

2020

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Exercise is Medicine[®] on Campus: Effectiveness of an Employee Circuit Training Class

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Received July 07, 2020; Revised July 18, 2020; Accepted July 28, 2020

Abstract Exercise is Medicine[®] on Campus (EIM-OC) is a global health initiative lead by the American College of Sports Medicine (ACSM) to integrate physical activity (PA) into university campus culture and establish PA as a vital sign. There is limited research on the EIM-OC, especially studies which include university employees. Therefore, the purpose of this study was to evaluate the effectiveness of an EIM-OC sponsored employee circuit training class at increasing PA and reducing perceived stress in participants. Out of 20 class participants, 12 females volunteered to take part in the study. Data was collected with an online questionnaire that included the Godin Leisure-Time Exercise Questionnaire (LTEQ) and Cohen's Perceived Stress Scale. Paired-samples t-tests were performed for LTEQ score, PA days, and perceived stress score. Physical activity score significantly increased ($p=.05$) from pre-to post-training. Moderate days of PA significantly increased from pre-to post-training, but strenuous and light days of PA were not statistically significant. Perceived stress scores improved significantly ($p<.001$) from pre-to post-training. These results demonstrate that EIM-OC employee exercises classes can be an effective program offering to increase PA and improve perceived stress among university employees.

Keywords: *Exercise is Medicine on Campus, worksite health promotion, exercise, employee health*

Cite This Article: Lisa J. Leininger, Joanna L. Morrissey, Mark DeBeliso, and Kent J. Adams, "Exercise is Medicine[®] on Campus: Effectiveness of an Employee Circuit Training Class." *Journal of Physical Activity Research*, vol. 5, no. 1 (2020): 45-48. doi: 10.12691/jpar-5-1-9.

1. Introduction

There is substantial evidence that physical activity (PA) and exercise are beneficial in the prevention of diseases such as diabetes, cancers, hypertension, depression and coronary artery disease [1]. Additionally, PA and exercise have the ability to help treat and manage disease and improve quality of life for those with chronic disease or stress. A review from 2015 indicated that exercise could be prescribed for the treatment of 26 different conditions ranging from psychiatric disorders to metabolic diseases [2]. Therefore, many health professionals are now sharing the message that PA and exercise are a type of medicine [3].

Due to the numerous benefits of PA and the potential to be a powerful tool in health care, the American College of Sports Medicine (ACSM) and the American Medical Association (AMA) launched Exercise is Medicine[®] (EIM) in 2007. EIM is a global health initiative with the mission to make PA a standard of clinical care and establish PA as a vital sign [4,5]. Research indicates that broad implementation of EIM has the potential to increase PA levels if a PA counseling and referral system are in place [6].

In 2009, Exercise is Medicine[®] On Campus (EIM-OC) was established to help universities integrate PA into

the campus culture [4]. Universities have the unique opportunity to promote PA to both students and employees. For instance, students are at a transitional period in their lives, where lifetime health habits are formed, and individuals with expertise in PA are available to facilitate initiatives and programming. Extending the programming to employees encourages the development of a healthy campus culture. EIM-OC offerings to employees can also be viewed as a worksite health promotion (WHP) effort, with many potential benefits.

WHP programs at universities have the potential to increase PA, reduce stress, and improve health indicators [7,8]. Leininger et al. found that a worksite-based walking competition reduced perceived stress among female employees [7]. Perceived stress is a major health issue in the workplace, and is associated with greater vulnerability to life-event related depression symptoms, more upper respiratory infections, failure to control blood sugar and failure to quit smoking [9].

There is limited research on EIM-OC programming, especially related to university employees. Most research on campuses focus on implementation of programming and events targeting students [10]. In 2018, Wilson et al. found that 61.98% of EIM-OC campus respondents focused their greatest effort on student wellness. The percentage of programs that identified a focus on faculty

and staff wellness was 22% [10]. The research that does exist indicates that large, diverse populations on campuses can be successfully engaged [11]. One study implemented EIM-OC events over the course of a week, and used it as a platform to collect PA data from students. Their findings indicated that programmed events were successful from a participation standpoint and engaged a large portion of the campus community. Their student PA data revealed PA levels consistent with national norms for college-aged students [12].

The purpose of this study was to evaluate how effective the inaugural EIM-OC employee exercise class was in increasing PA and reducing perceived stress among participants. We hypothesized that PA would increase following the class and perceived stress would be reduced.

2. Methods

2.1. Program Description

EIM-OC was launched at California State University, Monterey Bay (CSUMB) in fall semester 2019 with program offerings for both students and employees. The initiative was launched and implemented by a team of three Associate Professors, with assistance from three student leaders, the campus health center Health Educator, and the Kinesiology (KIN) Department Chair. Student programming focused on peer mentoring, while employee programming focused on in-person exercise classes. Other offerings included a weekly “Run, Walk, and Roll Club,” campus wide events and an “EIM-OC Week” [13]

The inaugural employee exercise class was “Introduction to Circuit Training (CT),” which lasted six weeks. The class was held twice a week from noon-1pm, and was facilitated by KIN majors who had completed course work in personal training and strength and conditioning. The students were supervised by a KIN Associate Professor. The student facilitators were also required to attend an orientation and training led by the faculty lead. Classes were held in a small workout facility maintained by the KIN Department. Sign-ups were on a first-come, first-serve basis and were capped at 20 participants due to space constraints.

