The impact of decision latitude, psychological load and social support at work on the development of neck, shoulder and low back symptoms among female human service organization workers

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ABSTRACT

The aim of the present study was to investigate longitudinal relations between decision latitude, psychological workload and social support and musculoskeletal neck, shoulder and low back symptoms. In this longitudinal two-wave cohort study a questionnaire survey was conducted among female human service organization workers ($n = 1690$). The analyses were based on respondents who were considered free from the respective symptoms at baseline measurements, resulting in study samples of $n = 741$ for neck symptoms, $n = 670$ for shoulder symptoms, and $n = 640$ for low back symptoms. In general support was found for the job demand–control–(support) model. High strain work (high psychological load coupled with low decision latitude) in combination with low social support ('iso-strain') was related to increased risks of developing symptoms (occurrence of new episode) in all the body regions studied (neck, shoulder and low back).

Relevance to industry: The results indicate that, in order to minimize the occurrence of musculoskeletal symptoms, it is important to ensure that employees have adequate levels of decision latitude, to keep the workload at optimal levels, and to provide supervisor support and structures that facilitate coworker support.

1. Introduction

Work-related musculoskeletal symptoms continue to constitute a major problem in the industrialized world, in spite of ergonomic improvements that have been made at the workplaces (Bongers et al., 2006; Johansson, 1995; Melin and Wigaeus Tornqvist, 2005; Morse et al., 2005). It is therefore important to extend our knowledge of the factors involved in the aetiology of these disorders and the mechanisms by which they operate.

An influential model within the literature focusing on work-related ill health is the Karasek job demand–control model (Karasek, 1979). This is a conceptual model of the interaction between job demands and job control (decision latitude) and its effect on ill health. High demands in combination with low decision latitude i.e., "job strain" are hypothesized to have especially adverse health effects. Social support is assumed to moderate this relationship

(Johnson, 1985, 1986; Johnson and Hall, 1988), such that insufficient levels of social support will enhance the adverse health effects of job strain (isolation strain termed 'iso-strain'). In a recent review of risk factors for neck and upper limb symptoms Bongers et al. (2006) conclude that high work demands or low job control often are related to such symptoms, but that this relationship is neither very strong nor very specific. In that review (Bongers et al., 2006) it was also found that most studies investigating job strain report a relationship between the combined effects of high demands and low control and neck and shoulder symptoms. Another review found modest support for the hypothesis that the combination of high demands and low control is especially related to poor health and well-being in general (De Lange et al., 2003).

Few studies have investigated the combined effects of demands, control and social support on musculoskeletal symptoms; however some (cross-sectional) support for such a (three variable) interaction has been reported in the literature (Johansson, 1995). The aim of the present study was therefore to investigate the main and combined effects of psychological load (job demands), decision latitude (job control) and social support on the development of

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neck, shoulder and low back musculoskeletal symptoms (12-month occurrence of new episode) in a two-wave cohort study among female human service organization workers.

2. Methods

The present study is part of a longitudinal cohort study with survey data collected in the 1990s, with an 18-month distance between the two waves. It is based on a questionnaire survey among employees in Swedish human service organizations (Pousette and Johansson Hanse, 2002). The response at wave 1 was approximately 80% and about 78% of the respondents participated in both waves. Telephone interviews were conducted on a subsample (about 40%) of the participants who participated in wave 1 but not in wave 2. Among the most common reasons for not responding to the follow-up questionnaire were maternity leave, age-related retirement and absence due to studies.

2.1. Participants

The sample consisted of female human service organization workers ($n = 1690$). The most common types of occupations were child-minder (32%), preschool teacher (16%), nursing assistant (17%), and nursing assistant in outpatient care (10%). At baseline measurements about one-fourth of the respondents were between 20- and 34-year-old, about one-fifth were between 35- and 49-year-old and about one-fourth were between 50-and 64-year-old. The seniority of the participants was rather high, with 66% having more than 5 years of employment, and only 7% having less than 1 year of employment. Prevalence of symptoms during the past 12 months at baseline measurements was 56% for the neck, 60% for the shoulders, and 62% for the low back. There was an association between neck and shoulder symptoms ($r = .55, p < .05$), and also between low back symptoms and neck ($r = .25, p < .05$) and shoulder ($r = .20, p < .05$) symptoms.

