

Prevalence and symptomatology of musculoskeletal problems reported by home care service workers caring for the elderly

Dina Chagas ^a

^a Higher Institute of Education and Sciences, Lisbon, Portugal. dina.chagas2003@gmail.com

Received: November 30th, 2015. Received in revised form: April 07th, 2016. Accepted: April 12th, 2016.

Abstract

Work-related musculoskeletal disorders (WRMSDs) develop gradually and result from professional risk factors such as the repetition of tasks, emotional overburden, inadequate posture, excessive strain, and individual and organizational/psychosocial risks. The aim of this study was to identify prevalence and symptomatology of musculoskeletal problems reported by home care service workers caring for the elderly. The Nordic Musculoskeletal Questionnaire was used for the purpose. The sample contained 86 workers. The results show a high prevalence of musculoskeletal symptoms in different anatomical areas, affecting in particular the upper limbs and the lumbar, dorsal and cervical areas. There are also some important associations between the dorsal area and the lifting of patients weighing above 90 kg. It may be concluded that these workers run a considerable risk of acquiring musculoskeletal injuries as a result of their working conditions and from the ways in which their activities are currently performed.

Keywords: work-related musculoskeletal disorders; prevalence; symptomatology; home care services

Prevalencia y sintomatología músculo-esquelética auto-referida por los trabajadores del servicio de apoyo domiciliario en la prestación de atención a personas mayores

Resumen

Las lesiones músculo-esqueléticas relacionadas con el trabajo se desarrollan gradualmente y resultan de los factores de riesgo profesionales como la repetitividad de las tareas, sobrecarga emocional, postura inadecuada, aplicación de fuerza excesiva y de factores de riesgo individual y organizacionales/psicosociales. El objetivo de este estudio es identificar la prevalencia y sintomatología músculo-esquelética auto-referida por los trabajadores del servicio de apoyo domiciliario en la prestación de atención a personas mayores a través de una adaptación del Cuestionario Nórdico Músculo-esquelético. La muestra fue constituida por 86 trabajadores. Los resultados evidencian una prevalencia elevada de síntomas músculo-esqueléticos en diferentes zonas anatómicas, alcanzando en particular los miembros superiores, zona lumbar, zona dorsal y la zona cervical. También se encuentran asociaciones significativas entre la zona dorsal y levantar utentes con pesos superiores a 90 Kg. Podemos concluir que estos trabajadores tienen un considerable riesgo de adquirir lesiones músculo-esqueléticas resultantes de las condiciones de trabajo y de la organización en la que se lleva a cabo la actividad.

Palabras Clave: lesiones músculo-esqueléticas relacionadas con el trabajo; prevalencia; sintomatología; atención en domicilio

1. Introduction

The symptoms of work-related musculoskeletal disorders (WRMSDs) include chronic pain that can affect one or more body area during an activity [1]. WRMSDs are the

commonest occupational pathologies in the European Union (EU), affecting workers in all sectors.

In Portugal, the body responsible for health care, the *Direcção-Geral da Saúde*, reports that these injuries are the result of high risk occupational actions, such as repetition,

How to cite: Chagas, D., Prevalence and symptomatology of musculoskeletal problems reported by home care service workers caring for the elderly. DYNA 83(197), pp. 17-21, 2016.

overload and posture. They are chronic pain syndromes that occur while certain activities are performed, and are therefore designated “work-related” [1].

WRMSDs are extremely significant in the EU, as they affect more than 40 million workers and are responsible for around 50% of sick leave for periods of three or more days and 60% of cases of permanent incapacity for work [2].

The body areas most affected by WRMSDs are the lumbar region, neck, shoulder, arm and hand, although recently, the lower limbs have also received some attention [3].

The rate of disorders for workers providing direct care services to the elderly is 61%. They are caused by excess effort [4] and by daily tasks, including helping in personal hygiene tasks, changing clothing and bed linen, moving elderly clients, etc. [5]. These tasks carry a high risk of causing musculoskeletal WRMSDs whose development is exacerbated physically and biomechanically (repetition of movements, inadequate posture and excess effort), organizational and psychosocial factors (demanding work, repetitive movements, lack of support) as well as individual and personal factors (previous medical history, physical abilities, age and obesity) [6].

