MUSCULOSKELETAL DISORDERS AMONG YOUNG APPRENTICES AND JOURNEY-LEVEL CONSTRUCTION WORKERS IN HUNGARY

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The purpose of this study was to determine the prevalence of work-related musculoskeletal disorders (MSDs) among young apprentices entering the construction trade. One hundred ninety-one young apprentices from plumbing and sheet metal trade schools in Hungary participated in the study. Additionally, pilot data from 65 journey-level workers in Hungary was obtained for comparison. Data collection consisted of an administered symptom survey. The participation rate was 98% among apprentices. The average age of the apprentices was 17 years (range 15 to 21). The 12-month period prevalence of self-reported work-related MSD symptoms for apprentices was highest in the low back, wrist/hands, and shoulders. Nearly 40% of the apprentices that indicated the presence of back pain missed work as a result of the symptoms at least one day in the previous 12 months. Although MSD symptoms are more prevalent among experienced construction workers, this study indicates that MSDs begin early in a construction worker's career. Additional studies involving larger populations of construction workers of all ages are needed to determine the magnitude of MSDs in Hungary and other Central European countries. A multinational comparison of the prevalence of work-related MSDs and the job factors contributing to MSDs would assist in the identification of best work practices and tools that help prevent MSDs for workers in the construction industry.

INTRODUCTION

There is a large body of evidence indicating that deaths, traumatic injuries, and illnesses are more prevalent among workers in the construction industry than for most other occupational groups in all industrialized nations (Holmström, et al., 1995; Schneider and Susi, 1994; Schneider et al., 1998). Many of the serious ailments in construction are not induced by acute trauma but instead develop incrementally from repeated physical stress and are broadly referred to as musculoskeletal disorders (MSDs). According to Holmström (1995), Swedish insurance companies determined that 72% of all sick-leave greater than four weeks in the construction industry was related to MSDs. Musculoskeletal disorders can lead to absenteeism, lost productivity, personal financial burden, physical suffering, disability and early retirement (Holmström, 1995).

Factors associated with MSDs include extreme work postures, static positions, high force levels, and repetitive motions which are often present in construction tasks (Holmström et al., 1995). Unfortunately, we do not know what level of cumulative exposure to the risk factors leads to a pathology, disorder, or impairment. Similarly, it is

not known when construction workers begin to develop symptoms suggestive of disorders such as low back pain, carpal tunnel syndrome, and shoulder tendonitis. Although there is clear evidence that experienced construction workers have MSDs (Holström et al., 1995), it is unclear if these disorders are present in construction apprentices beginning their profession. The purpose of this pilot study was to determine the prevalence of MSD symptoms in a sample of Hungarian construction apprentices and journey-level workers.

METHODS

The participants included 191 apprentices enrolled in a trade school for sheet metal and electrical workers and 65 experienced journey level workers in the electrical, sheet metal, and wood working trades. The trade schools and experienced workers were associated with the Construction Trade Union of Hungary. Participants were recruited from regions surrounding Budapest, Hungary. Each participant completed a symptom survey that was similar to the Standardised Nordic Questionnaire (Kuorinka et al, 1987) and identical to surveys employed in previous epidemiological studies of MSDs by the investigators (Rosecrance et al, 1996). The questionnaire was translated into Hungarian and administered by two occupational health nurses. The nurses explained the instructions and answered questions that participants had relating to the questionnaire and overall study procedures. If the participants had difficulty reading or were illiterate, the survey was read to the participants and completed by the occupational health nurse.

The first section of the questionnaire consisted of questions addressing age height, weight, years in trade, apprentice training, a brief medical history of systemic diseases and questions regarding occupational tasks. The second portion of the questionnaire addressed the period prevalence of work-related musculoskeletal symptoms within the last 12 months. This portion was a modification of the Standardised Nordic Questionnaire and consisted of questions referring to nine anatomical areas. A body diagram with the nine anatomical areas (neck, upper back, low back, shoulders, elbows, wrist/hands, hips, knees, and feet) highlighted was incorporated to help the participants answer "yes" or "no" to the following question. "During the last 12 months have you had a job-related ache, pain, discomfort, etc." - followed by a list of the nine different anatomical areas indicated. If the respondent indicated "yes" that a work-related musculoskeletal symptom had occurred, they were instructed to answer "yes or no" to two additional questions. The questions were (1) "during the last 12 months have you been prevented from doing your day's work due to this condition?" and (2) "during the last 12 months have you seen a physician for this condition?"

