

Effectiveness of an Exercise is Medicine-On Campus® Virtual Program on Perceived Stress Levels of Faculty and Staff

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Abstract Exercise is Medicine on Campus (EIM-OC) is a global initiative created by the American College of Sports Medicine (ACSM) which aims to improve the health and well-being of students, faculty and staff on college and university campuses. Faculty and staff experience a variety of stressors through their profession; with the Coronavirus pandemic only exacerbating these stressors. Due to the stay-at-home orders placed across the world, it became increasingly difficult to engage in physical activity as facilities were closed or at limited capacity. Therefore, the purpose of this study was to examine the effects of a virtual exercise program on perceived stress levels of faculty and staff at California State University-Monterey Bay (CSUMB). The classes were available to the entire CSUMB community, with eight female employees completing the entirety of the study. Data was collected using an online survey tool with measures including Cohen's Perceived Stress Scale (PSS) and Godin Leisure-Time Exercise Questionnaire (LTEQ). A paired samples *t*-test was conducted for the PSS, the LTEQ and days of physical activity. Overall, perceived stress significantly decreased ($p < .002$) and physical activity significantly increased ($p = .012$). Days of strenuous, moderate and light physical activity were not significant but all trended toward an increase. These results provide evidence of virtual exercise programs decreasing perceived stress levels and increasing overall amount of physical activity.

Keywords: worksite health promotion, virtual exercise, employee health, physical activity, work stress

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1. Introduction

Workplace stress has consistently been understudied even though faculty and staff who work in a university setting live with this stress daily [1,2]. A recent survey of over 1100 university professors suggested that the evolving COVID-19 pandemic has exacerbated workplace stress levels and revealed about two-thirds of respondents reported feeling very stressed within the last year as a result of their work [3]. According to the World Health Organization workplace stress occurs when an individual's abilities to cope are challenged by incongruencies between their knowledge and abilities and the pressures and demands they experience from work [4]. There are multiple factors within the workplace that have an impact on workplace stress outside of basic demands and pressures of work, including sexual harassment and bullying [5]. While workplace stress does have negative mental health repercussions such as links to depression there are also physical health concerns associated with consistent

workplace stress like hypertension as well as increased risk of cardiovascular diseases such as coronary artery disease [5]. While there is consistent evidence about the negative impacts on physical and mental health influenced by workplace stress, not everyone experiences workplace stress in this manner. Recent research supports differences in factors affecting workplace stress between males and females [1]. Women report significantly more psychological strains (i.e., anger and frustration) than men as well as increases in experiences with depression, which could be a result of feeling uncomfortable in their role as well as in their work environment [1,2]. Women also acknowledge other aspects of their place within a university setting as sources of stress, including lack of support at work, work overload, and experiencing backlash for not fulfilling traditional feminine roles [1]. University presidents report that faculty and staff's mental health is the third most pressing issue they face, and they can help their faculty and staff cope and work through workplace stress and its effects by promoting health behaviors [6].

With stress being a primary concern in the workplace, promoting self-care and work-life balance is a necessary

step for university employees to excel in their roles [7]. Workplace stress is not the only concern, as most adults are missing out on health and wellness benefits due to lack of physical activity [8]. Health promotion programs in the workplace aim to increase physical activity in faculty and staff and help them to overcome previously perceived barriers including scheduling difficulty and lack of resources [9]. Successful worksite wellness programs require extensive resources for employees [9]. These unique resources are more readily available to faculty members in academia, as college campuses include refined walkways that are easily accessible and safe [9]. Fitness centers and physical fitness programs are examples of unique stress-reducing resources available to educators and employees in institutions [10]. For faculty members in higher education, health promotion programs are especially important in coping with modern stressors [7]. Butler and colleagues (2015) implemented a university worksite wellness program that utilized pedometers to track activities such as walking while also monitoring goals, weight, and blood pressure both at baseline and follow-up [9]. The study was successful, resulting in increases of both physical activity and step-count as well as slight improvements in body mass index and blood pressure [9]. Although the importance of direct health benefits is not to be dismissed, health promotion programs in the workplace benefit psychological well-being of employees as well. When following up with intervention participants, researchers found that job stress was reduced among faculty and staff in their workplaces significantly following workplace physical activity programs [8]. Treatment participants had lower absenteeism, improved life quality, and improved mood scores [8]. Workplace health promotion programs can help reduce workplace stress and improve workplace productivity, while being flexible to different forms of implementation.

