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The active workplace study: Protocol for a randomized controlled trial with sedentary workers

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ABSTRACT

Objectives: Sedentary behavior is pervasive in the workplace and is harmful to health. Research on the effectiveness of comprehensive workplace interventions to reduce sedentary behavior and improve worker health and safety is crucial as sedentary jobs become more common.
Methods: We developed a *Total Worker Health* intervention targeting sedentary behavior in call centers, and are evaluating intervention effectiveness in a randomized controlled trial. Four worksites will be randomly assigned to an intervention or control condition. The intervention condition includes the provision of active workstations along with programs and procedures at environmental, organizational, and individual levels. Control worksites will receive active workstations with no additional support, following common organizational practices.
Results: Outcomes include objectively measured physical activity, biological markers of health, and self-report survey data at baseline, after the 6-month intervention or control period, and at a 12-month follow-up.
Conclusions: The aims of the study are to determine whether a *Total Worker Health* intervention has stronger impacts on workplace sedentary behavior, uninterrupted bouts of sitting, and worker health and safety compared to a usual practice control condition. The study will inform future workplace sedentary behavior intervention and dissemination research, along with organizational best practices for reducing sedentary behavior in the workplace.

1. Introduction

Sedentary behavior, defined any waking behavior with energy expenditure ≤1.5 metabolic equivalents, while in a sitting, reclining or lying posture [1], remains pervasive at work, during transportation, and during leisure time [2,3]. Sedentary behavior, and specifically uninterrupted bouts of sitting, are related to adverse outcomes including increased risk of type 2 diabetes [4,5], musculoskeletal pain and injury [6], cardiovascular disease, and all-cause mortality [7]. Meanwhile, sedentary jobs are increasingly common. There are currently over 30 million sedentary workers in the United States alone [8,9]. On average employed people spend more than 7.5 h working per day [10], making the workplace a significant source of exposure to sedentary behavior and uninterrupted bouts of sitting. Effective methods for reducing these hazards are important for improving worker health, safety, and well-being.

Several studies have evaluated methods to reduce sedentary behavior and uninterrupted bouts of sitting in the workplace. The most common intervention approach is to provide employees with sit/stand desks or active workstations without additional support, which has been shown to reduce sedentary time but does not impact biological markers of health [11–16]. Multicomponent interventions have produced comparably favorable results [15–20]. However, effectiveness research on comprehensive workplace interventions is still lacking, along with applied research that impacts health outcomes [16,21].

Total Worker Health® (*TWH*) is a holistic approach to worker

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wellbeing developed by the National Institute for Occupational Safety and Health, defined as "policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being" [22]. The *TWH* approach prioritizes changes in the environment and organization of work, and *TWH* interventions are more effective than traditional approaches at improving worker health and safety [23,24]. Workplace sedentary behavior interventions grounded in the *TWH* approach may therefore be more effective at improving worker health and safety than previous approaches.

To our knowledge, there is only one published *TWH* intervention targeting sedentary work [25]. This study compared the effects of an ergonomic workstation optimization intervention to a *TWH* condition that combined ergonomic optimization with access to pedal stand active workstations. Results revealed an increase in overall movement and time in light intensity physical activity during work hours in the *TWH* condition. Study limitations included the lack of a control group, a small sample size ($N = 54$), and a lack of follow-up testing to determine whether the approach was sufficient to create long-term changes.

Another gap in workplace sedentary behavior research is experimentally linking workplace standing and physical activity to physiological health outcomes. Epidemiological and correlational evidence links sedentary behavior and prolonged sitting with detrimental physiological and health outcomes (e.g., [4,5,26–37]), and acute experimental studies have shown improvements in vascular function and glucose processing when periods of prolonged sitting are interrupted (e.g., [36–39]). However, to our knowledge only two studies have measured the long-term impact of a worksite intervention on blood glucose [17,40], and no prospective sedentary behavior interventions have measured impacts on vascular functioning. Filling these measurement gaps will help researchers and practitioners develop strategies that have the greatest long-term impacts on worker health.

