

A Multicomponent Workplace Environmental Intervention to Promote Physical Activity among the Staff of Universiti Malaysia Sarawak

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Abstract

Background: Physical inactivity is a significant public health issue affecting working adults because it can increase the risk of noncommunicable diseases. **Objectives:** The objective is to determine the outcomes of a multi-component workplace environmental intervention that incorporated physical activity self-regulation (PASR) to promote physical activity (PA) among employees. **Materials and Methods:** This was a 6-month intervention with a two-group, parallel, quasi-experimental study. A total of 11 workplaces were randomly assigned to intervention group (IG) or control group (CG) using a 1:1 allocation ratio. In each group, 84 eligible participants were recruited. The IG was exposed to the organizational support and the PA support components throughout the study. The PASR Scale, International PA Questionnaire, and pedometer were used to measure the outcome at the baseline, 3rd-month, and 6th-month follow-ups, respectively. The repeated measures-analysis of variance analysis was used to determine the changes in the PASR skills, MET-min/week, and step/week over time. **Results:** The IG had 75 participants (51 females and 24 males) and the CG had 73 participants (52 females and 21 males) at the 6th-month follow-up. Despite there was no statistically significant difference in the outcomes between groups over time, the IG showed significant improvements in total PASR ($\eta_p^2 = 0.021$), goal setting ($\eta_p^2 = 0.024$), total MET-min/week ($\eta_p^2 = 0.031$), housework-related PA ($\eta_p^2 = 0.101$), and step/week ($\eta_p^2 = 0.827$) throughout this intervention. **Conclusion:** This intervention was found to be effective in improving the PASR skills, MET-min/week, and step/week of IG participants. Meanwhile, because some effect sizes were small, these findings should be interpreted with caution.

Key words: Environmental intervention, multi-component, physical activity, self-regulation, workplace

INTRODUCTION

One-third of Malaysian working-aged adults were physically inactive.^[1] Physical inactivity increases the risk of cardiovascular diseases, diabetes, and cancers.^[2] Cochrane reviews demonstrated that the effects of a single-component physical activity (PA) intervention program were less likely to sustain unless the intervention included other components that allowed participants to continue participating after the program had ended.^[3] Therefore, multi-component environmental interventions to promote PA are being advocated to increase PA by increasing awareness of the importance of PA, increasing access to PA, improving PA self-regulation (PASR), and optimizing social norms on PA.^[4,5] This approach offered the participants greater flexibility and comprehensiveness in the workplace health promotion programs (WHPPs), which potentially led to greater engagement and long-term PA behavior change.^[3] The purpose

of this study is to determine the outcomes of a multi-component workplace environmental intervention that incorporated PASR to promote PA among UNIMAS staff.

MATERIALS AND METHODS

Trial design

This intervention was conducted at UNIMAS, a public university in Kota Samarahan, Sarawak, Malaysia, using

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a 6-month, two-group, parallel, and quasi-experimental design. Eleven of the 15 eligible workplaces on campus, characterized by three-story buildings with at least four main staircases and predominantly white-collar employees aged 20–60 years, participated. Participants were recruited voluntarily, not through random sampling. The intervention was based on multi-component workplace environmental strategies to promote PA, as guided by existing literature.^[6] Throughout the 6 months, the intervention group (IG) received both PA support and organizational support components intervention, while the control group (CG) maintained their regular routines. The study also incorporated PASR to empower participants to self-regulate their PA. Assessments were conducted at baseline (T0), mid-intervention (T1), and postintervention (T2), gathering data on PASR, MET-min/week, and total step/week.

Participant

White-collar employees aged between 20 and 60 years old were included in this study. Those who worked from home regularly (more than 2 days/week), planned to take a long leave (more than 2 weeks), or participated in another fitness program during the study were excluded. Those with any physical disability or medical condition that prevented them from engaging in PA were also excluded.

