



The prevalence of self-reported musculoskeletal symptoms among loggers in Poland



Witold Grzywiński ^{a,*}, Artur Wandycz ^b, Arkadiusz Tomczak ^a, Tomasz Jelonek ^a

^a Poznań University of Life Sciences, Faculty of Forestry, Department of Forest Utilization, Wojska Polskiego 71A, 60-625 Poznań, Poland

^b University of Zielona Góra, Faculty of Biological Sciences, Prof. Z. Szafrana 1, 65-516 Zielona Góra, Poland

ARTICLE INFO

Article history:

Received 29 August 2014

Received in revised form

17 July 2015

Accepted 19 July 2015

Available online 1 August 2015

Keywords:

Musculoskeletal symptoms

Prevalence of MSDs

Nordic musculoskeletal questionnaire

Loggers

ABSTRACT

This paper presents an analysis of the occurrence of self-reported musculoskeletal symptoms (MSD) among loggers in Poland. As a diagnostic tool, a modified Nordic questionnaire was used. The questionnaire was completed by 353 professional loggers. The results showed the dominant MSD symptoms during the last twelve months to be those of the lower back (66.3%) and hands/wrists (left 50.1%, right 51.3%). A significant percentage of respondents also reported symptoms of the upper back (45.6%), shoulders (38.2% for each shoulder), and knees (left 36.0%, right 39.4%). Statistically significant relationships were found between the age of the subjects, the work experience, and the number of body regions in which MSD symptoms were reported during the last twelve months. These results show that education and recommendations to use safe working postures, techniques and organization of work with a chainsaw should still be improved.

Relevance to industry: This paper analyzes the prevalence of MSD symptoms among Polish loggers and provides a basis for the implementation of preventative measures.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

Musculoskeletal disorders are the most frequent occupational health problem. It is estimated that some 25% of employees in European Union countries (EU-27) complain of back pains, and 23% of muscle pains. In these countries, 62% of employees are exposed for at least one-fourth of their working time to repetitive movements of the hands and arms, 46% to painful and uncomfortable positions, and 35% to the carrying or movement of heavy loads (EU-OSHA, 2007).

In addition to the physical suffering of workers, musculoskeletal disorders cause significant economic and other costs for society as a whole. For instance, in the United States in 2013, musculoskeletal disorders accounted for 33% of all absence from work due to sickness (BLS, 2014). The direct and indirect costs of musculoskeletal disorders in 2007 were estimated at US\$2.6 billion (Bhattacharya, 2014). In Germany, musculoskeletal disorders are the reason for 23.7% of lost working days (95 million), and the resulting losses are estimated at €23.9 billion, equivalent to 1.1% of GDP. Austrian research has found the losses caused by MSDs to be 2.1–3.1% of GDP

(EU-OSHA, 2010).

In Poland, diseases of musculoskeletal system are the third most frequent cause of absence from work due to sickness. In 2013 they were the reason for over 29 million days of absence, accounting for 13.7% of all absences (ZUS, 2014). The average length of medical leave granted due to musculoskeletal problems was close to 14 days. In the USA in 2013 MSD disorders caused one-third of all days-away-from-work, and the average rate of days-away-from-work was 35.8 (BLS, 2014). In the UK, the total number of MSD cases in 2013/14 was 526 000 out of a total of 1 241 000 for all work-related illnesses. The total number of working days lost due to MSDs in 2013/14 was 8.3 million, an average of 15.9 days per case of MSDs (HSE, 2014).

Manual workers are particularly at risk of developing musculoskeletal disorders. The European Agency for Safety and Health at Work (EU-OSHA) lists employees of the farming, forestry and fishing sectors first among the occupational groups with a particularly high MSD risk (EU-OSHA, 2007). Work in the forestry sector, and in particular the harvesting of timber, is generally considered one of the most onerous types of manual work (Åstrand et al., 2003; ILO, 1998). In Poland, about 37 million cubic meters of timber are harvested annually, over 80% of it by loggers using a chainsaw (Forestry, 2013). It is estimated that more than 10 000 persons work

* Corresponding author.

E-mail address: witold.grzywinski@up.poznan.pl (W. Grzywiński).

in this profession (Grzywiński, 2011). Because of limitations of fully-mechanized timber harvesting in Poland and other countries of central, eastern and southern Europe, reducing workload and MSD symptoms among loggers is still a prevailing issue.

The work done by loggers causes them to be exposed to numerous MSD risk factors. The most important of these include a high degree of physical strain, moving heavy weights, and working in forced and awkward body postures (Hagen, 1990; Harstela, 1990; Hulse and Gunstone, 1998; Grzywiński and Bujnowska, 2009). The use of a chainsaw also causes exposure to hand-transmitted vibrations (Bernard, 1997; Bovenzi et al., 1991; Mirbod et al., 1992; Nagata et al., 1993) and to unfavorable weather conditions (Hildebrandt et al., 2002), which also contribute to the development of musculoskeletal problems.