University faculty and staff experience daily stressors such as lack of funding and resources, feelings of being overworked and job insecurity which can increase depression, job burnout, as well as cardiovascular disease and other physical health concerns [11,12,13]. Engaging in regular physical activity can help combat these harmful side effects of stress in a healthy manner. Studies have shown that those who participate in light to moderate physical activity not only have decreased levels of perceived stress and improved mental health, but also improvements in physiological health and a decreased risk of cardiovascular disease [14,15,16]. The Exercise is Medicine® On Campus (EIM-OC) program aims to encourage physical activity and the improvement of overall health and well-being of students, faculty and staff of universities globally [17]. University faculty and staff face busy schedules, daily stressors and long hours on campus, making them an ideal population to implement a workplace health promotion program aiming to decrease physical health risks and decrease stress. EIM-OC can be implemented in a variety of ways, including through virtual exercise classes for universities operating online due to the current pandemic.

As previously mentioned, the Coronavirus pandemic has added a new level of stress and increased feeling of job burnout among university faculty and staff [18]. 69% of faculty reported feelings of stress compared to 32%

reported in 2019, and about 55% have thought about making a career change or evoking early retirement [19]. Overwhelming stress has impacted female faculty members more so than men, with feelings of disproportionate work/life balance and increased workload [19]. Due to the nature of the pandemic and stay-at-home orders enforced by governments globally, a decrease in physical activity has been reported [20]. While the pandemic has challenged worksite health programs to be creative in their programmatic efforts (i.e., offering virtual and remote programs), there has been little research done on virtual physical activity classes, specifically on college and university campuses.

The purpose of this study was to evaluate the effects of EIM-OC virtual exercise classes have on stress levels and individual exercise behaviors of university faculty and staff. We hypothesized a decrease in perceived stress levels following participation in virtual exercise classes.

2. Methods

2.1. Exercise is Medicine on Campus Description

Exercise is Medicine on Campus (EIM-OC) was launched at California State University, Monterey Bay (CSUMB) in fall 2019. The initiative was launched and implemented by the university's Kinesiology department. Three Associate Professors, three student leaders, the campus health center Health Educator, and the Kinesiology (KIN) Department Chair acted as the Executive Board. Programs were designed and implemented for all CSUMB community members (staff, faculty, students). In the first semester, 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."

In March 2020, when the COVID-19 pandemic forced the closure of CSUMB and universities nationwide, all classes were quickly transitioned to remote learning. At the time, the EIM-OC program cancelled all in-person classes and began to work on also transitioning to virtual offerings. This included creating a YouTube channel with exercise videos and tips for working from home, a Strava-based "Run, Walk and Roll Club" and Zoom exercise classes. The YouTube Channel and Strava club were able to launch in late spring 2020 semester, with planning taking place for more fall 2020 programs, including exercise classes to be offered via Zoom.

The inaugural Zoom exercise class was "Virtual Circuit Training," scheduled twice a week, for six weeks in fall 2020. The class was publicized on the university dashboard of events, on the EIM-OC website, and through word of mouth from Kinesiology professors and other past participants. The class was facilitated by KIN majors who completed course work in personal training and strength and conditioning, and had attended an online orientation and training led by the faculty lead (who also supervised all classes). Classes were open to all CSUMB community members, since there were no space constraints.

The students designed each workout, which included a dynamic warm up, 7-8 exercises that were designed for each major muscle group, and a static stretching and deep breathing cool down. Most exercises were body weight, or participants could use resistance bands and dumbbells if they were available. Students also offered creative solutions for resistance including water bottles or cans. During the workout session, each exercise lasted 30 seconds, and participants would perform as many repetitions of the exercise as possible during the time allotment. Participants were encouraged to work within their own abilities and fitness levels, and student facilitators offered exercise modifications as needed. With transition and set up times, one circuit lasted approximately 12 minutes. Three sets of the circuit were performed during each class of 50 minutes.

2.2. Research Design

The research design was pre-post and tracked university employees who participated in the EIM-OC Virtual Circuit Training course. The Institutional Review Board at CSUMB approved this study and all participants electronically signed an informed consent and completed the Physical Activity Readiness Questionnaire (PAR-Q) [21] prior to receiving calendar invites with Zoom links.

