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ORIGINAL RESEARCH

WORKSITE BASED WALKING COMPETITION: EFFECTS ON PERCEIVED STRESS AND PHYSICAL ACTIVITY IN FEMALE UNIVERSITY EMPLOYEES

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ABSTRACT

Introduction: Stress is an increasing concern for female university employees, due to increasing work hours and stress induced by trying to maintain work-life balance. Therefore, it is important for worksite health promotion programs to focus on effective stress management programs, especially for women. The purpose of this study was to evaluate if a worksite walking competition could decrease stress and increase physical activity levels for female university employees.

Methods: Thirty-nine female employees who participated in the four week Workplace Walkoff Competition (WWC) volunteered for the study. Perceived stress, days walking, and days of moderate and vigorous physical activity per week were assessed before and after the competition.

Results: There was a significant decrease in perceived stress pre- to post-competition (PSQ Mean Score = 0.32±0.16 vs. Mean Score = 0.27±0.12, $p = 0.012$). There was a significant increase in walking days per week pre- to post-competition (Mean = 4.4±2.3 days vs. Mean = 5.8±1.8 days, $p < 0.001$). Despite a trend, there was no change in moderate physical activity pre- to post-competition (Mean = 2.5±2.1 days vs. Mean = 3.1±2.4 days, $p = 0.07$) However, there was a significant increase in vigorous physical activity days pre- to post-competition (Mean = 2.2±2.0 days vs. Mean = 2.8±2.3 days, $p = 0.03$).

Discussion: The ability to carry out low cost, short term programs at universities without continuous health promotion programs may have potential for improving stress and employee health indicators, including physical activity amounts.

CONCLUSIONS: Worksite walking competitions may be implemented as an effective intervention to improve health indicators in female university employees. The improvements in health indicators are an overall benefit to the workplace.

Keywords: Physical Activity, Stress, Worksite Health Promotion

ISSN 2201-5655

INTRODUCTION

Job related stress is a well-studied topic within many industries. However, there has been much less focus on university employees. University job positions were once thought to be low-stress due to high autonomy and a socially supportive work environment[1]. However, during the last 30 years, there is evidence of increasingly high job stress among university employees[1-3]. Gillespie et al. (2001) found that over 90% of university employees included in their study reported work-related stress with low levels of job satisfaction. There has also been an increase in the amount of work-related claims related to stress in university settings[5,6].

Work-related stress can be detrimental to overall health; risk of cardiovascular mortality increases with higher job strain and a high effort-reward imbalance[7]. Evidence suggests that the detrimental effects of work stress include increased heart rate during a stressful work day, along with increases in systolic blood pressure and decreased vagal tone[8]. University employees with high work related stress are also more likely to use food as a coping mechanism, and less likely to exercise due to work related stress[9].

Stress is a major concern to women in the workforce for many factors; there has been a sharp rise in women in the workplace since the 1970's, and more women work full- time and in year round positions[10]. A substantive body of literature demonstrates differences in stress levels between men and women. Women report higher levels of stress due to increased pressure to maintain both work and domestic responsibilities. Research demonstrates that the greatest influence to work stress is the combination of job, domestic and social demands[11]. Duxbury & Wiggins (2003) term this "role overload" and results indicate that women especially struggle to maintain work-life balance. Further, research indicates that women do not maintain balance between work, domestic responsibilities and leisure time as well as men[13]. Due to the higher levels of stress reported among women, along with the significant rise in women in full-time positions, makes them an important population for research.

Worksite health promotion programs provide numerous individual and organisational benefits. These individual benefits include improvements in health indicators of employees such as body mass index (BMI), cholesterol and blood pressure levels[14,15]. For the organisation, inclusion of worksite health promotion programs lead to a decrease in absenteeism and an increase in job productivity, and substantial health care savings[16,17].

Research has demonstrated regular physical activity can decrease perceived stress[18]. University employees who are more physically active report less work-related stress[9]. Likewise, university employees classified as high stress had riskier health profiles, including less exercise, higher BMI's, and rated their overall health lower than their more active counterparts. In addition, physical activity participation has the potential to improve mental health[19]. Individuals who have higher physical activity and cardiorespiratory fitness levels have been shown to have less depressive symptoms, along with greater reported emotional wellbeing[18].

There are mixed results regarding worksite physical activity interventions' ability to increase daily physical activity among university employees. Leininger et al. (2013) found that participants of university worksite health promotion programs are more active than non-participants. However, De Cocker et al. (2010) found a decrease in steps per day following a workplace walking intervention program, with very few individuals stating they had changed their physical activity behavior due to the program.

