Work-related musculoskeletal disorders in home care nurses: Study of the main risk factors

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ABSTRACT

Background: Nurses are a risk group for work-related musculoskeletal disorders (WMSDs). Several studies reveal that nurses have high prevalence rates of injuries and symptoms related to WMSDs. However, many of these studies focus mostly on hospital nurses. Worldwide, few studies include home care nurses.
Objective: This work aimed to identify the body region most affected by musculoskeletal complaints in home care nursing, and subsequently develop a statistical model, that includes the main risk factors, to predict the risk of having musculoskeletal complaints in the identified region.
Methods: The research method was based on the Standardised Nordic Questionnaire applied to home care nurses working at Health Centres of northern Portugal. Univariate and multivariate models of logistic regression were used to meet the goals of this work.
Results: Home care nurses have a three times greater chance of having lumbar complaints than their counterparts working only at Health Centres (OR = 3.19 (p < 0.05), with a 95% confidence interval [1.256; 8.076]). A statistical model with seven variables (forearm posture; static postures; arm posture; arm supported; bed height; job satisfaction; assistive devices) was obtained to predict lumbar complaints.
Conclusions: The lumbar region was identified as the most affected by musculoskeletal complaints. These complaints were associated with seven factors.

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1. Introduction

Work-related musculoskeletal disorders (WMSDs) have been described as the most important occupational health problem affecting nurses (Barroso et al., 2007; Smith et al., 2006). The high prevalence rates of musculoskeletal symptoms and injuries in nurses confirm this claim (Barroso et al., 2007; Alexopoulos et al., 2006, 2011; Barroso and Martins, 2008; Daraiseh et al., 2010; Smith and Leggat, 2003; Smith et al., 2004; Trinkoff et al., 2003b; Yip, 2001). In fact, caring for people is considered a risky activity by some authors, as it is associated with high prevalence of musculoskeletal complaints, mainly in the back (Barroso et al., 2007; Alexopoulos et al., 2006, 2011; Daraiseh et al., 2010; Menzel, 2004). It is very important to reduce back complaints in nurses as those may lead to physical suffering, greater absenteeism, and also to an early retirement. Also, symptoms in the lumbar

region can lead to symptoms in other body regions (Daraiseh et al., 2010).

Most studies about this topic have been carried out in hospitals, nursing homes and other institutions. Information regarding WMSDs in home care nurses worldwide is scarce (Davis and Kotowski, 2015). Still, there are few studies dedicated to WMSDs in nurses, especially comparing nurses in home care with nurses in hospitals and nursing homes.

Some studies indicate that injuries and musculoskeletal disorders in the back and other body sites constitute a serious problem for professionals who provide home care, namely nurses and nursing assistants (Brulin et al., 1998; Cheung et al., 2006; Knibbe and Friele, 1996; Meyer and Muntaner, 1999; Ono et al., 1995; Pohjonen et al., 1998). A study involving a comparative analysis of musculoskeletal disorders between Greek and Dutch nursing personnel in hospitals and nursing homes suggested that work in both situations entailed similar risks. However, the nursing home environment may entail more risks, as is less controlled and standardised (Alexopoulos et al., 2006). Following that reasoning, one can suppose that home care provision may lead to an even

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higher risk since patients' homes are an even less controlled work environment without any pattern (Galinsky et al., 2001). Home care nursing has specific characteristics, such as cramped spaces, misfit working surfaces (too high or too low), inappropriate furniture, and other adverse working conditions that may determine the adoption of risk behaviours (Carneiro et al., 2015). According to Szeto et al. (2013), due to the restrictive environment found in patients' homes, home care nurses often have to work in awkward postures.

However, a study reported that there is less risk of WMSDs for nurses that provide home care when compared with those working in hospitals or nursing homes (Simon et al., 2008). That study compared nursing staff from seven European countries and from different institutions (hospitals, nursing homes, and home care providers) to evaluate their exposure to physical and psychosocial risk factors associated with disabilities related to back or neck pain. These two risk factors were less found in home settings. Kromark et al. (2009). obtained similar results. A study comparing nursing staff from nursing homes and nurses from home care revealed that the first reported disorders in the cervical or lumbar region more often.

Due to the scarcity of studies and information on WMSDs in home care nurses, this paper aims to provide information on WMSDs and related complaints regarding home care nurses working in Health Centres of northern Portugal. The objectives of this study were to identify the body region most affected by musculoskeletal complaints in the practice of home care nursing, as well as to develop a statistical model including the main risk factors to predict the risk of having musculoskeletal complaints in the identified body region.