2.2.1. Instrumentation

A Google Form questionnaire was administered one week prior to the beginning of the course, and the day following the end of the six-week course. The form included demographic questions for age, income, job position and ethnicity. The Godin Leisure Time Exercise Questionnaire (LTEQ) [22] and the Perceived Stress Scale (PSS) [23] were included in the Google Form questionnaire.

The LTEQ is a commonly used self-report tool to assess the amount of physical activity and intensity. Several validation studies support the use of the questionnaires classification system for healthy adults [24,25]. The PSS is a widely utilized instrument for

evaluating stress as perceived by an individual. Scores on the PSS have shown adequate internal consistency reliability, and moderate concurrent criterion validity [26].

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 Virtual Circuit Training course. Of the 42 class participants, 13 volunteered to participate in the study. Eight employees completed both surveys and were included in the statistical analysis. Mean age was 40.6 ± 11.6 years. Participants included 2 faculty and 6 staff members, and all identified as female. See Table 1 & Table 2 for ethnicity and income demographics.

Table 1. Participant Ethnicity

	N	%
Hispanic/Latinx	2	25
White	5	62.5
Other	1	12.5

Table 2. Participant Household Income

	N	%
\$60,000-69,999	1	12.5
\$100,000-149,999	6	75.0
\$150,000 or more	1	12.5

3. Results

The paired samples t-test indicated a significant difference in perceived stress $t(7) = 4.60, p < .002$ from pre ($M = 18.63, SD = 6.41$) to post ($M = 12.88, SD = 5.82$) virtual exercise classes.

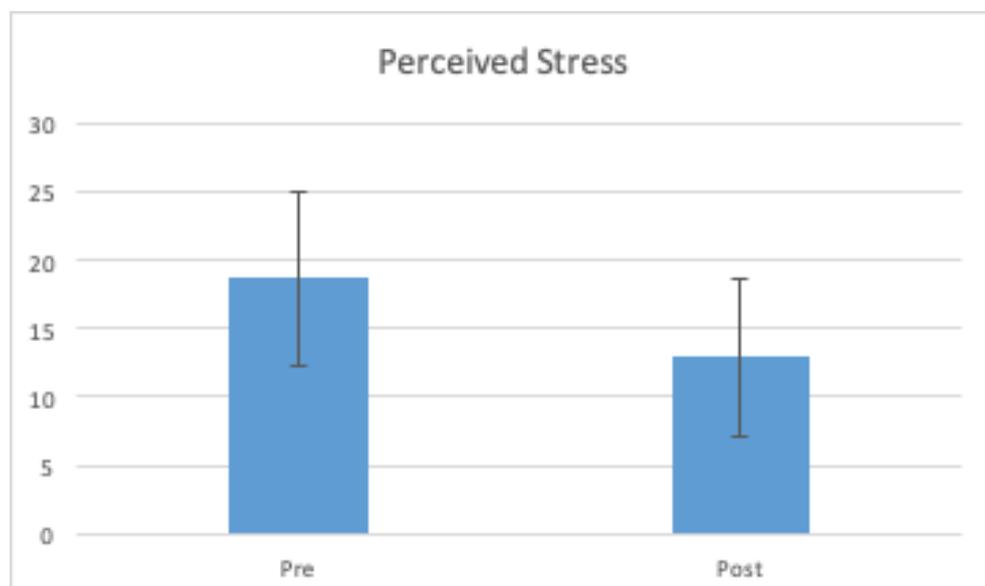


Figure 1. Perceived Stress Scale Scores ($p < .002$)

The Godin Leisure-Time questionnaire was also found to have a significant difference $t(7) = -3.38, p = .012$ from pre ($M = 12.91, SD = 2.81$) to post ($M = 15.9, SD = 3.3$) virtual exercise classes.

