



Musculoskeletal disorder prevalence and psychosocial risk exposures by age and gender in a cohort of office based employees in two academic institutions



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ABSTRACT

This study presents data on self-reported prevalence of Musculo-Skeletal Disorder (MSD) symptoms and psychosocial risk exposures by age and gender among a group of office based University workers who use their computers for at least 25% of their workday. Employees in two academic organisations received an invitation to participate in an on-line questionnaire. A total of $n = 852$ office workers participated in this study; yet respondents who were employed for greater than 12 months were only included in the study cohort. Furthermore, participants were only considered for further analysis if they spent 50% or more of their workday in their office, and of this time at least 50% was spent on computer work ($n = 569$). The study indicates that self-reported symptoms of MSDs for these workers were highest in the neck, shoulder and lower back. Neck, shoulder and back MSDs were higher for females than males, yet age differences within genders were not evident for these symptoms. For neck disorders, symptomatic individuals reported significantly higher levels of office work ($p < 0.05$) and PC usage ($p < 0.005$), and significantly lower levels of job content ($p < 0.01$), job demands ($p < 0.05$), and work environment ($p < 0.05$) compared to asymptomatic participants. For the shoulder, symptomatic individuals exposure levels were significantly higher for office work ($p < 0.05$) and PC usage ($p < 0.05$) and significantly lower for job content ($p < 0.05$) compared to asymptomatic individuals. There was evidence of important differences in the psychosocial exposures between age and genders, but associations between these differences and MSD symptoms were not present.

Relevance to industry: This study presents prevalence data on age and gender differences in self-reported symptoms of MSDs and psychosocial risk exposures in a group of sedentary workers.

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1. Introduction

In 2010, The European Agency for Safety and Health at Work (OSHA) reported that Musculo-Skeletal Disorders (MSDs) were the most common work related health problem in Europe, affecting millions of workers. They stated that the size of the problem is likely to increase as exposure to work related risk factors for these conditions is increasing within the European Union (OSHA, 2010). Estimates of the cost of these problems are

confined, however where data does exist the cost has been estimated at between 0.5% and 2% of Gross National Product (GNP) (Buckle and Devereux, 1999). Looking at it over a one year period, in 2000 OSHA reported that an estimated 350 million working days were lost due to work related diseases in Europe (OSHA, 2004). The HSE (UK) published results for a 12 month period between 2004/2005 and declared that an estimated 28.4 million working days were lost due to work related neck, shoulder, and back disorders. On average, each person suffering from these disorders took an estimated 23 days off work in that 12 month period, with an estimated cost to the economy of £5.7 billion. Averaged across the working population this represents an annual loss of 1.2 days per worker (HSE, 2006).

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Industrialised countries, especially nations in the European Union (EU) are facing unprecedented demographic changes that will have a major effect on various aspects of society. People are living longer and older people are enjoying better health and lifestyles. By 2030, the number of older workers (55–64 years) will have risen in the EU by 24 million as the baby boomer generation become senior citizens. From 2005 to 2030 the number of people 65+ will rise by 52.3%, while the age group of 15–64 will decrease by 6.8% (EU, 2005). The ratio of dependent young and old people to people of working age will increase from 49% in 2005 to 66% in 2030; consequently to offset the loss of working age people there will need to be an employment rate of over 70%.

The ageing population gives rise to a particular challenge in ergonomics since the prevalence of MSDs generally increases with age; by their mid 30s most people have experienced their first episode of work related MSD, usually in the form of back pain (Bernard, 1997). As a person ages their resilience to MSDs decreases, with the loss of tissue strength leading to higher severity and a more frequent onset of soft tissue damage (Bernard, 1997). Due to reduced resilience it has been shown in several studies that age is an important factor associated with MSDs (Guo et al., 1995; Soares et al., 2003; Parsons et al., 2007; Collins and O'Sullivan, 2010; Heiden et al., 2013). Musculoskeletal impairments are among the most prevalent and symptomatic health problems of middle and old age (Buckwalter et al., 1993). In some studies results have indicated that females are more predisposed than males, especially in the upper limbs (Cook et al., 2000). One notable exception is a survey by Widanarko et al. (2011) which didn't find age differences across nine occupational groups ranging from heavy to light physical activity.