To address gaps in workplace sedentary behavior intervention research and inform workplace practices, we developed the Active Workplace intervention for call center workers. The intervention applies the *TWH* approach, provides workers with activity permissive workstations, and includes a comprehensive set of programs and practices. The intervention focuses on call center employees because they are among the most sedentary workers in the U.S., sitting for up to 83% of work hours [41], and they generally lack autonomy of physical movement at work. The effectiveness of the Active Workplace intervention will be evaluated in the Active Workplace Study, and the purpose of this paper is to describe the Active Workplace Study methods, rationale, and study design.

2. Material and methods

2.1. Overview and organizational inclusion criteria

The Active Workplace Study (ClinicalTrials.gov identifier NCT03556670) is a randomized controlled trial evaluating the efficacy of a 6-month intervention for call center workers, comparing control and intervention conditions. Worksites in the control condition will receive activity permissive workstations but no additional program support, following the common practice of employers solely providing access to health or safety resources. The study will therefore evaluate whether it is sufficient for organizations to provide activity permissive workstations, or if it is beneficial for organizations to provide additional support to encourage adoption and long-term use of these resources. We hypothesize that providing additional support through a *TWH* approach will have a stronger impact on sedentary behavior, health, safety, and well-being compared to providing active workstations alone. The study was approved by the Oregon Health & Science University Institutional Review Board.

Four call centers will be randomly assigned to an intervention condition or control condition prior to participant enrollment, and all employees within a worksite will be in the same experimental condition. Organizations and participants will be blind to their experimental condition. In order to participate in the study, a call center is required to have existing sit-stand desks for all employees, an organizational structure where a supervisor oversees a team of approximately 12–20 individuals with workstations in close proximity to each other, and enough employees to meet recruitment goals based on a priori power analysis. While recruitment will not focus on a specific industry, participant recruitment goals will necessitate organizations with larger call centers, like public utilities, cable and internet service providers, and cellular communications companies. Emergency call centers will not be included due to the differences in organization of work.

2.2. Study timeline

Participation for organizations in both conditions spans 12 months. Organizations will complete participant enrollment and baseline data collection, post-intervention data collection after a 6-month intervention or control period, and follow-up data collection at 12 months. Activity permissive workstations will be distributed to each worksite following baseline data collection, which initiates the 6-month intervention or control period. Participants will be removed from the study if they leave the participating organization, and participants can withdraw from the study at any time.

2.3. Activity permissive workstations

All intervention and control worksites will receive pedal stands (DeskCycle; 3D Innovations, LLC, Greeley, CO) after completing baseline data collection (See Fig. 1). Pedal stands were chosen because they allow for physical activity while working, as opposed to just the ability to alternate between sitting and standing offered by sit-stand desks, without interrupting worker productivity. Activity permissive workstations also have greater potential to impact physiological outcomes in comparison to sit/stand desks alone. The number of pedal stands distributed to each organization will be based on the number of people that enroll in the study (about one pedal stand for every 4 study participants). The use of pedal stands is completely voluntary in both conditions. A Fitbit Zip (Fitbit, Inc., San Francisco, CA) will be attached to a pedal on each pedal stand to measure pedal stand use. Worksites will be given laptops with Fitbit software to upload pedaling data, allowing researchers to access pedaling data remotely and provide feedback for team pedaling competitions in the intervention condition.

2.4. Intervention

The guiding framework for the intervention is the *TWH* approach, which is applied by altering the workplace environment, introducing organizational practices to promote health and safety, and integrating hazard protection and health promotion in a comprehensive program.

Fig. 1. Deskcycle pedal stand.

The intervention is also informed by the ecological perspective of health promotion [42], including strategies designed to impact the interpersonal and organizational/environmental levels by adding health and safety resources and the changing the ways that supervisors interact with employees about safety, health, and well-being. The intervention is further informed by the social cognitive theory of self-regulation [43], including strategies such as goal setting and behavioral self-monitoring that can impact intrapersonal factors (e.g., self-efficacy, evaluative self-reactions), and strategies such as training and health and safety discussions that can impact interpersonal factors (e.g., social support, performance references).