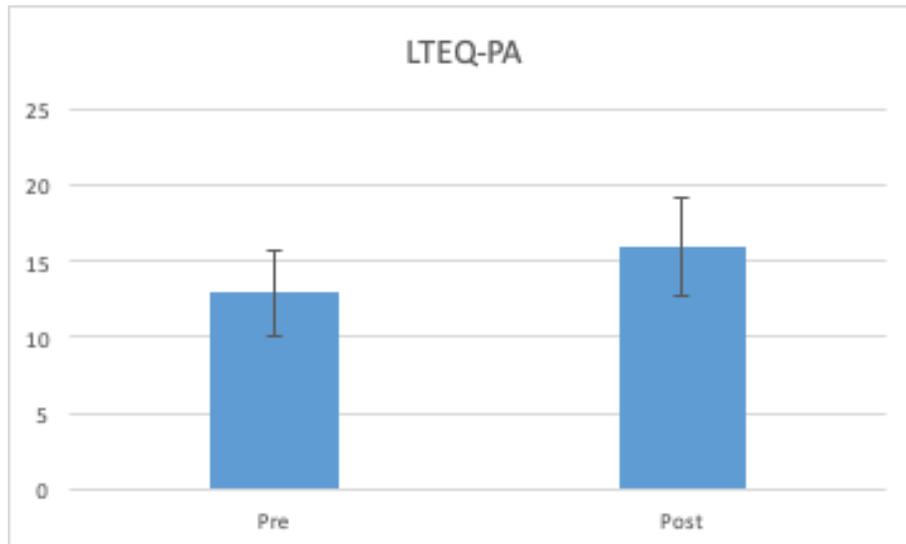


Figure 2. Leisure Time Physical Activity scores ($p = .012$)

Strenuous days of PA were not significant $t(7) = -1.82, p = .11$ from pre ($M = 13.5, SD = 15.2$) to post ($M = 20.25, SD = 16.49$) but trended toward an increase. Moderate days of PA were also not significant $t(7) = .00, p = 1.0$. Light days of PA were not significant $t(7) = -.97, p = .365$ but trended toward an increase from pre ($M = 10.88, SD = 5.3$) to post ($M = 13.13, SD = 7.34$) virtual exercise classes.

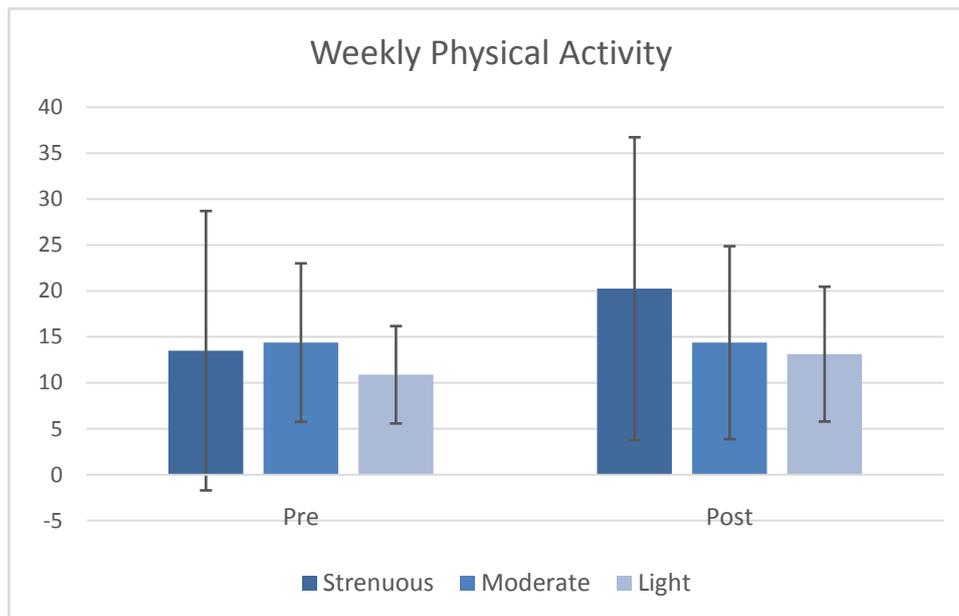


Figure 3. Strenuous, moderate and light intensity physical activity days per week ($p = .11$)

4. Discussion

The purpose of this study was to investigate the effects of virtual exercise classes on perceived stress levels in university faculty and staff. The hypothesis stated perceived stress levels would decrease following a virtual exercise program. The results supported the hypothesis with perceived stress levels significantly decreasing after completion of the six-week virtual exercise program. The total amount of weekly physical activity also increased significantly following the training. Strenuous, moderate and light physical activity were not statistically significant, but all trended toward an increase.