The musculoskeletal disorders most frequently recorded among loggers relate to the lower back, the hands and wrists, and the knees (Ashby et al., 2001; Gallis, 2006; Hagen et al., 1998; ILO, 1991; Pontén, 1988; Sairanen et al., 1981). Pilot research carried out on a group of 77 Polish loggers (Grzywiński et al., 2010) confirmed that symptoms of the lower back, hands, shoulders and knees were dominant among those reported. The frequency of MSDs would increase after work was finished, in particular for the hands, upper back, shoulders and knees. The highest proportions of reported symptoms were those recorded for the lower back, both before and after work: 40.0% and 56.0% respectively.

No detailed research has yet been carried out in Poland relating to the prevalence of MSDs among loggers. Considering the high risk of MSDs in that profession, the increase in timber harvesting and the relatively slow introduction of fully mechanized technologies, the investigation of this problem is of great importance. The purpose of this study was to evaluate the frequency of occurrence of MSD symptoms among Polish loggers and the impact of some factors (age, work experience) on the prevalence of MSDs. This will provide a basis for the development of practical solutions to reduce the risk of development of MSD symptoms among loggers.

2. Materials and methods

2.1. Study design

A standardized questionnaire was used to investigate the prevalence of self-reported MSD symptoms among 353 Polish loggers. This cross-sectional survey was conducted on a random group of participants across Poland. First, forest divisions were randomly selected and then loggers employed in private enterprises operating in these forest divisions' areas were surveyed. The surveyed loggers were employed in 52 private enterprises operating in 28 forest districts. Individuals who were employed for less than half a year were not included in the study. The survey was conducted individually in the workplace during working hours. The participants completed the survey voluntarily.

2.2. Participants and characteristics of loggers' work

The research involved 353 male loggers employed mostly by private professional forestry companies. According to Polish law only males may work as a logger due to very high energy expenditure in this line of work. All participants were between 19 and 64 years old. Their work experience as loggers ranged from half a year to 38 years. All of them held a professional logger's license. Detailed demographic information is given in Table 1.

The duties of a logger include felling trees, delimiting and bucking, using a chainsaw. Short logs (less than 3 m long) are then stacked. Loggers work on their own or with an assistant, whose work primarily involves gathering and stacking the short logs.

Table 1
Demographic and employment characteristics of loggers (n = 353).

Variable	Mean (standard deviation)	Range	Distribution
Age (years)	39.6 (11.0)	19–64	≤29: 22.7% 30–39: 26.1% 40–49: 30.8% 50–59: 18.4% ≥60: 2.0%
Height (cm)	176.5 (6.4)	158–194	≤170: 20.7% 171–180: 55.5% >180: 23.8%
Weight (kg)	83.2 (11.3)	56.5–125	≤70: 15.9% 71–80: 30.0% 81–90: 33.1% >90: 21.0%
BMI (kg·m ⁻²)	26.70 (3.34)	18.7–40.9	18.5–24.9: 32.6% 25.0–29.9: 51.0% 30.0–34.9: 14.7% ≥35.0: 1.7%
Work per day (h)	6.84 (1.50)	4–10	<6: 45.3% 6–8: 48.8% >8: 5.9%
Work per year (months)	9.37 (2.61)	5–12	<6: 19.5% 6–9: 33.7% 10–12: 46.8%
Forest work experience (years)	12.3 (9.2)	1–42	≤1: 6.8% 2–5: 21.2% 6–10: 26.1% 11–15: 15.3% 16–20: 11.3% >20: 19.3%
Work with chainsaw experience (years)	9.8 (7.8)	0.5–38	≤1: 14.2% 2–5: 24.9% 6–10: 26.4% 11–15: 13.0% 16–20: 10.2% >20: 11.3%

During the week preceding the research the loggers had worked on harvesting timber in thinning operations (70.0%) and clear cutting (22.4%), predominantly in pine forests. In most cases the loggers themselves regulated the length of their working day and the distribution and length of rest periods.

2.3. Questionnaires and data collection

The research used a modified version of the Nordic Musculoskeletal Questionnaire (NMQ) (Kuorinka et al., 1987), translated into Polish by the authors. The NMQ is widely used to assess self-reported MSD symptoms (Widanarko et al., 2011; Collins and O'Sullivan, 2015). The first part of the questionnaire contained questions relating to demographic features: age, height, weight, hand dominance and years of practice. The second part related to the occurrence of disorders (pain, ache, discomfort) in particular regions of the body: neck, upper back, lower back, shoulders, elbows, hands/wrists, hips/thighs, knees, and feet/ankles. The original version of the NMQ does not distinguish a left-right division of lower limbs. The work performed by loggers requires constant movement and awkward posturing of legs (strongly bent, squatting, kneeling), so we modified the questionnaire and introduced a left-right division of lower limbs.

The participants were informed about the purpose of the research and how the results will be used. They were also assured that all the data would remain confidential. All signed an individual consent for the participation in the survey.

Each logger was interviewed individually by authors. The participants were asked about demographic details and subsequent information on their work. After the interview, the participants

Download English Version:

<https://daneshyari.com/en/article/1095886>

Download Persian Version:

<https://daneshyari.com/article/1095886>

[Daneshyari.com](https://daneshyari.com)