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Original Article

Relationship between Comorbid Health Problems and Musculoskeletal Disorders Resulting in Musculoskeletal Complaints and Musculoskeletal Sickness Absence among Employees in Korea

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ABSTRACT

Background: To investigate the relationship between musculoskeletal disorders and comorbid health problems, including depression/anxiety disorder, insomnia/sleep disorder, fatigue, and injury by accident, and to determine whether certain physical and psychological factors reduce comorbid health problems.

Methods: In total, 29,711 employees were selected from respondents of the Third Korean Working Conditions Survey and categorized into two groups: Musculoskeletal Complaints or Musculoskeletal Sickness Absence. Four self-reported health indicators (overall fatigue, depression/anxiety, insomnia/sleep disorder, and injury by accident) were selected as outcomes, based on their high prevalence in Korea. We used multiple logistic regression analysis to determine the relationship between comorbid health problems, musculoskeletal complaints, and sickness absence.

Results: The prevalence of musculoskeletal complaints and musculoskeletal sickness absence due to muscular pain was 32.26% and 0.59%, respectively. Compared to the reference group, depression/anxiety disorder and overall fatigue were 5.2–6.1 times more prevalent in the Musculoskeletal Complaints Group and insomnia/sleep disorder and injury by accident were 7.6–11.0 times more prevalent in the Sickness Absence Group. When adjusted for individual and work-related physical factors, prevalence of all four comorbid health problems were slightly decreased in both groups.

Conclusion: Increases in overall fatigue and depression/anxiety disorder were observed in the Musculoskeletal Complaints Group, while increases in insomnia/sleep disorder and injury by accident were observed in the Sickness Absence Group. For management of musculoskeletal complaints and sickness absence in the workplace, differences in health problems between employees with musculoskeletal complaints and those with sickness absence as well as the physical and psychological risk factors should be considered.

1. Introduction

Work-related musculoskeletal disorders (MSD) are a significant health problem due to temporary or permanent incapacity to work, sickness absence, and ill-health retirement among the working population [1,2]. Thus, much research on MSD has been focused on professionals in various jobs, including nurses [3], farmers [4], and office clerks who use computers [5]. Studies have demonstrated that many physical and psychosocial factors are associated with MSD, including heavy physical work, lifting, forceful movements, awkward postures, whole-body vibration, stress, job satisfaction, work demands, and the organizational culture of the workplace [6–9].

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MSD can be reduced by controlling certain physical and working conditions [10–12]. Lipscomb et al [13] suggested that preventing MSD in registered nurses requires systemic approaches to scheduling, aimed at reducing the time of exposure to demanding work conditions. Another study reported that other protective measures against MSD include teamwork and coworker support, reduction in unabated repetitive work, lower management strain and noise at work, better work postures, satisfaction with their supervisor's attitude, and leisure exercise [14].

Due to these factors, MSD is frequently accompanied by various comorbid health symptoms. Leclerc et al [15] reported that depression and anxiety have frequently been observed in concurrence with neck disorders, and another study reported that sleep duration and efficiency was lower in a group of people with musculoskeletal pain than in a control group [16]. Additionally, fear of pain, fear of work related activities, fear of movement, and fear of injury is a particular characteristic of workers with MSD [17]. Overall, these comorbid diseases result in a lower quality of life and diminished social involvement [18].

Many studies have been conducted to investigate depression, anxiety, injury, and insomnia among workers with MSD, but thus far, none have examined the relationship between the overall measure of comorbid symptoms and MSD. Although several studies showed that reducing workload and working hours could reduce MSD, it is still not clear whether these factors can reduce the symptoms of comorbid health conditions.

The purpose of our study was to investigate the relationship between musculoskeletal disorders and comorbid symptoms such as depression/anxiety disorder, insomnia/sleep disorder, fatigue, and injury by accident. In addition, we investigated whether physical and psychological factors such as workload, working hours, and job satisfaction result in reduced comorbid symptoms.