These results are consistent with previous research regarding the positive outcome of workplace health promotion programs [7,8,9]. Previous studies showed a similar decrease in perceived stress levels following participation in physical activity [8,9,14,15]. These results are also consistent with previous studies finding an increase in physical activity levels after completion of a worksite physical activity program [9]. These findings give further evidence of worksite wellness programs working to promote self-care and physical activity in university faculty and staff as an important part of success in this industry [7]. These findings advance the literature by suggesting that exercise programs, when offered

virtually, can be effective in reducing perceived stress levels among employees. Stay-at-home orders have resulted in many employees working from home which not only comes with a unique set of stressors but also limits accessibility to exercise facilities. These findings suggest that worksite health promotion programs can offer accessible virtual exercise classes to help decrease perceived stress and increase overall weekly physical activity for employees working from home.

Regular physical activity participation has been shown to decrease stress and improve psychological and physiological health [14,15,16]. These trends continued in the present study as perceived stress decreased following virtual exercise classes. Workplace health promotion programs provide psychological benefits and well-being, as job stress is reduced and the amount of physical activity increases. Properly implemented workplace wellness programs are likely to result in increase in physical activity [9]. In the current study, physical activity significantly increased following virtual exercise classes. Previous research suggests that increased physical activity can help combat the negative effects of job stress. The present results of significantly less perceived stress could be due to increased physical activity provided by the virtual exercise classes. Because participants in the study engaged in increased amounts of physical activity from pre to post intervention, stress was significantly reduced as a result.

While perceived stress reduction from pre to post intervention may be explained by increases in physical activity, the strenuous and light days of physical activity only trending toward an increase could be a result of sample size. Different intensity levels in the study were likely limited by the small size of the sample. Because of this limitation, intensity levels cannot necessarily be a precise representation of the population. While 42 participants (i.e., faculty, staff, and students) were part of the virtual training course, only 13 volunteered to be part of the study, and only eight of those 13 could be included for data analysis since we were only interested in studying faculty and staff; not students. Because of the trend toward an increase for both strenuous and light days of physical activity, perhaps a larger sample size would result in significant increases in both. Another potential limitation to this study could be the research design, in that there was not high interest in participating in the surveys. One suggestion for future replicated studies could be including incentives to participate in the study, therefore increasing sample size, and potentially increasing the number of significant results.

Research to further investigate the effects of virtual physical activity on workplace stress in university faculty and staff is necessary. Future studies should include a larger sample size to further investigate the relationship. Due to this sample being solely women, future research should include more than just those who identify as female and could focus on gender differences in workplace stress reduction and inclusion in worksite health promotions. Finally, future designs could include a longer testing period in order to maximize the university workplace health promotions.

5. Conclusion

Findings from the present study help to inform practical implications within the field of EIM-OC. Findings show that even with reported increases in stress and burnout, participation in virtual exercise programs are effective tools to help university faculty and staff counteract at least some of the added stress brought on by the pandemic [18,19]. Findings also suggest that even though the pandemic resulted in many having to stay home due to stay-at-home orders put into place by governments around the globe, virtual exercise programs can be an effective way to encourage physical activity while working from home. Making exercise programs available to faculty and staff at home serves as an effective, direct response to the reported decrease in physical activity because of the pandemic [20].

Independent of a global pandemic, the findings from this study also help those who lack direct access to fitness centers as well as those who do not have time to attend scheduled in person exercise classes. University faculty and staff already consistently report feeling overworked which can lead to increases in stress, and consistent light to moderate physical activity has been shown to be an effective way to work against stress [11-16]. Showing that virtual exercise programs are effective in helping significantly decrease stress levels can help universities encourage their faculty and staff to participate in the programs whenever they have the opportunity. Whether that opportunity be at home, in a hotel room for a conference or simply whenever they have free time available universities can be confident that they are encouraging their faculty and staff to participate in programs that are shown to have benefits. Also, the use of virtual exercise programs as a tool of EIM-OC campuses has not been investigated, and the present study provides evidence that virtual exercise programs on EIM-OC campuses can be effective in promoting physical activity among faculty and staff.

In conclusion, the purpose of this study was to evaluate the effects of EIM-OC virtual exercise classes on stress levels and individual exercise behaviors of university faculty and staff and found that after a six-week virtual exercise program, participants reported significant decreases in perceived stress levels.

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Statement of Competing Interests

The authors have no competing interests.

Abbreviations

EIM-OC: Exercise is Medicine on Campus, ACSM: American College of Sports Medicine, PA: physical activity, CSUMB: California State University-Monterey Bay, KIN: Kinesiology, PAR-Q: Physical Activity Readiness Questionnaire, PSS: Perceives Stress Scale, LTEQ: The Godin Leisure Time Exercise Questionnaire

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