The comprehensive, 6-month intervention utilizes recurring activities focused on a new health and safety topic each month: sedentary behavior; ergonomics and injury; stress management; physical activity; sleep hygiene; and nutrition. The recurring activities include organizational level components (health and safety messaging, scripted supervisor-led discussions, supervisor training) and individual components (computer-based training, goal setting, behavioral self-monitoring, team competitions). All intervention components have been successfully implemented in previous interventions [44–46] and are tailored to the call center environment for this study (see Table 1).

2.4.1. Study website

A website was developed [47] where participants in the intervention condition will complete all computer-based training and behavioral self-monitoring, and supervisors will record inter-supervisor observations. Researchers will use the website to track intervention participation and send study reminders.

2.4.2. Supervisor training and inter-supervisor observations

During the baseline enrollment period, supervisors will be asked to complete a computer-based training (cTRAIN software; NWETA, Lake Oswego, OR), accessed through the study website. The training provides information about sedentary behavior, the *THW* approach, how *TWH* oriented interactions and family supportive interactions with employees can benefit employee health and safety [48,49], and how to apply these principles in the workplace. Following the training, supervisors will set a behavioral goal for *TWH* and family supportive interactions with employees and track their behavior towards that goal for two weeks.

Supervisors will also be asked to participate in inter-supervisor observations after completing the supervisor training. Researchers will send supervisors an email poll via the study website three times per week for the two weeks following completion of the supervisor training. The poll will ask how many times they have seen or heard another supervisor having a *TWH* or family supportive interaction with an employee since the last email poll. Group level feedback on the cumulative frequency of supportive interactions will be displayed every time a supervisor completes the poll.

2.4.3. Computer-based training

We developed seven computer-based training units, presented with cTRAIN software and accessed through the study website. Participants will be asked to complete a study orientation and *TWH* introduction training during baseline enrollment, and then complete one training during each of the six intervention months, aligning with each monthly health and safety topic. Each training includes three sections: 1) information about the monthly health and safety topic, 2) information on how the workplace influences that topic, and 3) strategies to improve health and safety related to the topic. Trainings are interactive, display immediate feedback, and require mastery of the information. They are self-paced but designed to be completed in 15 min. Topic knowledge will be evaluated with pre- and post-test questions in each training. Participants will receive a $40 incentive if they complete all 6 trainings.

2.4.4. Goal setting and behavioral self-monitoring

After completing each computer-based training, participants will be

Table 1
Active workplace intervention components.

Intervention level	Component	Description
Environmental	Sit/stand desks	Organizational inclusion criteria includes that all employees have sit/stand desks. These desks give employees the opportunity to alternate between sitting and standing throughout the workday.
	Pedal stands	Organizations in both conditions will receive pedal stand active workstations (DeskCycle). Use is voluntary.
Organizational	Health and safety messaging[a]	Two poster designs for each health and safety topic will display reminders to engage in activities that promote health and safety. These posters will be distributed throughout the workplace at the beginning of each intervention month.
	Scripted supervisor-led discussions[a]	A one-page scripted discussion will be providfed for each health and safety topic. The front includes an illustration and key takeaways. The back includes educational safety and health information followed by discussion questions. Each discussion is designed to be completed in 10 to 15 min.
	Supervisor training and behavior tracking	During the baseline enrollment period, supervisors will be asked to complete a computer-based training about sedentary behavior, *TWH*, how *TWH* oriented interactions and family supportive interactions with employees can benefit employee health and safety, and how to apply these principles in the workplace. Following the training, supervisors will be asked to set a behavioral goal for *TWH* or family supportive interactions with employees and track their behavior two weeks on study website.
	Inter-supervisor observations	For two weeks following completion of the supervisor training, supervisors will be sent a poll three times per week through the study website. The poll asks supervisors how many times they observed another supervisor providing *TWH* support or family support for employees since the last poll. Group level feedback on the cumulative frequency of each type of support will be displayed.
Individual	Computer-based training[a]	We created 7 computer-based trainings, which are presented with cTRAIN software and accessed through the Active Workplace Study website (www.activestudy.org). The first training is an orientation to *TWH* completed during enrollment. The following 6 trainings will be completed once per month and aligned with the monthly health and safety topics. Each training includes three sections: 1) information about the topic, 2) information on how the workplace influences that topic, and 3) strategies for improving health and safety related to the topic. The trainings are self-paced and designed to be completed in 15 min.
	Goal setting and behavioral self-monitoring[a]	Upon completing a computer-based training, participants will be presented with two goal setting options related to the training topic. They will be asked

