

Evaluation of a participatory ergonomic intervention process in kitchen work

Irmeli Pehkonen^{a,*}, Esa-Pekka Takala^a, Ritva Ketola^a, Eira Viikari-Juntura^a, Päivi Leino-Arjas^a, Leila Hopsu^a, Tuija Virtanen^a, Eija Haukka^a, Merja Holtari-Leino^b, Elina Nykyri^a, Hilikka Riihimäki^a

^a*Finnish Institute of Occupational Health, Topeliuksenkatu 41 a A, FIN-00250 Helsinki, Finland*

^b*Occupational Safety and Health Inspectorate of Turku and Pori, Eerikinkatu 40-42, FIN-20100 Turku, Finland*

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Abstract

We evaluated a participatory ergonomic intervention process applied in 59 municipal kitchens. In groups of three to five kitchens, the workers participated in eight workshops, and generated and evaluated solutions to optimize musculoskeletal load in their work. An ergonomist initiated and supported the process. By the end, 402 changes were implemented. Evaluative data were collected using research diaries, questionnaires, and focus group interviews. The intervention model proved feasible and the participatory approach was mostly experienced as motivating. The workers' knowledge and awareness of ergonomics increased, which improved their ability to tackle ergonomic problems by themselves. The changes in ergonomics were perceived to decrease physical load and improve musculoskeletal health. As hindering factors for implementation, lack of time and motivation, and insufficient financial resources were mentioned. In addition, the workers expressed a wish for more support from the management, technical staff, and ergonomists.

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1. Introduction

Both physical load and psychosocial factors at work have been shown to play a role in the aetiology of musculoskeletal disorders (Ariens et al., 2001; Hoogendoorn et al., 1999, 2000; National Research Council and Institute of Medicine, 2001; Riihimäki and Viikari-Juntura, 1999). We can therefore hypothesize that musculoskeletal problems can be reduced by optimizing the biomechanical and psychosocial load at work.

The participatory approach has been successfully used in several studies to reduce physical work demands and to prevent musculoskeletal disorders (Hignett et al., 2005; van der Molen et al., 2005a; Vink et al., 2006). In this approach, workers play an active role in the analysis of work and the planning of improvements (Haines and

Wilson, 1998). Its benefits have been the utilization of workers' experience and knowledge, learning of participants, and their commitment and better acceptance of changes (Wilson, 1995).

Intervention programmes have seldom been documented and evaluated adequately (Lincoln et al., 2000; van Poppel et al., 1997; Westgaard and Winkel, 1997). Among the most obvious objects of evaluation are the incidence of disorders, work satisfaction, and productivity. However, even the process of intervention deserves to be assessed, e.g., the number of changes implemented, participants' satisfaction with their involvement (Wilson and Haines, 2001), as well as their awareness and knowledge of ergonomics.

Kitchen work includes many physical and psychosocial load factors and the employees have plenty of musculoskeletal problems (Arbetsmiljöverket and Statistiska centralbyrån, 2004; Huang et al., 1988; Ono et al., 1998; Pekkarinen and Anttonen, 1988; Perkiö-Mäkelä et al.,

*Corresponding author. Tel.: +358 304742415; fax: +358 304742006.
E-mail address: irmeli.pehkonen@ttl.fi (I. Pehkonen).

2006; Shibata et al., 1991). This study is part of a randomized controlled trial aimed at reducing the occurrence of musculoskeletal disorders. The aims of the intervention were to increase workers' knowledge and awareness regarding ergonomics of their work, to encourage workers to be active participants in developing ergonomics, and to implement improvements in kitchen ergonomics. This article describes the intervention process and evaluates its feasibility with regard to the elements of the intervention process, and available resources and support. We also report the effects of the intervention on ergonomic knowledge and awareness, and the workers' expectations and perceived effects of the intervention on workload and musculoskeletal health. The efficacy of the intervention will be reported elsewhere.

2. Material

The study was performed in municipal kitchens of four large cities in Finland. Kitchens with at least three full-time employees working at least 6 h per day were included. Kitchens were randomized to intervention ($n = 59$) and control ($n = 60$) group. This article involves only the intervention kitchens, in which the workers developed their working conditions over an 11–14-month intervention period.

The 59 intervention kitchens belonged to schools ($n = 43$), kindergartens ($n = 10$), nursing homes and geriatric service centers ($n = 5$), and one was a central kitchen. The total number of workers was 263. Eighty-six percent ($n = 227$) of them remained employed in the same kitchen throughout the intervention phase. The workers were mainly women (96%) with a median age of 46 (range 19–63) years. The median time in kitchen work was 17 (range 0–40) years. Over the last 3 months, 87% of workers had reported pain in some part of the musculoskeletal system, mostly in the neck (71%), lower back (50%), or forearms or hands (49%) (Haukka et al., 2006).

3. Intervention process

The intervention was carried out in a participatory way based on the experiences and model developed earlier at the Finnish Institute of Occupational Health (Leppänen, 2001; Leppänen et al., 2005). The approach was based on active group work: the workers identified problems in their work and generated and evaluated solutions for them. The changes were implemented together with the workers, middle management and technical staff. The role of the ergonomist was to initiate and guide the process, train the participants, and be available for consultation. In two cities, a local steering group was set up for improving the exchange of information between the research group and food service management.

To be able to provide sufficient research personnel to support the intervention and to manage the data collection, the intervention phase was executed in series of three to five kitchens. The series ($n = 16$) entered the study sequentially in time (Fig. 1). The study was carried out by four teams, composed of two researchers each. One researcher (later in the text 'ergonomist') was in charge of the implementation, whereas the main task of the other was to assess the state of ergonomics and document the implemented changes. Two teams handled seven series, and the other two one series each. Regular meetings were held to standardize the working methods of the teams. In addition, a project coordinator participated in the workshops, observed the working of the researchers, and provided them with feedback.

The intervention phase was composed of a 2-month pre-implementation phase and a 9–12-month implementation phase (Fig. 2). The total duration of the intervention phase was usually 14 months (in 40 kitchens in 11 series). In 19 kitchens (5 series), the length was 11 months because the kitchens of schools were closed for over 2 months during summer holidays.

3.1. Pre-implementation phase

At the beginning, the management and kitchen workers were informed of the project and encouraged to participate

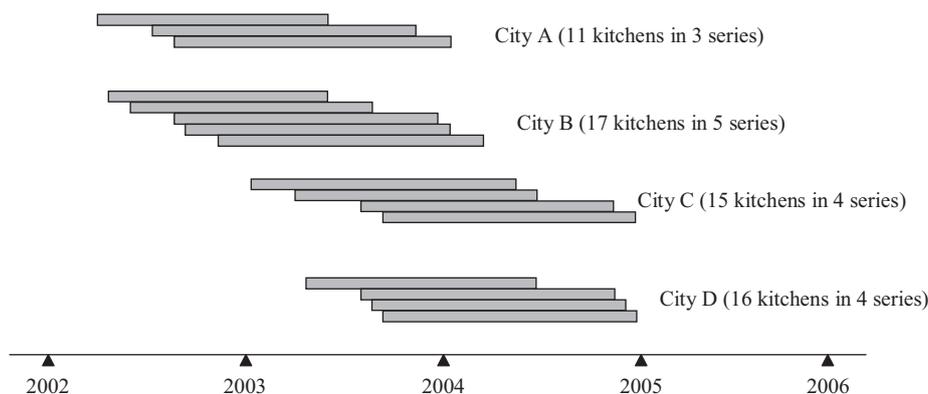


Fig. 1. Timetable of the project. The length of the bar describes the intervention phase in each series of kitchens.

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