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Prevalence of back pain problems in relation to occupational group

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ABSTRACT

Work Related Musculoskeletal Disorders (WMSDs) constitute a persistent and ongoing public health problem in the active work population. The aim of this paper is to analyze the relationship between work-related physical and psychosocial factors and the occurrence of back pain symptoms related to the occupational group (blue and white collar workers). One thousand, four hundred, and fifty-eight workers from different sectors and socio-professional categories have participated in this study (44.5% men and 55.5% women; 24.3% blue collar workers and 75.7% white collar workers). Data was collected by the INSAT (Work and Health Questionnaire). A quantitative overview was adopted with the use of logistic regression models. The analysis was stratified for each occupational group. Apart from factors of great environmental and physical constraint, other less visible aspects played a role in the occurrence of back pain problems, namely factors linked to work organizational options, relationships with others and some specific work characteristics. Thanks to the present study it was possible to show the interaction between physical factors and psychosocial factors in both occupational groups and thus highlight the specific conditions which cause these problems in both groups of workers.

1. Introduction

Work Related Musculoskeletal Disorders (WMSDs) constitute an important public health problem in the active work population (Cole et al., 2005; Eatough et al., 2012; Wind et al., 2005). Nevertheless, it is not considered an "emergent" health problem. Some studies in the 1990s suggested that working with computers was associated with the development of a vast array of WMSDs, namely in the back, neck and upper limbs (Armstrong et al., 1993; Ong et al., 1995). It is therefore a persistent and ongoing health problem. Meanwhile, knowledge of the evolution of its determinant factors, namely its association with psychosocial factors has been given greater attention over the last few years, due to changes in the world of work (David et al., 2008; Govindu and Babski-Reeves, 2012; Mardon et al., 2013; NIOSH, 1997; Stock et al., 2013), and its interaction with well known physical risk factors. Nevertheless, despite a greater knowledge of the occurrence of WMSDs and their causes, there has not been increased action (Mardon et al., 2013). WMSDs still occupy a top place in the record of occupational diseases in Europe and remain one of the priorities on the agenda in the occupational health and safety field, stated by the European Agency for the years between 2013 and 2020 (European Agency for Safety and Health at Work, 2013).

Therefore, it is crucial to organize work and to design workplaces in such a way that would prevent the occurrence (or the aggravation) of these disorders and where more employees would be able to work until their usual retirement age. Nevertheless, we cannot simply rely on statistical indicators of the prevalence of the disorders, when they have reached such a persistent and irreversible state which has been clinically diagnosed. It is necessary to develop suitable analytical tools able to identify occasional complaints that could indicate an infra-pathological state. Therefore, it is necessary to distinguish between musculoskeletal disorders and clinical signals, as well as musculoskeletal symptoms (Widanarko et al., 2011). In this paper we will mostly focus on the latter. For this reason, we have concentrated on self-reported measures and avoided relying exclusively on statistics, as if the numbers "spoke for themselves" (Mardon et al., 2013), while complementing with the analysis of the tasks performed in a real work context.

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Amongst the most frequent musculoskeletal complaints (whether persistent or more serious, as well as considering the different occupations), low back pain is one of the most prevalent (Eatough et al., 2012; Govindu and Babski-Reeves, 2012; Marras, 2005; Silverstein and Adams, 2007; Widanarko et al., 2011). It is also one of the main causes of disability and sick-leave (European Agency for Safety and Health at Work, 2007; Katz, 2006).

Although the individuals' differences associated with back pain are recognized, it is a fact that certain occupational groups may have an increased risk due to their working conditions and the constrains imposed by their jobs. Furthermore, according to Waddell and Burton (2001) there is strong epidemiological evidence that physically demanding work – awkward postures, repetitive work, lifting heavy loads, standing up for long periods of time and exposure to vibrations – can be related to increased reports of low back pain symptoms. Specifically, blue-collar workers have higher physical work demands that are generally considered to be the main cause of musculoskeletal pain and work disability (Jørgensen et al., 2013).

Although the influence of physical work is undeniable, other psychosocial risk factors also play a determinant role in the prevalence of WMSDs. In order to emphasize this relationship and its multifactorial nature, this study aims to analyze the relationships between work-related physical and psychosocial factors and the occurrence of back pain problems in the occupational group (blue and white collar workers).