Based on prior research, physical activity participation has been associated with decreased stress[18,19]. Additionally, research demonstrates that worksite walking programs have potential to increase daily physical activity among employees. A review of the literature revealed no studies that assessed the effects of a worksite walking program on stress levels of female university employees. Therefore, the purpose of this study was to evaluate if a short term worksite walking competition could decrease perceived stress and increase physical activity levels among female employees.

METHODS

During the university's spring semester, the Human Resources Department at a small California university sponsored the Workplace Walk-off Competition (WWC) open to all 878 employees (females n = 508, 58%, males n = 370, 42%). The WWC was a collaborative effort between Human Resources and the university Kinesiology Department. The four week WWC included a "Kick-Off" event and a weekly "Lunch & Learn" meeting for each of the four weeks, with presentations by Kinesiology faculty, and an awards ceremony.

The WWC participants formed teams of five individuals. Individually, they recorded total of number of steps per week with pedometers. The total number of steps was reported on a team website. The organisers of the program computed the total number of steps for individuals and total team steps for the four-week intervention. Winners were determined by the greatest number of total steps accumulated per team during the competition.

The Kick-Off Event was a luncheon where teams were introduced to one another, and the rules of the competition were explained. The Kick-Off Event was also used as a recruitment tool to enroll participants in the research project. The Lunch and Learn events were held weekly, with educational topics to assist with improving health behaviors. The Lunch and Learns topics included: Motivation and Overcoming Barriers to Exercise, Nutrition 101, Myths about Physical Activity and Nutrition, and How to Construct a Home-based Workout. The Awards Ceremony was a celebration of individual and group accomplishments. Prizes were also awarded to the teams and individuals who accumulated the most steps throughout the four weeks. As an incentive for attendance at all events, door prizes were advertised. Awards and prizes were donated by local businesses.

Of the 878 staff members (non-instructional support personnel), instructional faculty and non-instructional administration (both full and part time), 105 employees participated in the WWC (79 females, 26 males). All 105 participants in the WWC were successful in reporting their weekly step count for the four-week competition. Of those individuals, 39 females volunteered to participate in the study. Approval to conduct the study was granted by the University's Human Subjects Institutional Review Board. Participants provided signed informed consent to participate in the study. Participants were screened for the ability to perform basic mild activity (e.g., walking) using the PAR-Q[22].

The study was a pre/post design that coincided with the WWC. The week prior to the beginning of the competition, participants completed the Perceived Stress Questionnaire (PSQ)[23] and the International Physical Activity Questionnaire (IPAQ)[24]. The questionnaires were then administered one week following the competition conclusion.

The Perceived Stress Questionnaire (PSQ) is a 30-item questionnaire asking participants to indicate how often each statement applies to them. Test-retest reliability for the PSQ was 0.82 and demonstrates construct validity[23]. The PSQ has been previously validated with both male and female participants[23]. The IPAQ is a self-reported measurement tool asking the participant to report number of days of walking for more than 10 minutes at one time, and number of days that the individual participated in moderate physical activity (other than walking) and vigorous physical activity. The IPAQ also inquires about the typical length of the exercise sessions. Reliability for the IPAQ is 0.80, with validity reported as 0.30, which is consistent with similar self-report physical activity measures[24] The IPAQ has reasonable measurement properties for monitoring physical activity among adults in diverse settings, including women[24].

Participants logged their weekly walking activity using a website developed by the organisers. Weekly updates provided overall team standings. The website included education on physical activity requirements and other health tips. Students from the Kinesiology Department acted as team advisors, sent out encouraging emails and scheduled group walks with their teams.

Data analyses were conducted using SPSS 19.0. The dependent variables for the study were PSQ

score, days of walking, days of moderate physical activity and days of vigorous physical activity. To assess differences in these variables, dependent t-tests were performed. The level of significance was set at $\alpha = 0.05$.

RESULTS

Demographic variables (n = 39) were self-reported at the beginning of the questionnaire. Mean age of participants was 42.1±12.6 years, with the mean amount of sit time at work per week of 29.3±11.2 hours, indicating a sedentary work environment for most employees. Most participants indicated their job position as staff (Staff = 82.1%, Faculty = 7.7%, Administration = 10.3%). A total of 30 participants returned for the follow up appointment, and were included in the data analysis (Nine individuals did not return). Seven participants were unable to return due to conflicts of schedule and other work and life commitments, such as meetings, teaching classes and off campus appointments. Two participants were on vacation during the week of follow up appointments.