The continuous lifting of weights, the movement of heavy items (as most clients are dependent), as well as the imposed adoption of incorrect postures are all hazards that are present in the daily lives of workers, which lead to the appearance of critical and sometimes chronic injuries [7]. In order to be able to respond to the demanding tasks asked of them, workers frequently adopt incorrect postures an aspect that is exacerbated by conditions that are not suitable for the use of available equipment, given the anthropometric status of the workers [8].

WRMSDs develop, and are further aggravated, by the way daily tasks are organized and by psychosocial risk factors [9].

Physical and psychosocial factors are generally identified by studies undertaken to determine the risk factors for WRMSDs, allowing the relationship between them and of symptoms and/or illnesses to be analyzed [10].

A study undertaken by the European Survey on Working Conditions (2005), cited by the European Agency for Safety and Health at Work, identifies standing postures or uncomfortable positions, repetitive work and the manual handling of loads as the most significant risk factors facing workers [11]. The expression “risk factor” generally refers to any attribute, experience or behavior that increases the likelihood of developing a disease or disorder.

Musculoskeletal disorders manifest themselves clinically in many different ways that frequently are not considered. They often comprise an ample set of signs and symptoms, from simple localized fatigue to intense pain, passing through situations of discomfort and mild pain [12].

We may assert that WRMSDs that have developed or that worsen in the workplace, as a result of continued exposure to risk factors - in particular, inadequate posture, repetitive movements, overload, excessive effort and so on, all of which affect different anatomical regions.

2. Methodology

The sample consisted of employees of a home care service that provides care for the elderly in various

institutions of the central region of Portugal. In total, 90 survey questionnaires were distributed to workers from various institutions and 86 were returned in all, which constituted the final sample.

A statistical analysis was conducted using IBM® SPSS® Statistics 21.0 software. This took into account the nature of the variables involved in the study, based on a previous exploratory and analytical study of the data, and using the most appropriate statistical techniques.

First, the descriptive statistical analysis (mean, standard deviation, simple frequency, percentage) will be described, before turning to look at the relationship between the principal variables, symptom recognition and other elements that contribute to the presence of grievances using the Chi-Square statistic. The significance level assumed in the statistical test was $p < 0.05$.

The questionnaire was adapted from the Nordic Musculoskeletal Questionnaire developed by Kuorinka et al. (1987), using a version adapted by Uva and Serranheira [13], to which several questions related to home care service and caring for the elderly were added. The delivery and collection of information using the questionnaire was conducted during July 2014.

The questionnaire was divided into two parts. The first was intended to identify the main socio-demographic and professional characteristics of each worker. Among other things it requested data on age, gender, anthropometrics and other elements related to the organization of tasks performed by the worker. It also included information on the type and characteristics of work-related complaints and musculoskeletal symptoms of respondents. Complaints referred to nine body regions (neck, shoulders, dorsal region, elbows, lower back, wrists/hands, thighs, knees and ankles/feet) which were chosen to assess respondents’ self-reported pain/discomfort experienced over the previous 12 months and during the last seven days, and to ascertain whether, during this period of time, they had had to take time off from work. Each question had a diagram showing the body location to be evaluated.

Employee self-assessment was based on a scale that was used to register the intensity of pain, discomfort, swelling and fatigue. The scale had four levels: 1 = Light, 2 = Moderate, 3 = Intense, 4 = very intense. A four-level scale was also used to record the frequency of complaints and symptoms: 1 = Once a year; 2 = Twice or three times a year; 3 = Four to six times a year; and 4 = More than six times a year. To classify the workplace activities that were associated with symptoms and complaints a scale similar to a four point Likert scale was used, where: 1 = Not related to symptoms; 2 = Minor relation to symptoms; 3 = Strong relation to symptoms; 4 = Completely related to symptoms. When respondents did not know how to answer they could opt for choice 8 = “Don’t know”, and if they did not wish to respond at all, then option 9 = “I do not wish to answer” was available.

