight. Globally, there are many complex factors associated with weight gain and these factors are often culturally specific to one's personal, interpersonal, and community situations. Recommendations to improve health outcomes associated with overweight and obesity include weight loss. Many factors are involved in successful weight loss including: diet, physical activity, social support, education, costs, culture, environmental modifications, adherence to treatments, behavior change, and motivation.[7] Generally, increasing exercise and modifying diet are critical for weight loss.[7] Effective weight loss/management programs are essential for reducing the morbidity and mortality rates associated with obesity and the obesity epidemic. The purpose of this study was to determine if participation in a social support-based physical intervention would increase physical activity and improve physical fitness, regardless of weight loss. The Choose to Move for Positive (+) Living Program was provided to a group of community-dwelling obese women who are members of the Stay-the-Course Community Obesity Support Program.

1.1 Health consequences of obesity

Being overweight or obese has been associated with numerous negative health outcomes, including increased risks for

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cardiovascular disease (CVD) and strokes, type 2 diabetes, certain cancers (endometrial, breast, colon), hypertension, dyslipidemia, liver and gallbladder diseases, sleep apnea, osteoarthritis, and gynecological abnormalities, including infertility.[1] Results from 115,195 women, participants in the Nurses' Health Study (I), concluded that weight gain was associated with an increased risk of all-cause and CVD mortality regardless of the BMI.[8] Similarly, in the 20-year follow-up of 88,393 women in the Nurses' Health Study (II), determined that obesity and physical inactivity independently contribute to CVD in women.[9]

Overweight and obesity have been identified as the main factor predisposing for type 2 diabetes.[10] Once considered a health risk associated with affluence, physical inactivity and an unhealthy diet have been found to increase the incidence of type 2 diabetes among individuals from all economic backgrounds. Approximately 60% of all cases of diabetes are directly attributed to weight gain. Yach and associates[10] posit that the changing demographics, employment that requires minimal physical activity, greater incidences of eating food away from home, and a general decline in activity are the antecedents to obesity, which directly correlate to type 2 diabetes. The worldwide prevalence of type 2 diabetes is reported to be 4.6 million in 2000 and estimated to be 6.4 million by 2030.[2]

1.2 Health consequences of physical inactivity

Physical inactivity is an independent risk for numerous diseases and increases morbidity and mortality rates, regardless of BMI.[11] Strong evidence suggests physical activity rather than obesity leads to cardiovascular disease, hypertension, type 2 diabetes, mental health disorders, including depression and dementia, dyslipidemias, certain cancers, fatigue, osteoporosis, fractures, and falls.[12] Cardiovascular fitness or physical fitness is developed and maintained by regular physical activity and is a better predictor or mortality than obesity.[11] Physical fitness is the ability of the heart to deliver oxygen to working muscles and generate the energy required to perform physical activity with relative efficiency.[13] The current definition of fitness includes not only aerobic capacity, but also includes muscle strength and flexibility, and balance, as all are important in maintaining health.[13] Physical activity recommendations to promote health and fitness in adults are to attain at least 30-60 minutes of moderate intensity physical activity most days of the week and regular strength, flexibility, and balance training, and to reduce inactivity and prolonged sitting.[13] Based on this evidence, it seems that focusing on increasing to heath than fosuing on weight loss might be more beneficial for overweight and obese individuals who have difficulty losing weight and attaining a normal BMI.

Although controversy exists regarding whether losing weight in the obese individual is essential for achieving long-term health benefits from a physically active lifestyle, the negative health consequences of a sedentary lifestyle and "too much sitting" are evident.[14] Hamilton *et al.*[14] provide strong evidence that prolonged periods of muscle inactivity, and particularly when sitting, has deleterious biological and metabolic consequences that predispose to chronic disease. Critical new findings suggest that because of the isometric muscle contractions involved with standing, even without movement, is better than sitting for disease prevention.[15] Because of the negative consequences of prolonged sitting and inactivity, it is essential to actively discouraged prolonged sitting, promote more time spent standing, and increase body movement of any type in all individuals, including the overweight and obese.