RESULTS

Of the 195 apprentices that were eligible to participate, 191 completed the questionnaire. The participation rate among the apprentices was 98%. Four apprentices were absent on the day of testing and one apprentice did not participate in the testing due to illness. The 65 journey-level construction workers were a sample of convenience and consisted of instructors at the trade school and other workers at nearby construction sites. All experienced workers that were asked to complete a survey filled one out. The average age of the apprentices was 17 years (S.D. 1.2, range 15 to 21) and 47 years (S.D. 9.4) for the journey-level construction workers. The average number of years the apprentices were working in the trade (including classroom and or on the job training) was 2.9 years (S.D. 1). The journey level workers had an average of 25.5 years (S.D. 12.7) of construction experience.

The 12-month period prevalence of reported work-related MSD symptoms were highest in the low back for both apprentices and journey-level workers. Thirty percent of apprentices and 58% of experienced construction workers indicated "yes" to low back symptoms in the previous 12-months. The second and third highest prevalence for symptoms were in the wrist/hands (18%), and shoulders (12%) for apprentices and in the knees (49%) and shoulders (45%) for experienced construction workers (see Figure 1.).

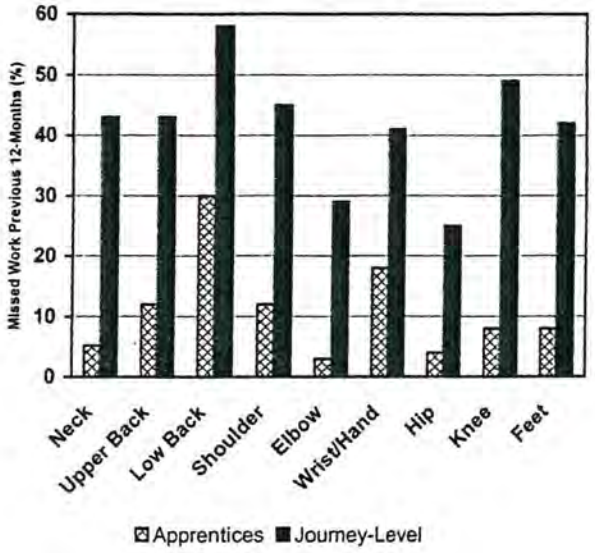

Figure 1. 12-month period prevalence of MSD symptoms for apprentices and experienced Hungarian construction workers.

Nearly 12% of the apprentices and 40% of the experienced construction workers that indicated the presence of back pain missed work as a result of the symptoms in the previous 12 months (Figure 2.). Apprentices had a lower prevalence of missed work for all anatomical areas compared to the journey-level workers. Although 30% of the apprentices and 58% of the experienced construction workers had work-related low back symptoms in the previous 12 months, only 4% of the apprentices and 12% of the journey-level workers sought medical attention for their ailment (Figure 3.). Thus, all Hungarian construction workers were more likely to have missed work for a low-back MSD than to have consulted a physician for their low back symptoms. Construction workers in both groups reported a higher prevalence of missed work than physician visits for all anatomical areas included in the survey.

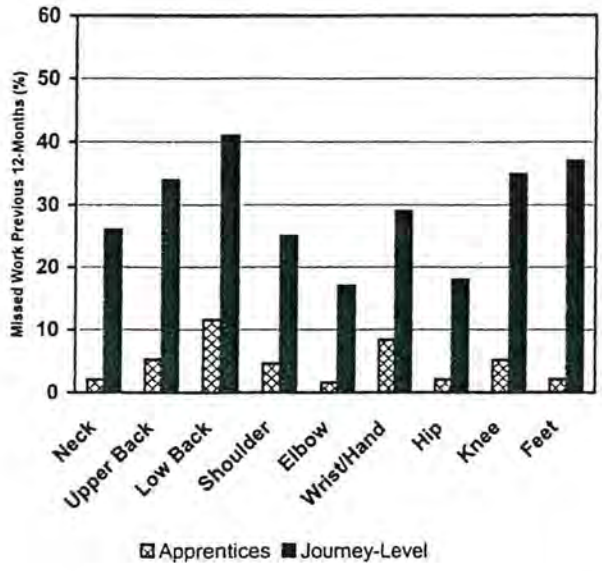

Figure 2. 12-month period prevalence of reported missed work due to work-related MSD symptoms among apprentices and experienced construction workers in Hungary.