Intervention

A 30-min face-to-face preintervention briefing session was given to the IG. The six PASR strategies were highlighted in the briefing session. Participants were taught to set challenging but achievable goals (such as 50,000 step/week and 600 MET-min/week) and to believe in their capability to execute the PA behavior to achieve their goals.^[7] In addition, they were requested to self-monitor their daily step with pedometers.^[8] Moreover, they were informed that the posters contained time management tips and suggestions to empower them to self-manage their PA time,^[9] such as less sitting down and exercising while watching TV. Furthermore, they were encouraged to use social support to optimize their PA behavior,^[10] for instance, to ask their friends or experts for PA support and advice. To prevent relapse, they were also encouraged to engage in PA (such as parking farther away or choosing active commuting) when they were away from home, and to work out at home (e.g. planks, push-ups, and squats) when the weather is bad.^[9] In addition, those who achieved 50,000 step/week received a certificate to reinforce their PA behavior.

Following the briefing session, the IG received both the organizational and the PA support component intervention throughout the study. The environmental assessment tool (EAT) was used as a checklist to assess workplace environments systematically at each time point. It is a validated and well-established tool with good inter-rater reliability between 0.83 and 0.97.^[11] According to Watanabe and Kawakami (2018), the EAT scores increased by nine points or more, indicating that the environment to promote PA has been operationally improved.^[5]

The organizational support component included written policies, health education (12 short videos promoting PA), and stretching exercises (five short videos promoting X-break) in the workplace. These contents were taken from the “*Info Sihat*” official website,^[12] and PA guidelines.^[13] These videos were uploaded to Google Drive and the link was provided to the participants so that they could watch the videos whenever and wherever they wanted, which was more convenient because most participants could not attend health education sessions during office hours. Furthermore, virtual step challenges were organized at the T1 and T2 and those who achieved more than 50,000 step/week were rewarded with a certificate as recognition.

For the PA support component, posters and banners promoting PASR strategies and PA were displayed in the common areas throughout the IG workplaces such as at the entrance (counter), in the office, pantry, next to the water dispenser, bulletin board, corridor, or toilet. The contents of the posters and banners were taken from guidelines and previous interventions promoting PA in adults.^[9,13,14] In addition, there were posters to encourage cycling on campus and parking farther away from the workplace. In addition, the point-of-decision prompts were placed in front of the elevator to encourage the staff to take the stairs. Furthermore, posters encouraging participants to use the campus sports center were displayed at the entrance of the building.

Outcomes measurement

The PASR-12 Scale was used to determine six strategies used by participants to engage in PA. This self-administered questionnaire consisted of 12 items (5-point unipolar Likert Scale) with internal consistency reliability between 0.79 and 0.95.^[15] For each item, the scores can be rated from “1 = never; to 5 = very often.” The scores of each strategy were calculated by summing the respective items: self-monitoring (items 1, 2), goal setting (items 3, 4), social support (items 5, 6), reinforcements (items 7, 8), time management (items 9, 10), and relapse prevention (items 11, 12). A higher strategy score indicates that the participant used that strategy more frequently to engage in PA. Moreover, a higher total PASR score indicates that the participant has a higher PASR for self-regulating their PA.

The International PA Questionnaire (IPAQ) long form was used to determine the participant MET-min/week in this study. This self-administered questionnaire consisted of 27 items with an overall test-retest reliability of 0.80.^[16] The IPAQ was used to measure the intensity, duration, and frequency of PA over the previous 7 days in four domains of daily living activity: work-related, transportation-related, housework-related, and leisure-time PA. The intensity, duration, and frequency of PA in the same domain were then calculated and summed to determine the MET-min/week in that respective domain. Finally, the total MET-min/week was determined by summing the MET-min/week from all four domains.

The Omron piezoelectric pedometer (HJ-105), a low-cost, compact, valid tool^[17] with an intra-model reliability of 0.99,^[18]