1.3 Physical activity interventions for obese women

Focusing on increasing physical activity may be a viable strategy to both prevent and treat obesity and chronic diseases. Physical inactivity has been identified as a major cause of obesity,[16] with adopting an active lifestyle a key strategy in preventing or minimizing obesity. Even in the absence of dietary restrictions, increased physical activity has been associated with weight loss in a dose-response manner.[17] In a 12-month physical activity program, older women who were highly active (> 195 minutes/week) lost 4.2% of their total body fat, compared with losses of 2.4% body fat for moderately active women (136-195 minutes/week) or 0.6% in low active women ($\leq$ 135 min/week), and 0.4% in control subjects.[18] These findings are consistent with a randomized controlled trial that found physical activity was associated with significant reductions in body weight and body fat in obese women in a dose-response manner.[19] Findings from a number of well-designed studies indicate increased physical activity regardless of calorie restrictions leads to body fat and weight reduction in a dose-dependent manner.[17]

The amount of physical activity required to improve cardiovascular fitness, reduce the incidence of chronic diseases, and reduce body fat and body weight have not been clearly identified. Different recommendations are published and understandably many people and health professionals are confused about how much physical activity is required.[20] In an effort to promote national health, guidelines set by Healthy People 2020[21] recommend that all Americans should attain at least 30 minutes of moderate intensity physical activity most days of the week to accumulating 150 minutes per week. In a randomized controlled trial with 464 sedentary, postmenopausal obese women, women were divided into groups

to attain 50% (mean = 72 minutes/week), 100% (mean=136 minutes/week), and 150% (mean = 192 minutes/week), of the activity guidelines recommended by Healthy People 2020 to determine the effect exercise has on cardiorespiratory fitness.[22] Research results demonstrate that even women who participated in 50% of the recommended 150 minutes/week or 72 minutes of moderate intensity physical activity weekly demonstrated some improvement in fitness levels, in a dose-response manner. Results from research conducted by Lee *et al.*[20] indicate that the cardiovascular health of sedentary women can be improved with as little as 72 minutes of moderate intensity physical activity per week. Subsequent research determined that women who are active 1-1.5 hours per week reduce their risk of CVD by half, when compared to sedentary women.[23] Research supports the promotion of physical activity in obese women, even in small doses, as a promising strategy to improve their health, reduce obesity, and minimize their risks for CVD.

Church and associates[22] identified significant improvements in cardiorespiratory fitness when physical activity was modestly increased in obese women, even when significant weight loss did not occur. In the absence of dietary caloric restrictions, it has been recommended that individuals wanting to lose weight by increasing physical activity alone, should engage in at least 60 minutes or more of physical activity.[20] An hour or more a day of moderate intensity physical activity may be overwhelming or difficult for many obese women to accomplish. Attainable, effective, and appropriate strategies are needed to promote active lifestyles in sedentary, obese women. Nurses and other health care providers should identify and implement creative new approaches to help obese women adopt and maintain active lifestyles to facilitate weight loss and weight management.

Social support is a key indicator of health behavior change.[24] The perceived need for social support for physical activity in obese women has been strongly linked to increased physical activity behavior.[3,25,26] In a study with 999 racially-diverse, overweight adults (66% female), social support from family members was associated with higher levels of physical activity (β totals = .16).[25] Additionally, the effect of social support from family indirectly promoted physical activity levels through its effects on self-efficacy (β indirect =.20; β direct = -.04). In a one year study designed to increase physical activity in a group of 239 pre-menopausal obese women, the need for support (term used for support from intervention staff) was significantly correlated with lifestyle, moderate and vigorous physical activity levels (r = .16-.17; $p < .001$). In the Heart and Soul Physical Activity Program (HSPAP), the intervention group of 20 women (mean age = 53.7) received appraisal, tangible, belonging, and self-esteem domains of social support to promote physical activity in group sessions. The comparison group of women (mean age = 48.3) received health information also via group meetings.[27] Both groups more than double the amount of time spent in physical activity per week over the 3-month period, increasing from 67 minutes per week at baseline to 141 minutes per week 12 weeks later.[27] Although the difference in change in moderate intensity physical activity between the two groups over time was not significant (p = .09), the effect size was medium (η^2 = .09) and suggests social support and group activities may lead to increased physical activity among overweight/obese midlife women.[27] Social support for physical activity may be one strategy to increase physical activity, energy expenditure, and promote weight loss in obese women. A holistic approach to providing healthcare to obese individuals is recommended and the approach should combine physical, social, and emotional factors.[28] The American Heart Association Choose to Move for Positive (+) Living Program is conceptually based in social support and was tested for feasibility in a group of obese women to promote physical activity.