(*continued on next page*)

Table 1 (*continued*)

Intervention level	Component	Description
		to set a goal, then observe and track their behavior daily over the following two weeks. Daily and total progress towards their goal is displayed on the study website.
	Team competitions	Participants will be organized by pre-existing teams (a supervisor and their direct reports) and asked to participate in two month-long pedaling competitions using the pedal stands during months one and four of the intervention. Team mileage will be measured by a Fitbit attached to each pedal stand. Weekly mileage totals for each team will be calculated by the research team, plotted on a map following a scenic route in Oregon, and reported to participants. Incentives will be provided for the winning team and for each team that surpasses a mileage threshold.

[a] Recurring activity - the 6-month intervention includes recurring activities focused on a monthly health and safety topic: sedentary behavior, ergonomics and injury, stress management, physical activity, sleep hygiene, and nutrition.

presented with two behavioral self-monitoring options related to the training topic. Participants will be asked to set a goal and track their behavior on the study website each day for two weeks. The website will display individual level feedback to help develop motivating discrepancies [43]. Participants will receive a $10 incentive for each month in which they submit 4 or more behavior tracking logs (up to $60 total).

2.4.5. Health and safety messaging

For each monthly health and safety topic we designed two posters to promote health and safety, which correspond with the monthly behavioral self-monitoring activities. These posters will be distributed to the two intervention worksites, and worksites will be asked to hang the relevant posters throughout the work environment at the beginning of each intervention month.

2.4.6. Scripted supervisor-led discussions

We developed one scripted supervisor-led discussion for each month of the intervention. Each discussion is one page and is designed for the supervisor to hold so employees can see a health or safety illustration on the front while the supervisor reads from the back (see Fig. 2). Content includes educational safety and health information followed by a guided team discussion, and they are designed to be completed in 10 to 15 min. Supervisors will be asked to complete these discussions with employees during regular team meetings.

2.4.7. Team competitions

Naturally occurring teams (a supervisor and their direct reports) within each intervention worksite will participate in two month-long competitions during the first and fourth months of the intervention, using the pedal stand active workstations. Fitbits attached to each pedal stand will be used to determine miles pedaled per team, adjusted by team size. The research team will collect pedal stand data weekly, plot each team's progress on a map following a scenic route in Oregon, and email participants weekly competition feedback. The winning team will receive a trophy, and gift baskets will be given to each team that surpasses a mileage threshold to encourage all teams to participate even if their team falls behind in the competition.

2.5. Data collection

Each of the three data collection periods (baseline, post-intervention at 6 months, and follow-up at 12 months) involves a survey, a physical health assessment with researchers, and wearing an accelerometer while at work for one week. We will also recruit a subsample of participants (the first 15 participants to volunteer at each worksite) to complete a measure of vascular endothelial function using a noninvasive finger test. Participants will receive a $30 incentive upon completing each measurement period and an additional $15 for completing the measure for vascular endothelial function.

