Investigation of musculoskeletal symptoms and ergonomic risk factors among female sewing machine operators in Turkey

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ABSTRACT

This cross-sectional study aimed to identify the prevalence of musculoskeletal symptoms and ergonomic risks in female sewing machine operators at a textile company. The study sample comprised all female sewing machine operators in the company. The sample included 283 sewing machine operators. Data were collected through the use of the adapted Nordic Musculoskeletal Questionnaire and by direct observations via the rapid upper limb assessment (RULA) to determine ergonomic risks. RULA is a validated tool for assessment of ergonomic risks. The mean age of the women was 30.2 (SD: 8.4) and the mean number of years of employment was 13.4 (SD: 5.5). The highest prevalence rates for the women's musculoskeletal symptoms were in the trunk (62.5%), neck (50.5%), and shoulder (50.2%). Of the women, 65% had experienced musculoskeletal pain or discomfort over the last 6 months. Pain intensity of these symptoms was assessed with a visual analogue scale. The average pain intensity of the women was found to be 3.5 (SD: 2.8). Results of the RULA scores were found to be quite high. There were no employees who received RULA scores of 1−2, which indicates acceptable postures (all scores >5). The final RULA scores of 6.9 indicate that the participants' postures at their work stations need to be investigated immediately.
Relevance to industry: This study based on the RULA method allowed to perform a rapid and quite correct evaluation tolls for SMOs. For this research population, the research findings provided fundamental data on the prevalence of musculoskeletal symptoms and ergonomic risks among Turkish female SMOs.

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1. Introduction

Musculoskeletal disorders (MSDs) are a major cause of work-related disabilities and injuries in the developed and industrially developing countries (Andersen and Gaardboe, 1993; Choobineh et al., 2004; Kaergaard and Andersen, 2000). MSDs, particularly those of the upper body, are increasingly prevalent in western societies (Strazdins and Bammer, 2004). According to findings in some studies, the prevalence of MSDs is 10%; it is as high as 80% in others (Eerd et al., 2003). Musculoskeletal disorders are more common among women than among men (Dahlberg et al., 2004). Although men and women may have the same job title, they still do not perform the same type of work tasks (Yun et al., 2001). Today, women are probably more often exposed to monotonous repetitive, and heavy work tasks than men, e.g. Health care personnel, cashiers, cleaners, and sewing machine operators (SMOs) (Brisson et al., 1989; Dahlberg et al., 2004).

Sewing machine operation includes jobs that involve operating power sewing machines to sew, alter or repair wearing apparel, linens, blankets, and other fabric articles. This includes operation of automatic sewing machines when the operator must know how to thread the machine, wind bobbins, adjust tension, and oil parts. Sewing machine operators use hands to handle, control, or feel objects, and tools; sit for long periods of time, and repeat the same motions (Kaergaard and Andersen, 2000; Wang et al., 2007). For this reason, a high prevalence of musculoskeletal symptoms of neck, shoulder, back, hand/fingers and lower extremities have been found in studies of female SMOs (Kaergaard and Andersen, 2000; Brisson et al., 1989; Kilroy and Dockrell, 2000; Vihma, 1982).

Turkey, in which this study was conducted, is a developing country with a population of 68 million. Half of Turkey's population is composed of women, 19% of these women (5.7 million) are illiterate (Esin and Öztürk, 2005; Ministry of labour and social security, 2005). While the participation of women in the labour force was 28% in 1988, this percentage decreased to 24.5% in 2004. Of the working women, 77% are family workers without pay and 14% are employed as industrial workers (Esin and Öztürk, 2005). Working women in Turkey have a lot of problems concerning wages, employment, working conditions and social benefits. The vast majority of women working in industry are employed in textiles. Being the most developed sector in Turkey, the textile

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