2. Study Methods

2.1 Design

This study was a pretest-posttest design to determine if a group support program which included a physical activity intervention and social support via group sessions improved the physical activity levels among obese women. The aim of the support group was to provide emotional/psychological support and education which focused on being healthy, yet "plus size". Members of this group consented to participate in the Choose to Move for Positive (+) Living Program only if weight was not calculated (it was self-disclosed) and not used as an outcome measurement. Institutional Review Board (IRB) approval was secured from the university which employees the researchers.

2.2 Study instrument

In an effort to determine benefits of a moderate intensity exercise program, each consented individual completed the International Physical Activity Questionnaire – Short form (IPAQ-S) prior to any intervention. This 7-item categorically-scored questionnaire is publically available, accessible through the IPAQ website (`https://sites.google.com/site/theipaq/home`), and may be used without charge. The IPAQ-S reports participation in physical activity within the previous seven days. The IPAQ-S[29] has been validated against accelerometer-determined physical activity measures. While these results demonstrated a lower correlation among women, the questionnaire is capable of determining the ability to meet physical activity recommendations. For this specific

study population, results on the IPAQ-S documented minimal physical activity was routinely occurring among program participants at baseline. Thus, the ability to describe the physical activity results of this physical activity intervention was possible.

2.3 Study intervention

The Choose to Move for Positive (+) Living intervention was a weekly physical activity and informational session with a focus on lifestyle physical activity that was adapted for obese women from the American Heart Association's Choose to Move program.[30] The intervention included various components of social support to encourage women to participate in physical activities chosen by the participants, including chair yoga, country line dancing, swimming, stretching, and working with weights. Time was spent during each intervention to provide psychological and informational support for physical activity. Weight loss was not the focus of this intervention. Baseline heart rate and blood pressure and self-disclosed weights were collected. Specifics related to the intervention and the results of various psychological outcomes (depression, quality of life, social support for exercise, stage of behavior change) were obtained and previously published.[31]

3. Results

A total of 13 women completed all aspects of the study. Demographically, these individuals were between the ages of 28 and 63 years (mean = 54; SD = 11.4). Each participant self-reported the presence of at least two chronic health conditions. Diabetes and joint pain were reported by 12 of the participants. Other health conditions included CVD (n = 9), respiratory disorders (n = 9), depression (n = 8), urinary incontinence (n = 7), skin disorders (n = 6) and circulation 'issues' (n=2). The participants in this study were members of a community-based support group, specifically for obese females. Data reflect the majority of them (n = 7) participating in zero minutes of vigorous or moderate exercise within the previous seven days. Of those that reported participating in vigorous exercise, the mean total time for the 7 days was 21 minutes (range 5-60); the mean total time for the those participating in moderate exercise (n = 6) was 22 minutes (range 5-60) for the week. Seven participants reported walking at least 2 days per week, for an average of 18 minutes per day (range 10-60). Each participant estimated the time spent sitting, per day. This ranged from 300 to 840 minutes (mean 396 minutes). Thus, this study population was sedentary with little routine daily exercise.

Pre intervention blood pressures (BP) were obtained. At baseline, these ranged from 102/72 to 148/81 (mean = 126/81). At the end of the three month intervention, BPs ranged from 104/70 to 148/90 (mean 130/81). These data indicate that these individuals were not hypertensive and medically able to participant in the planned activities. When measured at the end of the three month intervention, this vital sign did not significantly change.