2.5.1. Survey

Participants will be asked to complete a survey, administered via Survey Gizmo, prior to meeting researchers for a physical health assessment. The survey for each data collection period includes measures of exercise [50], sleep [51,52], stress [53,54], supervisor support [49,55], work-family conflict [56], musculoskeletal pain [57,58], injury

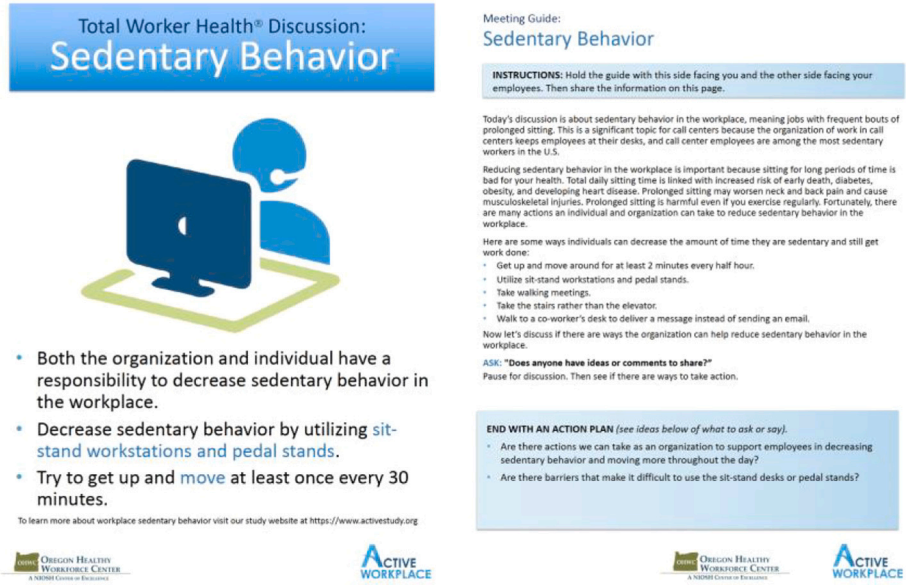

Fig. 2. Supervisor-led Scripted Discussion.

and illness [58], occupational sitting and physical activity [59], safety [60], job satisfaction [61], turnover intentions [62], health [63], eating habits [64], depression [65], alcohol and tobacco use, and demographics. The post-intervention and follow-up data collection surveys also include intervention reaction measures and feedback questions.

2.5.2. Physical health assessment

Participants will meet with researchers during each data collection period to complete a physical health assessment, which includes measures of height and body weight to calculate body mass index, percent body fat, resting blood pressure, resting heart rate, and hemoglobin A1c. A subsample of participants will also complete a measure for vascular endothelial function. Participants will receive their individual results at the end of each physical health assessment along with an explanation of desirable ranges for each measure.

Height will be measured to the nearest 1/8th of an inch with a stadiometer (seca, model 213; seca, Hamburg, Germany). Body weight and percent body fat will be measured with a body composition analyzer (Tanita, model TBF-310; Tanita Corporation, Tokyo, Japan). If a participant is pregnant or wearing a pacemaker, only weight will be measured. Resting blood pressure and resting heart rate will be measured by a single reading with a digital blood pressure monitor (OMRON, model HEM-907XL) after a participant sits resting for at least 1 to 3 min. Participants will be asked to sit comfortably with their back and arms supported, legs uncrossed, feet flat on the floor, and to not talk during the measurement.

Hemoglobin A1c will be measured using the DCA Vantage Analyzer (Siemens AG, Munich, Germany; precision coefficient of variation $\leq$2%, NGSP certified method [66]). Blood samples will be collected from a participant's third or fourth finger, with the first drop of blood removed with gauze before the blood sample is collected. All hemoglobin A1c measures will be analyzed immediately.