There was a significant decrease in perceived stress pre- to post-competition (PSQ Score Mean = 0.32±0.16 vs. PSQ Score Mean = 0.27±0.12, $p = 0.012$). There was a significant increase in walking days per week pre- to post-competition (Mean = 4.4±2.3 days vs. Mean = 5.8±1.8 days, $p < 0.001$). Despite a trend, there was no significant difference in moderate physical activity pre- to post-competition (Mean = 2.5±2.1 days vs. Mean = 3.1±2.4 days, $p = 0.07$) However, there was a significant increase in vigorous physical activity days pre- to post-competition (Mean = 2.2±2.0 days vs. Mean = 2.8±2.3 days, $p=0.03$).

DISCUSSION

The purpose of this study was to evaluate if the WWC could decrease perceived stress and increase physical activity levels for female university employees. Results demonstrated a significant decrease in perceived stress following the WWC. Specific comparisons to university women employees are lacking. However, research indicates that physical activity improves perceived stress and overall well-being in general[19, 25]. For example, Marshall (2004) demonstrated that physical activity programs were effective at reducing job stress and increasing job satisfaction. In contrast, a recent randomised control trial of a worksite health promotion program demonstrated no significant differences in stress[27].

There was a significant improvement in walking days per week following the competition. In addition, results show significant increase in vigorous physical activity days per week post-competition when compared to vigorous physical activity days pre-competition. Previous research in the effectiveness of worksite programs to increase physical activity is mixed. Most research indicates an increase in physical activity amounts as a result of worksite physical activity interventions[20]. Walking programs in particular have been very effective[14,28]. However, De Cocker et al. (2006) found that a long term, 20-week intervention was not effective in increasing step counts per day for employees. Results of their study imply that participants were encouraged by the intervention to be more physically active in other modes outside of the walking competition. Despite a trend for improvement in this study ($p=0.07$), there was no significant increase in moderate physical activity, pre- to post-competition. One may speculate that the participants focused on walking, and therefore did not focus on other forms of moderate physical activity.

Decreased stress and increased physical activity levels, as demonstrated in this study, can have many positive effects on both the employees and the organization. Public health research clearly demonstrates the benefits of stress reduction and increased physical activity on well-being[22]. Puig-Riber et al. (2008) found that university employees in a walking intervention not only increased their physical activity, but also had higher quality of life and job performance ratings compared to their non-participant counterparts. Additional organizational benefits from improvements in health include decreased absenteeism, increased

productivity which can lead to significant cost savings[30].

There are some limitations to the study worth noting. The major limitation of this study was that it was not controlled. Therefore, the stress and activity results may have been influenced by other factors related to the program, such as the Lunch and Learn sessions or the information and motivation received from the individual Kinesiology students who were working with the teams . Also, physical activity data were self-reported, using the IPAQ, which has moderate reliability and validity ratings.

IMPLICATIONS FOR PRACTICE

The intervention in this study was four-weeks in duration, and may be effective in decreasing perceived stress and increasing physical activity. This demonstrates that short-term, low-cost physical activity programs have the potential to be an effective option for universities who are unable to support a long term health promotion program. Health promotion professionals could administer many short-term programs per year in an effort to improve the health of their employees.

Cost and time for planning programs is a major concern for many worksites. This program was planned, administered and evaluated by a Kinesiology Professor in conjunction with six Kinesiology students. This program was accomplished with a "shoe-string" budget (less than $250), on a campus without a continuous worksite health promotion program. This low cost study was conducted with limited personnel by using the expertise of a university's academic program. A key hidden benefit, unique to the university, was the involvement of students who received valuable practical training by applying their knowledge, skills and abilities acquired in course work. Additionally, participants (primarily university support staff) commented on feeling an increased connection to the students and the academic mission of the university.

Many worksites also have equipment and space limitations for exercise programs. This program focused on walking as the main mode of physical activity and encouraged participation at work, by using the university campus walk ways and trails. Besides being cost effective, nature contact at work can be beneficial to perceived stress levels. Largo-Wright et al. (2011) found that as workday nature contact increased (like walking outside), perceived stress and health complaints decreased among university employees. The authors conclude that increasing activities outdoors offer a simple approach to promote workplace health. The results of the current study are consistent with this finding.

CONCLUSIONS

Other universities may benefit from similar programs. The ability to carry out short term programs at universities without continuous health promotion programs may have potential for improving stress and employee health indicators, including physical activity amounts. Further research should continue on short term physical activity program effects on health indicators, such as stress, at various types of worksites.

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