The second part of the questionnaire was intended to identify aspects considered relevant to the health of the works (psychosocial factors and auxiliary equipment used to increase client mobility).

3. Results

The study surveyed 90 employees of the home care

service provider for the elderly. The response rate was 96%. In terms of demographic and anthropometric variables, all the respondents were female (100%). Ages ranged between 20 and 60, though the largest cohort (accounting for 37.2% of the total sample) was aged between 41 and 50 years old. The most affected upper limb was the right arm (58.1%). Most individuals were married (61.6%) and the commonest education level was the 9th grade (59.3%).

The average height of the respondents was 161cm, with a maximum height of 180 cm and a minimum of 149 cm (standard deviation 0.06075). The average weight of participants was 68.6 kg, with a maximum weight of 110 kg and a minimum of 45 kg (standard deviation 10.727 kg). The majority were right handed (58.1%), while 5.8% were left handed and 36.1% ambidextrous.

It was found that the respondents work an average of 38.8 hours a week, with a minimum of 35 hours and a maximum of 42 hours (standard deviation 1.45 hours). Average length of service was 8 years, with a minimum of one year and a maximum of 19 years (standard deviation 4.666 years). 70.9% worked fixed hours, while 29.1% worked shifts.

In terms of pain, discomfort, swelling and fatigue- it was found that the most affected areas during the previous 12 months had been the lumbar region (86.0%), the dorsal area (82.6%), the neck (66.3%), the right shoulder (50.0%), the left shoulder (14.0%), the right wrist/hand (45.3%) the left wrist/hand (5.8%), the right knee (30.2%), the left knee (5.8%), the right elbow (24.4%), the left elbow (1.2%), the right ankle/foot (19.8%), the left ankle/foot (7.0%), the right thigh (15.1%) and the left thigh (1.2%).

During the previous seven days symptoms were felt as follows: the dorsal area (43.0%), the lower back (37.2%), the wrist/right and left hand (both 26.7%), the right and left shoulder (both 17.4%), the neck (16.3%), the ankle/right and left foot (both 12.8%), the right and left knee (both 11.6%), the right and left elbow (both 8.1%) and the left and right thigh (7.0%).

Values were also recorded relating to absence from work with the following symptoms, shoulders (8.1%), neck, lower back, ankles/feet (7.0%), dorsal area, wrist/hands (4.7%) and knees (1.2%).

In terms of intensity of discomfort (pain, discomfort, swelling and fatigue) the highest level of discomfort recorded (30.2%: "very intense") was reported for the lumbar area, against 24.4% for the dorsal area. The lumbar region (44.2%) and the dorsal area (34.9%) also scored highest for "intense". A value of 20.9% was recorded for "moderate" discomfort in the neck and 4.7% of respondents recorded "light" levels for the dorsal area.

Regarding frequency (number of times per year) 47.7% reported experiencing lumbar area pain/discomfort "more than six times" in the year, while 34.9% reported pain/discomfort "4-6 times".

In terms of the relationship between work activity and self-reported symptoms mentioned above, it was found that workers generally reported that activities such as lifting and moving clients weighing between 70 kg to 90 kg (and above) was "strongly related to symptoms". They considered arm movements above shoulder height and repeated arm movements to be "completely related to symptoms".

87.2% of the sample said that they felt psychologically

tired, in particular following the afternoon shift (75.6%). Respondents who reported feeling physical fatigue (95.3%), said they felt tired when a shift was over, in particular in the case of the afternoon shift (82.6%).

Regarding the repetition of tasks, 95.3% considered the lifting of clients to be the task that is repeated most frequently, while 52.3% indicated that they had difficulty moving while performing certain tasks for the client. 73.3% considered that bed height was not ideal.