2. Materials and methods

2.1. Participants and study sample

The Third Korean Working Conditions Survey was performed by the Korea Occupational Safety and Health Agency (KOSHA). The survey was based on a representative sample of the economically active population aged 15–64 years. At the time of the interview, selected participants were either working employees or were self-employed. In general, random face-to-face surveys involve considerable and increasing difficulties in reaching respondents because of not only refusals and/or lack of response, but also logistical problems such as difficulty in attaining building access and empty households. Retired and unemployed persons, homemakers, and students were excluded and written informed consent was obtained from each respondent before the survey. The survey was conducted in June 2011 using three-stage stratified sampling. The questionnaire was similar to that used in the European Working Conditions Survey [19] and the Labour Force Survey (Labour Force Survey User Guide-Volume2-2011 Questionnaire Office for National Statistics) in the UK. The survey contained questions regarding time spent working, physical risk factors, organization of the workplace, impact of work on health, satisfaction with working conditions, and violence/bullying/harassment in the workplace. The response rate was 35.4%, and the questionnaires were completed by 50,032 workers. As our investigations excluded self-employed persons, the final total analyzed population in this study comprised of 29,711 employees.

2.2. Measures

In this study, participants were classified as having "musculoskeletal complaints" if they responded positively to the survey question, "Over the past 12 months, did you have muscular pain in your upper or lower body, except back pain, due to your job (yes/no)?" Of the patients in this group, 328 participants were excluded from the analysis because the cause of their pain was not work related. Participants were classified as having "musculoskeletal sickness absence" if they reported being absent at least 1 day after January 1, 2010, because of muscular pain in their upper body or lower body, or back pain due to their job (not including accidents as a cause).

Covariates investigated included age in years, gender, years in current job, and employment status. With respect to shift work, the participants were questioned on whether they were engaged in shift work or not. Regarding working hours, Korean labor law limits working hours to 8 h/d, 5 d/wk (or 40 h/wk in total). Participants were grouped into three groups based on Korea labor law: $>$ 48 h/wk, $\geq$ 40 hours and $\leq$ 48 hours, and $<$ 40 hours a week.

Work-related physical factors included high workloads that were defined as working at very high speeds or under tight deadlines for more than half of the work day. Work-related psychosocial factors included job satisfaction that was rated on a 4-point scale as "very satisfied," "satisfied," "not very satisfied," and "not at all satisfied." High job satisfaction was defined as a response of "very satisfied" or "satisfied."

Outcome-related health problems were used to assess the overall comorbid health problems of workers with MSD. Occurrence of comorbid health problems were measured by response to the question, "Over the past 12 months, did you suffer from any of the following health problems? (yes/no)." Four self-reported health indicators (overall fatigue, insomnia/sleep disorder, depression/anxiety, and injury by accident) were selected as outcomes based on their high prevalence in Korea [20,21].

2.3. Statistical analysis

The frequency and prevalence rates of sociodemographic characteristics of the participants were calculated. Logistic regression analysis was performed to examine associations between musculoskeletal complaints and sickness absence, and occurrence of comorbid health problems. The odds ratios (ORs) and 95% confidence intervals were calculated. Data were analyzed by logistics regression using SAS 9.2 (SAS Institute Inc., Cary, NC, USA). Hence, the SAS procedure used is proc surveylogistic and the weighted value is the benchmarking weight. In general, the weight of the sample survey is composed of design weight, nonresponse adjustment weight, and benchmarking weight. Design weight is calculated by multiplying response rate with the reciprocal of the extraction rate. In the case of nonresponse weight, weight is calculated under the assumption that the response rates within each class are identical to each other by considering the whole response rate. All p values were two-tailed, and $p < 0.05$ was considered statistically significant.

3. Results

The characteristics of the participants are presented in Table 1. The prevalence of musculoskeletal complaints was 33.06%, and prevalence of musculoskeletal sickness absences was 0.72% due to muscular pain in their upper limbs, lower limbs, or their back. Notable differences were observed in the prevalence rates between the baseline characteristics; older age groups, people working for $>$ 48 h/wk, people working for $<$ 40 h/wk, people who had spent $<$ 5 years in their current job, temporary and day employees, and shift workers had a higher prevalence of musculoskeletal complaints and musculoskeletal sickness absences compared with other subgroups.