Vascular endothelial function will be measured with hyperemia peripheral arterial tonometry (EndoPAT and EndoPAT 2000 software, Itamar Medical Ltd., Caesarea, Israel). Participants will be asked to fast for at least four hours, abstain from tobacco and caffeine for at least eight hours, and abstain from vigorous exercise for at least twenty-four hours prior to completing the measure. Sensors will be placed on the participant's index fingers and the blood pressure cuff for occlusion will be placed on the non-dominant arm unless the participant expresses a need to have the cuff on their dominant arm. A baseline value will be recorded for five minutes, then the cuff will be rapidly inflated to 60 mmHg above systolic blood pressure (with a minimum pressure of 200 mmHg, and maximum pressure of 300 mmHg). After five minutes of occlusion, the cuff will be rapidly deflated and five minutes post-occlusion will be recorded. The release in the cuff leads to reactive hyperemia, which is measured as change in peripheral arterial tone using arterial pulsatile volume changes at the finger. Lower scores indicate a reduced vascular hyperemic response, and this method has shown 80% sensitivity and 85% specificity in identifying coronary endothelial dysfunction [67].

2.5.3. Accelerometry

At the end of the physical health assessment participants will be given an accelerometer (ActiGraph GT9X Link; ActiGraph LLC, Pensacola, FL) and asked to wear the accelerometer on their non-dominant thigh, during work hours only, for one week (five workdays). Non-work hours are excluded because the intervention targets and primary study outcomes are physical activity and sitting/standing at work, and we anticipate higher wear time compliance if participants do not take devices home at night (physical activity outside of work will be assessed via survey). Adjustable elastic bands with plastic buckles will be used to affix devices to participants' thighs. Thigh placement allows for a suitable combination of accuracy in classifying posture and physical activity [68–70]. Accelerometers will be set to a sample frequency of 60 hertz and an epoch length of 60 s. Data collection on each device will begin at midnight the day after the participant completes their physical health assessment.

ActiGraph GT9X Link data will be processed with ActiLife software. Wear time will be validated using methods previously published [71]. There is limited published research on wear time validation for thigh placement, and this validation algorithm was chosen over more recently developed algorithms [72] because we found it to be accurate during internal testing, and all ActiGraph devices are backwards compatible with previous algorithms. All wear time will be checked manually to ensure that analyses only include work hours, and will be adjusted to include only the first five full days of data (defined as 6 or more hours) for each participant. Physical activity and sedentary behavior will be scored using Freedson Adult (1998) criteria, which distinguishes between light physical activity and sedentary activity. To analyze uninterrupted bouts of sitting, we will operationally define an uninterrupted bout as a minimum of 20 min of consecutive sitting, and also use bout lengths of increasing durations (i.e., 30 min, 40 min, etc.) to examine dose-response effects. Number of uninterrupted sitting bouts and total time in uninterrupted sitting bouts will be analyzed, both standardized by minutes of wear time. Percent time stepping, sitting/lying, and standing will be calculated by dividing total minutes in these activities by total minutes of validated wear time.

2.6. Outcomes

The primary criteria for determining intervention efficacy will be differences in objectively measured sedentary behavior (percent time in sedentary activity) and physical activity (percent time in light and moderate activity) at work. Using accelerometer data we will also objectively analyze sitting time, standing time, pedaling time, and frequency and duration of bouts of uninterrupted sitting. We will supplement accelerometer measures with the Occupational Sitting and Physical Activity Questionnaire [59]. We will use Fitbits attached to the pedal stand active workstations to objectively measure worksite-level frequency and duration of pedal stand use throughout the intervention and follow-up periods. Other primary outcomes include musculoskeletal pain, and days lost due to illness and injury. Secondary outcomes include survey measures, biological markers of health (body weight, percent body fat, resting heart rate, resting blood pressure, hemoglobin A1c, and vascular endothelial function), and knowledge gains among intervention participants using pre- and post-tests in each computer-based training. We will use demographics and background information to describe the sample and measure factors that could relate to study outcomes, or potential confounding variables. We will also collect and analyze intervention fidelity and process measures (such as trainings completed, supervisor-led scripted discussions completed, behavioral self-monitoring completed) and intervention feasibility and acceptability measures (quantitative and qualitative).