As for the height of the boards used in the bath tubs, 62.8% answered "no" when asked if they were at a comfortable height, while 60.5% mentioned that they did not use specialized equipment to perform tasks, including the transport and movement of clients.

3.1. Statistical analysis of associations

The significant statistical associations between the work activities of home care workers caring for the elderly and musculoskeletal complaints were evaluated using the Pearson correlation test.

The strongest association between symptoms felt in the neck, was for the variable "arms above shoulder height" ($r = 0.432$, $p = 0.003$). This was categorized as having a "Strong relation to the symptoms" and proved to be statistically significant. In the same anatomical area other variables were also considered significant, such as "body tilt" ($r = 0.369$; $p = 0.003$) and "body twist" ($r = 0.395$; $p = 0.003$).

For the shoulder region "repetitive arm movement" ($r = 0.265$; $p = 0.000$) and "arms above shoulder height" ($r = 0.354$; $p = 0.000$) were identified as contributing most to symptoms, being considered "highly related to the symptoms".

For the wrist/hand area "repetitive hand/finger movements" ($r = 0.400$; $p = 0.003$), were identified as the element that contributed most to complaints, being identified as "totally related to symptoms". "Applying effort with hands and fingers" ($r = 0.448$; $p = 0.000$), was also regarded as "totally related to symptoms".

Within the dorsal column there were statistically significant connections between the variables "lifting clients weighing more than 90 kg" ($r = 0.366$; $p = 0.000$), which contributed most to the association, being considered "totally related to the symptoms". In this anatomical area the variable "moving clients weighing between 70 and 90 kg" ($r = 0.002$; $p = 0.000$) was also considered significant.

A statistically significant association was also found with the variable "length of time working for the institution" ($r = 0.868$; $p = 0.011$) in which the element that contributed most to reported symptoms was seniority of service: on average around eight years.

For the lumbar region, the variable "tilt the body" ($r = 0.077$; $p = 0.000$) was found to be statistically significant. There is a possibility of musculoskeletal injuries occurring in certain anatomical areas that related to different kinds of position or movement adopted in the course of the working day [14].

4. Discussion

The data presented here refers to a group of adult females,

most of whom have received the minimum level of education required by the law.

The results for symptoms reported by workers during the previous 12 months were as follows: lower back (86.0%), dorsal areas (82.6%), neck (66.3%), shoulders (64.0%) and wrist/ hands (61.0%). Symptoms reported for the previous 12 months were for the same body areas as those reported for the previous 7 days.

The evidence suggests that the symptoms felt in the neck and shoulders were caused by the adoption of positions required by work activities carried out by the respondents. That is: cervical flexion and elevation of the upper limbs, often above shoulder height. It is important to note that these symptoms are related to the duration and the rhythm of work performed.

As for work-related absence caused by WRMSDs, the commonest cause was pain/discomfort in the shoulder region (8.1%) and “very intense” pain in the lumbar region (30.2%).

The prevention of occupational risk and the eradication of musculoskeletal disorders might lead to reduced levels of absence from work [15]. In this connection, the area that led to the greatest number of days off due to pain/discomfort was the lumbar area (47.7%) with “more than 6 times”.

Most employees associated activities such as lifting and moving clients weighing between 70 kg to 90 kg and above, with the classification “completely related to symptoms”, demonstrating that they have to handle very heavy weights. Added to this, the majority (60.5%), mentioned not using proper equipment to perform tasks including when transporting or moving clients (Fig. 1). Respondents stated that, in general, clients to whom they provide home care assistance are dependent, and as a result are not in a position to help their carers when they are providing services.

The use of excessive effort during frequent lifting, handling and moving of clients, incorrect posture and vertebral column crunches can cause health problems for workers, including fractures, back pain and varicose veins [8]. Such causal factors are related to ergonomic factors [16].

Respondents characterized arm activity above shoulder level and repetitive arm movements as having a “strong relation to symptoms”.