The students designed each workout, which included 8 stations for the circuit, and incorporated exercises for each major muscle group and cardiovascular exercise. Most exercises were body weight or used resistance bands, but some dumbbells and barbells were utilized (e.g. for bent over rows, bicep curls, etc.). For most workout sessions, each person would remain at a station for 45 seconds, and perform as many repetitions of the exercise as possible in the time period. Participants were encouraged to work within their own abilities and fitness levels, and student facilitators assisted in bringing various equipment (lighter or heavier weights) to participants or offer exercise modifications as needed. With transition and set up times, one circuit lasted approximately 12 minutes. The class began with completing two circuits, and following the first two weeks, increased to three circuits during the allotted time. Each workout session ended with light stretching and deep breathing exercises that focused on the head and neck (since the employees were primarily desk based occupations).

2.2. Research Design

The research design was pre-post and tracked university employees who participated in the EIM-OC Introduction to CT course. The Institutional Review Board at CSUMB approved this study and all participants signed an informed consent.

2.2.1. Instrumentation

An online questionnaire was administered one week prior to the beginning of the CT course, and the day following the end of the course. The questionnaire included demographic questions for age, income, job position and ethnicity. The Godin Leisure Time Exercise Questionnaire (LTEQ) [14] and the Perceived Stress Scale (PSS) [9] were also included.

The LTEQ is a commonly used self-report tool to assess amount of physical activity and intensity. Several validation studies support the use of the questionnaires classification system for healthy adults [15,16].

The PSS is one of the most widely used psychological instruments for evaluating stress as perceived by the individual. Scores on the PSS have shown adequate internal consistency reliability, and moderate concurrent criterion validity [17].

2.2.2. Statistics

Paired-samples t-tests were performed for LTEQ-PA score, strenuous days of PA, moderate days of PA, and light days of PA per week. A paired-samples t-test was also performed for PSS score. All statistical analysis was done on SPSS version 25. Significance was set at $\alpha = 0.05$.

2.3. Participants

Study participants were recruited from the Introduction to CT course. Of the 20 class participants, 15 women volunteered to participate in the study. Twelve women completed both surveys and were included in the statistical analysis. Mean age was 43.8 (± 12.6) years. Participants included 1 administrator and 11 staff members. See Table 1 & Table 2 for ethnicity and income demographics.

Table 1. Participant Ethnicity

	N	%
Asian/Pacific Islander	2	16.7
Hispanic/Latinx	2	16.7
Native American	1	8.3
White	6	50.0
Other	1	8.3

Table 2. Participant Household Income

	N	%
\$30,000-39,999	1	8.3
\$40,000-69,999	1	8.3
\$70,000-99,999	3	25.0
\$100,000-149,999	3	25.0
\$150,000 or more	2	16.7
Prefer not to disclose	2	16.7

3. Results

LTEQ-PA score was significantly significant ($t=-1.7$, $df=11$, $p<.001$) from pre ($M=38.9\pm16.9$) to post ($M=49.1\pm23.9$) CT class. See Figure 1.

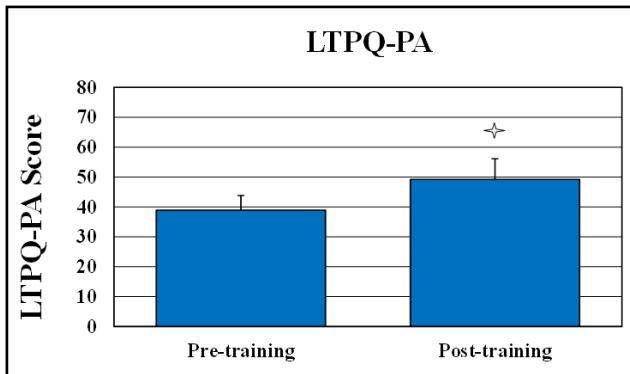


Figure 1. Leisure time physical activity score ($*=p<.05$)

Strenuous days of PA per week were not statistically significant ($t=-1.4$, $df=11$, $p=.09$) from pre ($M=1.5\pm1.3$) to post ($M=2.0\pm1.7$) CT class, although results trended towards an increase. Moderate days of PA per week were statistically significant ($t=-2.4$, $df=11$, $p=.017$) from pre ($M=2.5\pm1.1$) to post ($M=3.3\pm1.3$). Light days of PA per week were not statistically significant ($t=-0.6$, $df=11$, $p=.2$) from pre ($M=4.1\pm1.8$) to post ($M=4.5\pm1.7$), though results trended towards increasing. See Figure 2.