2.7. Sample size and power

A power analysis for a repeated measures model examining the interaction of time*intervention was conducted using G*Power 3.1.9.4 [73] based on primary outcome measures. Previous sit/stand and active workstation interventions have produced relatively large effect sizes [74] for measures such as reductions in sitting time and sedentary behavior (d range 0.80–1.2; [11,13]. Because we are making environmental alterations in the control condition, we expect small changes in post-intervention outcomes (d = 0.20) in this condition. For power analyses we therefore used a conservative between group effect size estimate of d = 0.20 (equivalent f = 0.10). We estimate that the correlation between time points of the dependent variable will be 0.70 or higher. Based on these estimates and accounting for 10% attrition at each time point, a sample size of at least 148 (n = 74 in each condition) will provide sufficient power (0.80) to detect group by time interactions for primary outcomes at both post-intervention and follow-up

measurements. While n = 74 in each condition is a minimum enrollment target, we will increase recruitment goals based on organizational turnover rates to attain a predicted minimum sample of $n = 60$ in each condition at 12-month follow-up to achieve 0.80 power at that time.

2.8. Participant recruitment and enrollment

The research team will meet with upper management and supervisors at each worksite to explain the study and relevant intervention components. Supervisors will be given recruitment flyers, which will contain information about how to contact the research team and enroll in the study, and asked to distribute them to employees on their teams. The research team will meet with interested employees to explain the study, answer questions, and review the consent form. All call center employees, including upper management and supervisors, will be eligible to participate. All supervisors who enroll will be asked to complete the supervisor training, along with the remaining trainings that all employees will be asked to complete. Shift workers will be eligible to enroll, and shift work status will be tracked and coded as a potential control variable. Each participant will sign a consent form prior to baseline data collection.

2.9. Data analysis

We will employ an intent-to-treat strategy using generalized estimating equations (GEE) to evaluate group differences in the magnitude of change in outcomes over time. GEE handles missing data by using all the available information, without excluding any individual, even if they are missing at some time points. GEE models also account for clustering of employees and supervisors. The effect of interest for each outcome will be the interaction of condition by time. We will test for baseline differences between conditions on demographic variables using one-way ANOVAs (continuous variables) or chi-squares tests (categorical variables). Variables that differ significantly between groups at baseline will be included as covariates in the generalized estimating equation models of intervention effects over time.

3. Discussion

Workers in sedentary occupations, and call center employees in particular, are at increased risk of significant health and safety consequences. As the number of sedentary jobs continues to rise, effective interventions to reduce sedentary behavior are increasingly important. Using the *TWH* approach, we have designed a comprehensive program that integrates hazard protection and health promotion, alters the workplace environment, and introduces practices to promote health and well-being. To our knowledge, this study will be the first comprehensive application of the *TWH* approach for reducing sedentary behavior in the workplace. The study will also be the first to collect measures of hemoglobin A1c and vascular endothelial function in a randomized trial of an occupational sedentary behavior intervention.

Results from this study will inform future workplace sedentary behavior intervention and dissemination research, and inform best practices for workplaces to address sedentary behavior. While the effectiveness of the intervention will be less generalizable to workplaces in which employees do not have sit-stand desks, the study will test a central rationale of the *TWH* approach, that risk of disease is increased by exposures to both occupational hazards and modifiable risk factors. Results of the study will have implications for over 500,000 call center employees and over 30 million additional workers in sedentary occupations in the US.

Disclosures

The Active Workplace Study was approved by the Oregon Health & Science University Institutional Review Board. Written, informed consent to participate was obtained from all participants.

The authors declare no conflicts of interest for this article.

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Author contributions

conceptualization, B.W.; methodology, B.W., S.W., G.H., S.S., K.S., and S.T.; manuscript preparation, B.W. and S.W.; manuscript review and editing, B.W., S.W., G.H., S.S., K.S., and S.T.; funding acquisition, B.W. and S.S. All authors have read and agreed to the published version of the manuscript.

Declaration of Competing Interest

None.

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