A multi-faceted workplace intervention reduces low back pain in nurses’ aides: results from a pragmatic stepped wedge cluster randomized controlled trial

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1. Introduction
Nurses’ aides are among occupations with particularly high prevalence of low back pain. In light of the demographic shift attributed to ageing of the baby boomer generation, significant demands are placed upon the healthcare industry in the future (Hussain et al. 2012). Therefore, effective interventions preventing and treating low back pain among nurses’ aides are needed. Despite recommendations of bio-psycho-social interventions for prevention of low back pain (Guzman et al. 2002, Karjalainen et al. 2003), there has been few prior multi-faceted workplace interventions (Tveito et al. 2004). Participatory ergonomics, physical training and cognitive behavioural training, all respectively show limited or varying effect on low back pain (van Tulder et al. 2001, Burton et al. 2006, Rivili et al. 2008), but could potentially constitute important components in a multi-faceted intervention for prevention of low back pain. However, multi-faceted interventions are often comprehensive in nature challenging standard evaluation designs, which mean that such interventions previously have not been thoroughly evaluated in a randomized controlled design. Therefore, alternative designs to the classic randomized controlled trial being more flexible to the real-world setting have been suggested, e.g. the stepped wedge design (Leontjevas et al. 2013). Therefore, our main aim was to test the effectiveness of a three-month multi-faceted intervention consisting of participatory ergonomics, physical exercise and cognitive behavioural training on low back pain among nurses’ aides in a stepped-wedge cluster randomized controlled design.

2. Methods
Between November 2012 and May 2014, we conducted a pragmatic stepped-wedge cluster-randomized controlled trial with 594 nurses’ aides randomized to four successive time periods, three months apart. The intervention lasted 12 weeks and consisted of 19 sessions in total (physical training (12 sessions), cognitive behavioural training (2 sessions) and participatory ergonomics (5 sessions)). Low back pain was the outcome and was measured as days, intensity (worst pain on a 0-10 numeric rank scale) and bothersomeness (days) by monthly text messages. Linear mixed models were used to estimate the intervention effect. Analyses were performed according to intention to treat, including all eligible randomized participants and were adjusted for baseline values of the outcome.

3. Results
Out of 1074 eligible employees from 54 teams, 594 employees wanted to participate and were randomized. The primary outcome was based on assessments from 586 participants (8 people not included in text message system). The linear mixed models yielded significant effects on low back pain days of -0.8 (95% confidence interval -1.19 to -0.38), low back pain intensity of -0.4 (95% confidence interval -0.60 to -0.26) and bothersomeness days of -0.5 (95% confidence interval -0.85 to -0.13) after the intervention compared to the control group.

4. Discussion
This study shows that a multi-faceted intervention consisting of participatory ergonomics, physical training and cognitive behavioural training can reduce low back pain for an entire population of workers including both participants with and without pain. Thus, multi-faceted workplace interventions may be relevant for improving low back pain at a population level.
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References