Previous research on risk factors for neck and shoulder symptoms indicates that there may be different risk factors related to the incidence and the recurrence or persistence of these symptoms (Larsman et al., 2007; Luime et al., 2004). Because the aim of the study was to investigate risk factors for the development of symptoms (12-month occurrence of new episode), a cohort-approach was chosen where the analyses for the different body regions were based on respondents who were considered free from the respective symptoms at baseline measurements, i.e., those participants reporting no symptoms during the past 12 months at wave 1, resulting in study samples of $n = 741$ for neck symptoms, $n = 670$ for shoulder symptoms, and $n = 640$ for low back symptoms.

2.2. Measures

Musculoskeletal symptoms were assessed using the general Nordic Musculoskeletal Questionnaire (NMQ) (Kuorinka et al., 1987), which refers to the human body as divided into anatomical regions and requires the respondent to indicate whether she has experienced symptoms (ache, pain, discomfort) in these anatomical regions during the past 12 months. The present study deals with symptoms (yes/no) in the *Neck*, *Shoulder*, and *Low back* during the past 12 months.

Employee perceptions of their work environment were measured using a slightly modified version of the PAK questionnaire (Rubenowitz, 1989, 1997), focusing on five psychosocial factors that should be satisfied at work in order to meet employee's fundamental psychological needs. Each factor comprises a number of items where each item has five fixed response alternatives

ranging from very unsatisfactory (1) to very satisfactory (5). These factors are as follows:

i) Influence on and control over work ($\alpha = .74$, $m = 3.51$, sd = .83) (short version) with the items "influence on the rate of work", "influence of working methods", and "influence on task allocation".

ii) Supervisor climate ($\alpha = .84$, $m = 3.72$, sd = .75) with the items "contact with immediate supervisor", "immediate supervisor asking for advice on work-related issues", "immediate supervisor considering viewpoints", "satisfaction with amount of information provided by immediate supervisor", and "communication climate".

iii) Stimulus from work ($\alpha = .81$, $m = 3.84$, sd = .66) with the items "interesting and stimulating work", "varied and diversified work", "opportunity to use talents and skills", "opportunity for learning", and "feelings towards your work".

iv) Relations with fellow workers ($\alpha = .83$, $m = 4.28$, sd = .59) with the items "relations and contacts with fellow workers", "discussing work with fellow workers", "workgroup climate", "overt discussion of conflicting opinions", and "friendship with fellow workers".

v) Psychological load ($\alpha = .72$, $m = 2.98$, sd = .75) (short version) with the items "pushed with work", "work overload", and "mental pressure".

Each of these factors was measured by calculating the mean value for the respective items, with high mean values indicating a high influence, a satisfying supervisor climate, high stimulus from work, satisfying relations with fellow workers and a high psychological load.

2.2.1. Constructed measurements

Based on theoretical considerations and empirical research (see Johansson, 1995) it was assumed that the factors "influence on and control over work" and "stimulus from work" correspond to "decision latitude/work control" according to Karasek et al. (1981) while "supervisor climate" and "relations with fellow workers" corresponds to coworker and supervisor job "social support" according to US quality of employment studies (Karasek and Theorell, 1990), and "psychological load" corresponds partly to Karasek's index "psychological job demands" (Karasek, 1979). The indices *decision latitude* ($\alpha = .80$, $m = 3.72$, sd = .60), *social support* ($\alpha = .83$, $m = 4.00$, sd = .55) and *psychological load* ($\alpha = .72$, $m = 2.98$, sd = .75) were constructed accordingly, and these constructed variables were used for analyses in the present study. Social support and decision latitude were positively correlated ($r = .36, p < .05$), while psychological load was negatively correlated with social support ($r = -.18, p < .05$) and with decision latitude ($r = -.21, p < .05$).

2.3. Statistical analysis

In order to compare the risk of developing symptoms (defined as the 12-month occurrence of new episode at wave 2 measurements) among those exposed to high versus low decision latitude, social support and psychological load (assessed at wave 1 measurements), these factors were dichotomized by using the median split for the respective variable. A composite variable combining exposure to these factors was also constructed so that differences in risks between subjects with different exposure patterns could be assessed. This composite variable includes the three psychosocial components and their intersecting dichotomies, resulting in eight different exposure combinations. The theoretically lowest strain group (low psychological load in combination with high decision latitude and high social support)