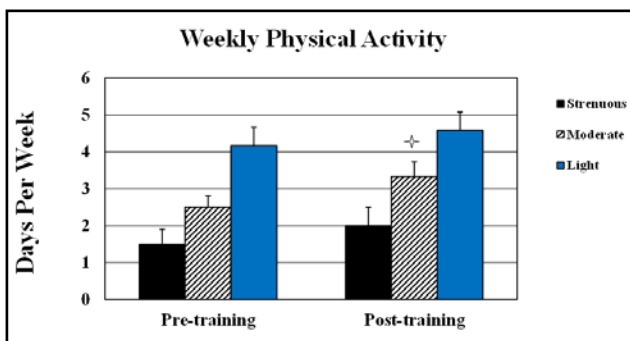


Figure 2. Strenuous, moderate and light intensity physical activity days per week ($*=p<.05$)

PSS score was significantly significant ($t=5.0$, $df=11$, $p<.001$) from the week before the CT class ($M=15.5\pm7.2$) to the week following the CT class ($M=12.5\pm5.7$). See Figure 3.

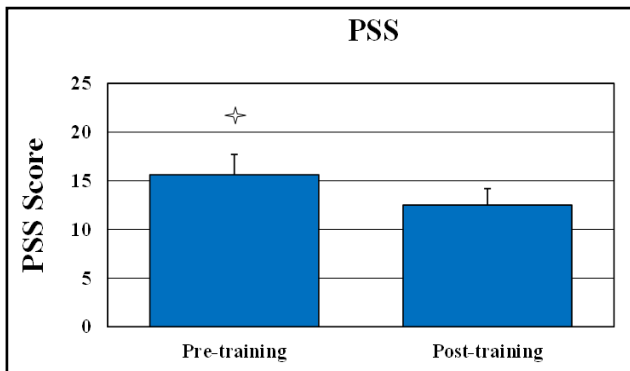


Figure 3. Perceived stress scale score. $*=p<.05$

4. Discussion

The purpose of this study was to evaluate how effective the EIM-OC employee CT class was in increasing PA and reducing perceived stress among participants. Our hypotheses were partially supported, as PA score significantly increased. Strenuous and light days of PA were not statistically significant, but both trended towards increasing, with moderate days of PA increasing significantly. These results are consistent with previous research that indicated the effectiveness of WHP programs in increasing PA among university employees [7,18,19,20]. Additional research indicates that employees with WHP programs tend to be more active [20]. This is important, as research supports that increased PA provides significant health benefits to the individual [21].

These results are also consistent with previous research that demonstrated reduced perceived stress after participation in a WHPP [7]. Norm scores for PSS were established by an L. Harris Poll in 1994. Prior to the CT class, the mean PSS score of participants was 15.5, which ranks as above average for females in the United States [22]. Following the CT class, the mean score of 12.5 falls below the mean norm for females in the United States. Reduced stress also has significant health benefits to the individual (e.g., improved quality of life) and the worksite (e.g., increased presenteeism and productivity) [9,23,24]; and, the potential combined benefit of increased PA and reduced stress cannot be overstated.

There are some limitations to this study. First, the number of participants was small due to space constraints of the exercise class. Additionally, the population who chose to take the class and volunteer for the study were primarily staff members and all female. Therefore, the results of this study may not be generalizable to the entire campus community.

The fact that all class participants were female, and nearly all women, is not unusual in WHP programming and research [25]. There are likely several reasons for this observation. First, WHP provides a time and place for individuals to exercise and practice self-care that they may not be able to do at home. Many women report that the responsibilities at home, including child care, impede their ability to exercise before or after work [26,27]. Additionally, staff members usually have set schedules in their offices, versus faculty who often have variable schedules and are not bound to their offices for the majority of the day. It is worth noting though, that of the 12 female participants, half of all participants identified as an ethnic minority, including Asian, Hispanic and Native American. Although a small sample, this indicates that the program was successful in recruiting minorities and improving health indicators of these groups who often suffer from chronic diseases at disproportional rates to Whites [28].

The authors wish to highlight that at as of writing this manuscript, the planet is facing the COVID-19 pandemic. Lack of PA has also been called a pandemic by many public health experts [29]. Combatting sedentary isolation during these times is critical to physical and mental health [30]. This WHPP could easily be facilitated with employees over a medium like Zoom using bodyweight exercises and home-based implements (e.g., milk/water jugs), encouraging both PA and social engagement with co-workers during difficult times.

This study is significant because it begins to fill a gap in the literature regarding EIM-OC programming for university employees. Future research should focus on increasing participation among other campus employees, especially men and faculty, who have traditionally not used WHP programs at the same rates as female staff members [20,25]. In light of the COVID-19 pandemic, this study could also be adapted to online/virtual offerings.

To conclude, because this study was successful in improving health indicators among female university employees, these types of offerings should continue to be included in EIM-OC programs.

Acknowledgements

The authors wish thank the student leaders of EIM-OC, the student class facilitators for their dedication, hard work and reliability during the class and data collection. The authors would also like to thank the class and study participants who made the inaugural EIM-OC circuit training class a success!

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