The majority of employees (95.3%) considered that the lifting of clients is the most repetitive task, performed daily (Fig. 2). Usually, repetitive movements are principally associated with quick finger or upper limb movements [17].

The results of the survey showed that 52.3% of respondents encountered problems related to movement during the performance of the different tasks required to help their clients. This was because of the arrangement of furniture and the need to maneuver wheelchairs between beds, which need to be moved every time a task is required to be performed.

It was also noted that 73.3% of respondents considered the height of beds not to be ideal, or noted that it was not possible to adjust bed height, a factor that contributes to the adoption of incorrect postures (Fig. 3). Other factors mentioned included that beds tend to be quite close to walls, with the result that workers do not have enough space to perform their tasks properly. In terms of the height of bath tub boards, 62.8% of respondents reported that, as they are not adjustable, a lot of additional effort is required when

bathing clients.

To tackle the problem of musculoskeletal disorders a scheme of risk prevention management should be integrated into organizational management systems [18].

87.2% of respondents said that they feel psychologically tired at the end of their shift - 75.6% referring specifically to the afternoon shift. The psychosocial risks faced by workers include the issue of becoming emotionally overburdened as a result of continual contact with the suffering of clients, with pain and death, shift work, the pace of work, the performance of multiple tasks and the scattered and repetitive nature of their tasks. These factors may lead to headaches, breathing problems, sleep disturbance, depression, anxiety, alcohol-use and isolation [19].

Regarding physical tiredness, 95.3% of respondents reported feeling tired at the end of their shift - 82.6% referring specifically to the afternoon shift.

Several authors have argued that there is a strong link between psychosocial and physical factors associated with the job itself and to the development of WRMSDs [17].



Figure 1. Moving clients.
Source: the author.



Figure 2. Lifting clients.
Source: the author.



Figure 3. Lifting clientsup.
Source: the author.

5. Conclusions

This study aimed to identify the prevalence and symptoms of musculoskeletal disorders self-reported by workers and to determine whether or not there is a clear relationship between them and the work activity carried out.

After analyzing the data, it is clear that the assessment of pain/discomfort levels originating from the musculoskeletal system is related to work and the conditions under which it is performed. There is a high prevalence of upper body disorders and a significant connection between musculoskeletal symptoms and working postures involving the raising of the arms above shoulder height and of lifting clients who weigh over 90 kg. This is because the moving of individuals is one of the most commonly performed tasks by employees.

Auxiliary equipment should be used for handling and transporting clients and avoiding disorders, as many workers move heavy weights and have no concept of the maximum load that they should move or lift without help.

It is of paramount importance that more rest breaks should be introduced during shifts, as workers experience an enormous feeling of both physical and psychological tiredness when these end, after which they are required to repeat tasks during their next shift. The level of physical effort, (muscle effort, posture, repetition, etc.) in which workers engage is largely determined by the degree of dependence of their clients, which, as it is high, may cause problems in the upper limbs and cervical area.

The quality of life of workers is affected by their underlying performance, which is in turn related to their daily activities.

Specific training programs on caring for the elderly should be organized. These would contribute to reducing exposure to occupational risk factors and changing the ways that work is performed, in order to allow workers in the sector to improve their understanding of the problem, and prevent future disorders.

References

[1] Uva, A., Camide, F., Serranheira, F., Miranda, L. e Lopes, M. Guia de orientação para a prevenção das lesões musculoesqueléticas e

