

Sitting, Standing and Moving among Male and Female Grocery Store Workers

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SUMMATIVE STATEMENT

Accelerometry measurements on 37 grocery store workers showed that the average worker spent about 50% of the work time standing, about 30% sitting, and about 20% moving. Female workers sat a little more and stood less than their male colleagues, to a large extent explained by a gendered distribution of work tasks. While the extents of sitting and standing may not be critical to health for the average worker, and the considerable time spent moving even beneficial, the gendered structure of work was remarkable.

KEYWORDS: Gender, retail, sedentary behavior, physical activity, compositional data analysis

PROBLEM STATEMENT

Assessments of sedentary behavior and physical activity in occupational groups are needed to understand the eventual effects of interventions aiming at health issues related to these behaviors, such as cardiovascular disorders (at too much sitting) and low-back pain (at too much standing). Even when sharing the same job title, men and women may have different work tasks and physical workloads (e.g. Nordander et al., 2009), which may, to some extent, explain that women suffer more from occupational ill-health than men. Studies of health-related behaviors should therefore be observant on gendered working conditions.

RESEARCH OBJECTIVE/QUESTION

This study aimed at describing proportions of time sitting, standing and moving among women and men during grocery store work, which has not previously been documented in the literature (Mathiassen, Bolin, Olofsdotter, & Johansson, 2020). In addition, we aimed at determining the extent to which possible differences between genders could be explained by a gendered distribution of work tasks.

METHODOLOGY

Workers at two medium-size grocery stores in Stockholm wore an Axivity accelerometer on the thigh during three full workdays. Axivity recordings were processed using the Acti4 software to identify the time-line of sitting, standing and moving. Participants kept a diary throughout the three workdays, identifying their immediate work task from a predetermined list of nine. The group mean composition of behaviors in each task, i.e. a 'task exposure matrix', was determined by synchronizing Axivity recordings with half-day video observations of work. The total percentage of time spent sitting, standing and moving was obtained across all three days for each worker, both without consideration to their work tasks, and as estimated by combining their task distribution with sit/stand/move data from the task exposure matrix. These two data materials were both summarized for women and men separately, and gender differences were expressed in terms of Hedges's g_s (Lakens, 2013).

RESULTS

A total of 17 women and 20 men (of, in total, 90 employees) participated, providing, on average, 22.2 (SD 4.6) hours of accelerometer data. According to the direct measurements, women and men spent 31.2% (SD 14.3%) and 27.1% (SD 12.7%) of their working time sitting; 50.8% (SD 12.3%) and 53.9% (SD 11.8%) time standing; and 18.0% (SD 4.7%) and 19.0% (SD 5.7%) time moving. Thus, on average, women sat more, stood less, and moved

to about the same extent as men (Hedges's g_s : 0.30, 0.25 and 0.18, respectively). Workers differed considerably in behaviors; some spent a major part of their working day sitting (up to 55% time), some standing (up to 77% time). A compositional data analysis (Gupta, Lund Rasmussen, Holtermann, & Mathiassen, 2020) showed that men spent less time sitting relative to non-sitting than women (Hedges's g_s : 0.28), while non-sitting was shared similarly between standing and moving (Hedges's g_s : 0.06) for the two genders. Both effect sizes were small (Lakens, 2013). According to the task-based estimates of behavior, women and men spent 30.8% and 25.5% of their time sitting; 51.9% and 56.0% standing; and 17.3% and 18.5% moving, respectively. Thus, the task-based behavior estimates differed between women and men to a similar extent as the directly measured behaviors, and effect sizes were very similar (Hedges's g_s : 0.32 for sitting/non-sitting, and 0.03 for standing/moving). This result suggests that the gender difference in behaviors was, to a major extent, explained by a gendered distribution of work tasks.

DISCUSSION

As expected, the grocery store workers sat less than office workers (Johansson, Mathiassen, Lund Rasmussen, & Hallman, 2020), but they also sat less than blue-collar workers in manufacturing and transportation, and to about the same extent as cleaners (Birk Jørgensen et al., 2019). Thus, they stood more than workers in these occupations. While the extents of sitting and standing *per se* may not be critical to health for the average store worker, and moving may, actually, be beneficial, some workers sat or stood for considerably longer than average, with possible negative health effects. Men spent slightly less time sitting and more time standing than their female colleagues, and the estimates of behaviors based on personal task distributions combined with a unisex task exposure matrix suggested that a major source of this difference was an unequal distribution of work tasks between women and men. For instance, women spent more time in (mainly sitting) checkout work than men, while men dominated in (mainly standing) dairy and perishables tasks. Gendered attitudes and practices explaining this inequality will be examined in other parts of the study.

CONCLUSIONS

The average grocery store worker spent considerable proportions of the working day both sitting, standing and moving; women sat a little more, stood less and moved to the same extent as men. The difference was largely explained by a gendered distribution of work tasks. While the extents of sitting, standing and moving *per se* may not be critical to health, with moving even being favorable, some workers – both women and men – could likely benefit from a more equal distribution of tasks among workers in the store.

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