2. Material and methods

2.1. Participants

The sample was composed of 1458 Portuguese workers from the North and the Center of the country, as well as Lisbon and the Tagus valley regions, with a response rate of 99%. The sample included nine economic sectors: (a) Health and Social Support; (b) Education; (c) Wholesale and Retail; (d) Manufacturing Industry; (e) Water Collection, Treatment and Supply, Sanitation and Waste Collection and Treatment; (f) Transport, Storage and Communications; (g) Real Estate Activities – management of municipal districts; (h). Public administration and defense; (i) Other service activities.

2.2. The tool and procedures

Data collection was obtained through the INSAT (Barros-Duarte and Cunha, 2010) questionnaire. The INSAT is a Portuguese survey that allows us to "understand how workers evaluate their work characteristics and conditions, their health state, and the nature of the relationships they establish between their health and work" (Barros-Duarte et al., 2007, p. 59). The INSAT is organized into different sets of questions. First, a set of question focuses on the job description in terms of the nature of work, type of contract, working hours and shifts. After this introductory part, another group of questions, divided into 4 sections, allows for the identification of the constraints and characteristics of work that are perceived by the workers, when exposed (affirmative answers), namely, (1) environmental (10 questions) and physical (9 questions) constraints, (2) organizational (20 questions) constraints, (3) relationship (17 questions) constraints, and (4) work characteristics (18 questions). Two other sets of questions broach the effects of work on health. One of them corresponds to the Portuguese version of the Nottingham Health Profile (NHP) (Ferreira and Melo, 1999) and the other set corresponds to a list of common health problems which includes amongst others: back pain, headache, respiratory, heart and vision problems and musculoskeletal disorders.

Besides a more traditional cause-effect approach, between exposure to certain work risk factors and the clinically diagnosed diseases, this survey also allows another type of approach, thus adding a subjective dimension to the work–health relationship. Therefore, the little health problems and the complaints which really affect the workers' well-being and quality of life can also be investigated with this tool. This is the main reason why the survey is self-reported: to evaluate the workers' perceptions of the effects of the working conditions on their health and well-being. The data collection was conducted between 2010 and 2014. Confidentiality of the data collected and the anonymity of participants were ensured. All participants gave their signed informed consent to participate.

2.3. Variables

The dependent variable in this study was the affirmative answer to the question: "… *having back pain problems*". As independent variables the following work conditions were considered: *being exposed to environmental conditions* (noise, vibration, intense heat or cold, etc.), *physical conditions* (repetitive gestures, awkward postures, heavy physical efforts, etc.) *organizational conditions* (*pace*, interruptions, dependent on others, autonomy to define schedules, breaks, etc.) *and relationship* with leadership, colleagues (occupational support, aggression, integration into/share decisions, etc.) and customers (deal with demands, tensions, aggressions, etc.) *constraints,* and *work characteristics* (in terms of nature of work, satisfaction, recognition, career, etc.). As the independent variables were nominal, they were recorded according to the workers' answers, that is, if a condition was reported for an actual work situation or both (actual and past), value 1, or if it had never been verified or only in the past, value 0.

Stratified data analysis was carried out considering two groups – the blue collar and the white collar workers group. Group classification was conducted in accordance with the Portuguese Professions Classification 2010 (Instituto Nacional de Estatística, 2011) based on the International Classification Systems for Occupation (ISCO88 and ISCO08) which was adopted by the European Foundation for the Improvement of Living and Working Conditions (Eurofound) for the 2010 European Working Conditions Survey (Gallup, 2010). The blue collar group combined the various professions in the manual workers categories (major groups 6, 7, 8 and 9); and the white collar group combined the professions integrated in the clerical workers categories (major groups 1, 2, 3, 4 and 5). Also, socio-demographic parameters were considered for sample characterization purposes namely, gender, education, age, seniority, and the work sector belonging to.

2.4. Data analysis

The exclusion criteria of the sample were for answers to be missing in at least one third of the questions, to be self employed, and failure to answer the question *having back pain problems*.

Descriptive statistics were used to determine the central tendency parameters for scale variables (mean, standard deviation and median) and relative frequency of the nominal variables allowing the sample's characterization.

The nominal variables were integrated in a bivariate logistic analysis -enter method-in order to examine the association between physical, organizational, and social work conditions and characteristics and the back pain problems, into each occupational group (blue collar and white collar workers).

The variables that showed significant associations in the bivariate approach were subsequently integrated into a multi-factorial logistic analysis -backward conditional method-; confidence