Over the last decade the landscape of the European Labour force has changed considerably. The employment rates for females in the workforce increased by 4.8%, over the years 1995–2005 compared with a rise of only 1.1% for males. In addition the total gender gap in employment across the EU nears a 15% difference (Eurostat, 2007). The role of gender in relation to MSDs, particularly back ache, muscular pain, and upper extremity, has been widely examined in medical, epidemiological, and psychological literature. Treaster and Burr (2004) conducted a review to determine the strength of support for the hypothesis that women experience higher prevalence of MSDs than males. Even after controlling for confounders' such as age and work factors the findings suggested that females had significantly higher prevalence than males for many types of MSDs. Widanarko et al. (2011) performed a telephone survey of MSD prevalence across nine occupational groups involving 3003 males and females and found that generally, there wasn't an age effect but there was a gender effect (with rates higher, especially for the neck, shoulders, wrist/hands, upper back and hips/thighs/buttocks than males). de Zwart et al. (2000) tested the hypothesis that the higher risk of MSDs for females could partly be explained by differences in the distribution of genders in occupations with different risks for the onset of MSDs. The hypothesis was rejected on the grounds that females showed increased risks, after occupational class was adjusted for, in the neck, shoulder, elbow, and wrist.

Occupational risks that are synonymous with sedentary workplaces include exposure to computer work, reduced activity levels, and psychosocial aspects. Whether these risks increase the susceptibility for a specific gender or age group to MSD symptoms is

still unknown. Much MSD research (Widanarko et al., 2011; Heiden et al., 2013) does not include details on both activity levels and psychosocial risk exposures which are recognised as being of increasing importance for shoulder, neck and lower back MSDs. Notwithstanding the level of research available which investigates age and gender differences in MSD susceptibility there is unclear evidence on the profile of MSD prevalence associated with such risk exposures.

Therefore, the aim of this paper was to expand our understanding of MSD symptoms by investigating age and gender-related MSD prevalence, and associations with activity levels and psychosocial risk exposures, across working age male and female office based employees.

2. Method

2.1. Study design

This was a cross-sectional survey of 852 office based employees in two higher education academic institutions in the Republic of Ireland. The investigations were based on questionnaire data collected through an online survey. The survey was designed to identify age and gender-related associations to MSD symptoms.

The questionnaire also surveyed various physical and psychosomatic aspects of work, including the psychosocial risk factors in sedentary occupations, and reports of MSD symptoms. It specifically studied autonomy, job demands and environmental support.

Furthermore, the exposure of office based employees to PC use and the level of work, physical and leisure activity was also captured.

2.2. Participants and inclusion criteria

A total of ($n = 852$) individuals completed the on-line questionnaire. Inclusion criteria were then applied to the data:

1. Individuals who were employed for less than one year were not included due to exposure requirements. This reduced the sample size to $n = 709$. As to control for exposure to certain occupational tasks during estimation of MSD symptom prevalence the survey cohort was filtered further.
2. Participants were only considered for further analysis if they spent 50% or more of their workday in their office, and of this time at least 50% was spent on computer work. This reduced the sample size to $n = 569$.

2.3. Ethics

All parts of the questionnaire were approved by the Ethics Committee, University of Limerick, Ireland (file no. S&E 09/19).

2.4. Questionnaire design

A modified and expanded version of the questionnaire used in Collins and O'Sullivan (2010) was used in this study.

Section (A) of the survey was based on the Nordic Musculoskeletal Questionnaire (NMQ) (Kuorinka et al., 1987). The NMQ has been widely used in epidemiological studies of various

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