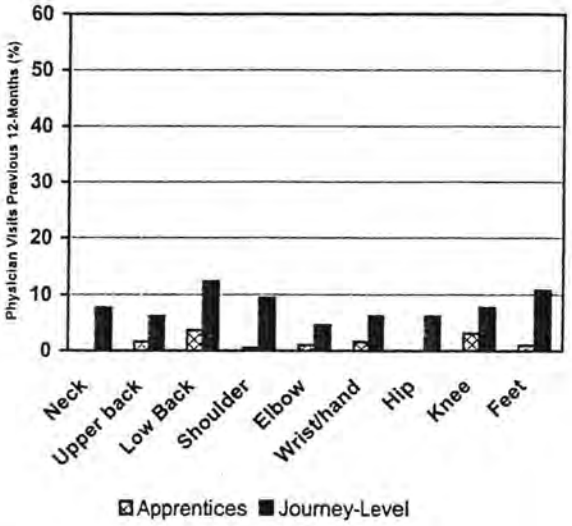

Figure 3. 12-month period prevalence of physician visits due to work-related MSD symptoms among apprentices and experienced construction workers in Hungary.

DISCUSSION

There are several methodological limitations related to interpreting the information in this study. The 12-month period prevalence rates of work-related MSD symptoms do not represent the prevalence of a specific medical pathology but may, however, precede the diagnosis of a work-related MSD. A 12-month recall period has limitations due to the duration of elapsed time and should be taken into account when drawing conclusions from data sources involving recall of events and information. Additionally, because of the small sample sizes in this study, the results should not be considered representative of the construction populations in

Hungary. Much larger samples are needed to determine prevalence rates of MSDs that represent the construction trades in Hungary.

The most significant finding of this study is the relatively high prevalence of work-related MSD symptoms in the young construction apprentices. Although the mean age of the apprentices is only 17 years, 30% of them reported work-related MSD symptoms in the low back during the previous 12 months. The work-related low back symptoms may be associated with several factors including prolonged standing, working in a bent over position at work benches in the shops where the apprentices practice their learned skills, weekend construction work, as well as non-occupational activities. Although hand\wrist symptoms were the second most prevalent MSD symptom, we did not determine the specific disorder (i.e. tendinitis, carpal tunnel syndrome, etc...) based on these survey results. Additional analyses are being performed to investigate the prevalence of carpal tunnel syndrome in this group of apprentices.

As expected, the experienced construction workers had a much higher prevalence of MSD symptoms in all anatomical areas assessed. The high prevalence of symptoms is likely related to a combination of factors including, general health status, age, and the repeated physical stresses involved with construction tasks (Holmström et al., 1995). Musculoskeletal disorders in construction work have been strongly associated with heavy physical work, vibration exposure, frequent use of hand-held tools, repetitive work, and awkward postures (Schneider et al., 1998).

Musculoskeletal disorders are an enormous economic burden for construction enterprises. Besides causing human suffering, MSDs result in absenteeism and early retirement, which are significant financial costs for private companies and governments. During 1988-1989, 72% of all sick leaves longer than 4 weeks in the construction industry in Sweden were due to MSDs (Holmström et al., 1995).

Despite the fact that construction work is one of the most physically stressful occupations (in nearly every country), there are no epidemiological studies assessing occupationally related MSDs in Hungary, or many other Central European countries. A multinational comparison of the prevalence of work-related MSDs and the job factors contributing to MSDs would assist in the identification of best work practices and tools that help prevent MSDs for workers in the construction industry.

Assessing the magnitude and nature of work-related MSDs is the first step in promoting a healthier, safer, and more efficient workforce. Better information about MSDs and an emphasis on improved safety and health can prevent many MSDs thereby reducing the associated financial costs, improving the quality of work life, and decreasing human suffering. The prevention of MSDs in the construction industry requires the cooperation of policymakers, construction management, labor organizations, individual workers, health care providers, and researchers.

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PREFACE

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