UMEÅ UNIVERSITET

Umeå University Medical Dissertations, New Series No 2053

Interventions for increased physical activity among office workers

Viktoria Wahlström

Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för avläggande av medicine doktorsexamen framläggs till offentligt försvar i Hörsal B, 9 trappor, Norrlands Universitetssjukhus, fredagen den 22 november, kl. 09:00.
Avhandlingen kommer att försvaras på svenska.

Fakultetsopponent: Professor Andreas Holtermann
National Research Centre for the Working Environment, Köpenhamn, Danmark.

Department of Public Health and Clinical Medicine
Section for Sustainable Health

Organization
Umeå University

Document type
Doctoral thesis

Date of publication
1 November 2019

Author: Viktoria Wahlström

Title:
Interventions for increased physical activity among office workers

Background: The positive association between physical activity (PA) and health is well established. Technical developments in modern life have created major changes in our societies and working life, and a growing body of research has identified sedentary behavior (SB) as an independent risk factor for type 2 diabetes, cardiovascular disease, and cancer as well as for premature mortality. To promote health, it is important to find ways to decrease SB and incorporate PA in office settings, for example, by using new office designs and behavioral interventions.

Aim: The aim of this thesis was to evaluate two workplace interventions among office workers to determine if these led to increased PA and reduced SB, and to describe underlying factors behind these results.

Method: The thesis is based on two workplace interventions. The first intervention was the Inphact treadmill study, a 13-month randomized controlled trial where treadmill workstations were installed and participants were instructed to use the treadmill for at least one hour per workday. The second intervention was the Active Office Design (AOD) study. This study included a multicomponent PA promoting program, implemented in parallel with an office relocation to either traditional cell offices or to a flex office with activity-based work (ABW). The two groups in the AOD study were followed from 6 months before relocation to 18 months after.

Objectively measured data for SB, PA, and body measurements were collected in both studies. In the Inphact treadmill study, body composition, metabolic outcomes, self-reported energy and stress, and depression and anxiety scores were also measured. In the AOD study, measurements of health and lifestyle, musculoskeletal disorders, workload, work tasks, utilization of possibilities to be active at work, and perceptions of the performed PA promoting program were assessed via questionnaires. In addition, interview data were collected via focus groups and individual interviews. Linear mixed models were used for the main statistical analyses of the quantitative data. To explore the factors that influence SB and PA at work we combined factor analysis of mixed data with multiple linear regression. Interview data were analyzed using qualitative content analysis and a deductive approach to a process evaluation model.

Results: In both study populations, sitting time was low and standing time was high already at baseline, compared to other studies on office workers. In the Inphact treadmill study, the intervention group showed increased walking time during workdays compared to the control group for all follow-up measurements. At the same time, a decrease in moderate-to-vigorous PA (MVPA) was observed in both the intervention and control groups during leisure time. No intervention effects were seen on body measurements, body composition, metabolic outcomes, stress, or anxiety during the treadmill intervention.

In the AOD study, employees relocated to flex offices increased their walking time and MVPA during work hours to a greater extent than those relocated to cell offices, but neither group changed the amount of time spent sitting at work. Contrary to the Inphact treadmill study, no compensatory effects were seen during leisure time. The exploratory analysis resulted in six employee character-types, where the “harmonic and healthy” and “engaged with high workload” tended to sit more and to stand less, while the character type with “high BMI, creative and collaborative work” tended to sit less and stand more. The process evaluation of the intervention revealed a strong culture to encourage PA within the organization and that the intervention was supported by management. The timing of the program was questioned, and activities to support the relocation to the flex office with ABW were requested. Social acceptance for standing and walking at work increased, although the need for the intervention was debated due to the strong culture of facilitating PA at work already in place prior to the study.

Conclusions: We have showed long-term increases in PA were achieved in office workers, but the changes did not lead to improvements in body measurements and metabolic balance during the follow-up period. The two studies showed conflicting results regarding compensatory effects during leisure. Participants in the Inphact treadmill study decreased their MVPA during leisure, while no compensatory effects were seen in the AOD study.

Our results suggest a possible ceiling effect for the amount sitting time can be reduced in office workers, and that SB and PA in offices is influenced by many factors, such as organizational culture, physical environment, work tasks, work load and physical comfort. Together, the studies in this thesis confirm the importance of carefully tailored worksite interventions for decreasing SB and increasing PA at work.

Keywords
Sedentary behavior, physical activity, office design, workplace, treadmill workstations, office workers

Language
English

ISBN
978-91-7855-131-6

ISSN
0346-6612

Number of pages
69 + 4 papers