- relacionadas com o trabalho: Programa nacional contra as doenças reumáticas. Lisboa: Direção-Geral da Saúde, 2008.
- [2] Bevan, S., Reducing temporary work absence through early intervention: The case of MSDs in the EU. London: The Work Foundation – fit for work – Europe, 2013.
- [3] Punnett, L. and Wegman, D., Work-related musculoskeletal disorders: The epidemiologic evidence and debate. *Journal of Electromyography and Kinesiology*, 14, pp. 13-23, 2004. DOI: 10.1016/j.jelekin.2003.09.015
- [4] Faucett, J., Kang, T. and Newcomer, R., Personal service assistance: Musculoskeletal disorders and injuries in consumer-directed home care. *American Journal of Industrial Medicine*, 56, pp. 454-468, 2013. DOI: 10.1002/ajim.22133
- [5] Kim, S. and Lee, J., Development of an intervention to prevent work-related musculoskeletal disorders among hospital nurses based on the participatory approach. *Applied Ergonomics*, 41, pp. 454-460, 2010. DOI: 10.1016/j.apergo.2009.09.007
- [6] AESST. Introdução às lesões músculo-esqueléticas. Agência Europeia para a Segurança e saúde no Trabalho. Factsheet 71, 2007.
- [7] Johanning, E., Evaluation and management of occupational low back disorders. *American Journal of Industrial Medicine*, 37(1), pp. 94-111, 2000. DOI: 10.1002/(SICI)1097-0274(200001)37:1<94::AID-AJIM8>3.0.CO;2-X
- [8] Chagas, D., Direct action helpers at home care services: Consequences to the health of workers. In: Arezes et al., Eds. *Occupational Safety and Hygiene III*. London: Taylor & Francis Group, 2015, pp. 17-21. DOI: 10.1201/b18042-6
- [9] HSE – Health and Safety Executive. Upper limb disorders in the workplace. Sudbury: HSE Books, 2002.
- [10] Leino, P., Symptoms of stress predict musculoskeletal disorders. *Journal of Epidemiology and Community Health*, 43, pp. 293-300, 1989. DOI: 10.1136/jech.43.3.293
- [11] Schneider, E. and Irastorza, X., OSH in figures: Work-related musculoskeletal disorders in the EU-facts and figures. Luxembourg: Office for Official Publications of the European Communities, 2010.
- [12] Fonseca, R. e Serranheira, F., Sintomatologia musculoesquelética auto-referida por enfermeiros em meio hospitalar. *Revista Portuguesa de Saúde Pública*, 6, pp. 37-44, 2006.
- [13] Uva, A. e Serranheira, F., Lesões músculo-esqueléticas e trabalho - Alguns métodos de avaliação do risco. [Online], Lisboa, Sociedade Portuguesa de Medicina do Trabalho. Cadernos/Avulso 05. [date of reference January 25th of 2008], Available at: <http://www.spmtrabalho.com/downloads/ca05.pdf>.
- [14] García, M., Lite, A., Camacho, A. y Domingo, R., Análisis de métodos de valoración postural en las herramientas de simulación virtual para la ingeniería de fabricación. *DYNA*, 181, pp. 5-15, 2013.
- [15] Freitas, L., *Manual de Segurança e Saúde do Trabalho*. 1^a ed. Lisboa: Edições Sílabo, 2008.
- [16] Carneiro, P. e Arezes, P., Lesões Músculo-esqueléticas relacionadas com o trabalho (LMERT) no contexto dos riscos psicossociais. In: Neto, Areosa, Arezes (Eds). *Manual sobre Riscos Psicossociais no Trabalho*. Porto: Civeri publishing, pp. 152-171, 2014.
- [17] Formoso, J., Couce, L., Rodríguez, G. and Guerreiro, M., Functions, responsibility, and authority of human resources in the implementation of a security and safety management system at work. *DYNA*, 172, pp. 180-186, 2012.
- [18] Bakker, A., Demerouti, E. and Sanz-Vergel, A., Burnout and work engagement: The JD-R Approach. *Annual Review of Organisational Psychology and Organizational Behaviour*, 1, pp. 389-411, 2014. DOI: 10.1146/annurev-orgpsych-031413-091235

D. Chagas, holds a PhD in Hygiene, Health and Safety at Work from the University of León, Spain. She is an invited professor at the Higher Institute of Education and Sciences, in Portugal. She has authored a book and (co)authored several articles published in magazines and book chapters revised by peers in the area of health and safety at work and work conditions. Her investigation interests are focused on health and safety at work in different contexts and work conditions.
ORCID: 0000-0003-3135-7689