Self-report data, collected at the end of the intervention, indicates that these individuals did engage in more frequent and longer moderate intensity and walking – based activities. Participation in moderate exercise was initially reported by six of the participants, with an average of 22 minutes per week. Three months later, moderate activity was reported to occur by nine individuals, at an average of 35 minutes per week. Walking, initially reported occurring two times per week, for a mean of 12 minutes, by seven participants, increased to five times per week by nine of the participants, with 30 minutes per day, the new mean. Sitting, initially reported as encompassing 396 minutes per day, was now estimated to comprise 280 minutes per day. Participation in vigorous activities, initially reported by seven of these participants as not happening at all, remained an activity that did not occur for the same seven individuals, which did not change in response to study participation

Table 1. Mean scores of activities monitored in the study

Activity	Pre-intervention Mean Score	Post-intervention Mean Score	Change
Moderate exercise	22 minutes/day	35 minutes/day	1.6% increase
Walking per week	2 days	5 days	2.5% increase
Time walked	12 minutes	30 minutes	2.5% increase
Daily sitting	396 minutes	280 minutes	1.4% decrease

Qualitative data were collected using a focus group format prior to the weekly intervention. These data were recorded by note-taking, and analyzed by frequency of specific content.[32] This analysis reflects new knowledge among these participants with respect to what constitutes exercise and an awareness that they can participate in physical activity. The belief that activities, done outside a gym environment, constitutes exercise was unknown. The perception that one had to

belong to a gym and go to a public place to "exercise" was expressed by 10 of these individuals. Each educational session focused on the levels of exercise (vigorous, moderate) was well received. While each of these participants expressed that vigorous exercise was not something they were interested in, knowing that moderate activity could make a difference in their health was enlightening. Each participant expressed a conscious effort to minimize sitting each day. Each participant described "feeling better" after exercising, and a desire to continue these activities. No one mentioned weight loss as a desired outcome among this group. In fact, self-reported weight actually increased among these participants by an average of four pounds during the course of the intervention (pre mean = 294.92; post mean = 298).

4. Discussion

These women were already participating in a community-based support group and had set a goal aimed at improving their health, although weight loss was not specifically a goal for this group. These individuals were significantly physically impaired and unable to complete minimal basic physical activity standards initially. Several of these women were morbidly obese and this adiposity greatly impaired their mobility. Upon completion of the six month intervention, these individuals were not only able to increase their intervention-associated physical activity,[31] but they were performing more individual physical activities, and for greater duration and intensity. Table 1displays these changes.

In addition to marked changes in the amount of activity, one more participant reported performing moderate exercise on a routine basis, and two additional participants included regular walking at the post-intervention data collection interval. We believe that specifically stating that the purpose of the intervention was not to lose weight, but to improve fitness, allowed individuals who would not have participated otherwise, the desire to participate. Providing this intervention in a safe space, specifically targeting and including only obese women, was of value to the participants. Despite the small sample size, the results of this study describe the preferred setting and outlined appropriate activities which will result in activity engagement among obese women. The purpose of this pilot project was not to initially target weight loss, but was designed to increase the physical activity and fitness levels of these obese women. Although, sample size was small, encouraging women to include greater amounts of physical activity into their daily lives helped them to improve their fitness levels without focusing on weight loss.

5. Conclusion

This study demonstrates that a social support intervention designed to increase physical activity among obese women, rather than targeting weight loss, resulted in increased levels of physical activity. Nurses have an important role in encouraging active lifestyles for all individuals, including the obese. Health professionals might assume that targeting physical activity among the obese would be ineffective, but this study shows that encouraging and supporting obese women to be more active can have positive results. Future research should include a larger sample size, different geographical settings, and providing the intervention over a longer period of time. Yet, the effect that social support had on the physical activity levels of obese women, along with improved health outcomes, remains supported by this research.

Conflicts of Interest Disclosure

The authors declare that there is no conflict of interest statement.

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