2. Materials and methods

2.1. Questionnaire

The authors developed an electronic questionnaire to gather the information for the study and tested it previously in a specific group of nurses. The questionnaire (Carneiro, 2012) was based on the Standardised Nordic Questionnaire (SNQ) (Kuorinka et al., 1987) for the analysis of musculoskeletal symptoms. The SNQ is one of the most used self-assessment questionnaires for the characterisation of WMSDs. Several questions were added to allow collecting more information, applying statistical techniques for identifying the largest possible number of WMSD risk factors, and evaluating their impact on the appearance of musculoskeletal complaints. The adjustments and the new questions specifically addressed to home care nurses are described below. The complaints and symptoms collected by the questionnaire were analysed to identify risk factors for WMSDs since they are a good predictor of subsequent WMSDs (Smith et al., 2009).

In Primary Health Care there are nurses that only provide care in Health Centres and others that additionally provide home care nursing. The home care nurses had to answer a total of 105 questions, while those not providing home care only had to answer 59 questions.

The questionnaire was divided into four parts, as described by Carneiro et al. (2010). Parts A and B are an adaptation of the Standardised Nordic Questionnaire (Kuorinka et al., 1987), while parts C and D only include questions related to tasks developed in patients' homes. Part A includes demographic and professional characterisation, including an important question to distinguish nurses who only provide care in Health Centres from those who also provide home care. Part B includes the identification and characterisation of musculoskeletal complaints and symptoms from the past twelve months, concerning nine body regions (cervical, shoulders, elbows, wrist/hand, dorsal, lumbar, thighs, knees,

and ankles/feet). Part C addresses the number of week hours dedicated to the home care and the most frequently performed activity during the provision of home care from a pre-established list. Regarding this activity, nurses had to answer a set of questions based on the technique of postural analysis (REBA) (Hignett and McAtamney, 2000), thus revealing their perception of the postures (for the six body segments evaluated by REBA) they adopted during the most frequent home care activity. REBA is an observational assessment method but, in this specific case, it was only used as a basis for the questions. Part D contains questions related to various other aspects, namely some physical and psychosocial factors. The suitability of the bed height and other workplace characteristics (organisation, hygiene, and availability of patient handling aids) are examples of physical factors. The psychosocial factors are associated with work-related stress and the personality of the nurse (anxiety or irritability), as well as organisational aspects such as taking breaks during the work shift and time pressure.

The validity of parts C and D was performed using a panel of experts which explored the theoretical construct. The reliability was done by test-retest on 20 nurses, with total agreement.

2.2. Sample

The questionnaire was distributed by email to the Health Centres of northern Portugal, indicating that they should be filled only by nurses. The total number of respondents was 222 in a universe of 2763 (ARSN, 2011) (response rate of 8%). Only the complete responses (n = 147) were taken into consideration in this study. About 87% of the nurses were female. The average age was 35.7 years (SD = 8.88) and the average seniority in the profession was 12.8 years (SD = 8.39). Approximately 85% (125) of the respondents provided home health care. The remaining 15% (22) worked exclusively in Health Centres.

2.3. Statistical technics

The information from the questionnaire was statistically analysed with IBM® SPSS® Statistics version 21.0.

In order to estimate the WMSD risk in the practice of home health care, univariate models of binary logistic regression were used. In this process, "provide home care" (or not) was the factor used to evaluate the association with musculoskeletal complaints in the different body sites. Based on these results, and considering the body region most affected by home care practice, logistic regression was applied to predict the risk factors that could contribute to the onset of complaints in the nine body regions.

3. Results and discussion

3.1. Data analysis

The body sites associated with higher prevalence of complaints were the back (cervical = 73.5%; lumbar = 64.6%; dorsal = 49.0%) and the shoulders (49.0%). These values are somewhat consistent with those of previous studies carried out in both a hospital context and a home care setting that also used questionnaires based on the Standardised Nordic Questionnaire (Barroso et al., 2007; Cheung et al., 2006; Knibbe and Friele, 1996).

The association between "provide home care" and "have complaints in any body region" was measured by odds ratio (OR) and respective confidence intervals (CI), using binary logistic regression models. Only the lumbar region revealed a statistically significant association (OR = 3.19, $p < 0.05$, 95% CI 1.26—8.08), as shown in Table 1. This finding means that nurses who provide home care are