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Musculoskeletal disorders and actions to reduce the occurrence in nursing workers

Distúrbios osteomusculares e ações para reduzir a ocorrência em trabalhadores de enfermagem

Trastornos musculoesqueléticos y acciones para reducir la ocurrencia en trabajadores de enfermería

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ABSTRACT
Objective: to identify the presence of work-related musculoskeletal disorders in nursing staff at an internal medicine unit and, jointly with the staff, to build proposals to reduce the occurrence of musculoskeletal disorders in the workplace. **Method:** in this cross-sectional study, 31 nursing staff of a medical clinic answered a socio-demographic and professional data sheet and the Nordic Musculoskeletal Questionnaire. **Results:** staff performed their work activities with musculoskeletal pain, the most prevalent body regions being: lower back and upper spine and shoulders. Nonetheless, not everyone would take time off work or seek therapeutic care. The actions suggested to reduce musculoskeletal disorders were categorized into three dimensions: individual, team and institutional. **Conclusion:** staff had musculoskeletal disorders, mainly in the back. Actions proposed to reduce pain ranged from individual behavior to structural changes and provision of work equipment.
Descriptors: Cumulative Trauma Disorders; Disease Prevention; Nursing; Occupational Health.

RESUMO
Objetivo: identificar a presença de distúrbios osteomusculares relacionados ao trabalho nos trabalhadores de enfermagem de uma unidade de clínica médica e construir juntos aos trabalhadores propostas para reduzir a ocorrência dos distúrbios osteomusculares no ambiente de trabalho. **Método:** estudo transversal com 31 trabalhadores de enfermagem de uma clínica médica, que responderam uma ficha de dados sóciodemográfico e profissional e do Questionário Nórdico de Sintomas Osteomusculares. **Resultados:** os trabalhadores exercem suas atividades laborais com dores osteomusculares, sendo as regiões corpóreas mais prevalentes a lombar e a porção superior da coluna e ombros. Apesar disso, nem todos se afastam do trabalho ou procuram assistência terapêutica. As ações de redução dos distúrbios osteomusculares levantadas foram categorizadas em três dimensões: indivíduo, equipe e instituição. **Conclusão:** os trabalhadores apresentam distúrbios osteomusculares, principalmente, nas costas. As ações de redução de sua ocorrência perpassam pelo comportamento individual às mudanças estruturais e provisão de equipamentos de trabalho.
Descritores: Transtornos Traumáticos Cumulativos; Prevenção de Doenças; Enfermagem; Saúde do Trabalhador.

RESUMEN
Objetivo: identificar la presencia de trastornos musculoesqueléticos relacionados con el trabajo en el personal de enfermería en una unidad de medicina interna y, conjuntamente con el personal, elaborar propuestas para reducir la aparición de trastornos musculoesqueléticos en el lugar de trabajo. **Método:** en este estudio transversal, 31 miembros del personal de enfermería de una clínica médica respondieron una hoja de datos sociodemográficos y profesionales y el Cuestionario musculoesquelético nórdico. **Resultados:** el personal realizó sus actividades laborales con dolor musculoesquelético, siendo las regiones corporales más frecuentes: la parte baja de la espalda y la parte superior de la columna y los hombros. Sin embargo, no todos tomarían tiempo libre del trabajo o buscarían atención terapéutica. Las acciones sugeridas para reducir los trastornos musculoesqueléticos se clasificaron en tres dimensiones: individual, de equipo e institucional. **Conclusión:** el personal tenía trastornos musculoesqueléticos, principalmente en la espalda. Las acciones propuestas para reducir el dolor iban desde el comportamiento individual hasta los cambios estructurales y la provisión de equipos de trabajo.
Descriptores: Trastornos de Traumas Acumulados; Prevención de Enfermedades; Enfermería; Salud Laboral.

INTRODUCTION

Nursing workers often find themselves in inadequate postures during the workday because they remain standing for a long period of time or because they perform activities that require body curvature. At times, they perform activities that demand physical effort, such as changing a patient's position or helping him or her leave the bed. These occupational characteristics lead to high prevalence of Work-related Musculoskeletal Disorders (WMSD) among these professionals[1].

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WMSD are among the injuries that most affect Brazilian workers. This is a clinical syndrome of complex multifactor origin that involves individual and work organization-related aspects. Its onset and evolution have an insidious and generally progressive character. It can be permanent or not, with physiological outcomes arising from wear-and-tear processes suffered by the musculoskeletal system without enough time for its proper recovery[2].

WMSD have chronic, spontaneous or movement pain as their main characteristic. Numbness, tingling, altered sensitivity, stinging, shocks, muscle exhaustion, among others, may also be present[2].

Musculoskeletal impairment occurs primarily during professional practice, which requires physical availability for intermittent walks and support of mechanical loads, such as handling patients, as well as long periods in the orthostatic position and constant attention.

Additionally, there are work stations and wards that are not ergonomically suited to the requirements of professional practice[3], such as inappropriate sink and workbench heights, the frequent need to bend or stand on tiptoe to reach materials and supplies, chairs and computer monitors without the possibility of adjustments, chairs without backrests, beds very close to each other, small bathrooms, long corridors, bath trolleys with damaged casters and shower commodes and stretchers without regular preventive maintenance. As a result, WMSD trigger a process of physical and mental exhaustion, with outcomes in professional practice and compromised performance during the work period. It can also reverberate in the social scope of these individuals' lives, considering that pain/discomfort can be associated with functional limitations[4].

WMSD comprise one of the main causes of absence from work, with leaves occurring for periods of less than 15 days on a recurring basis and for the same reasons, thus accumulating a large number of missed working days of up to 325 days/12 months[5].

In view of these considerations, this study seeks to provide information so that hospitals can understand that illness in the work environment impacts workers' lives and that intervention proposals, in an attempt to minimize workers' health problems, must be guided from the perspective of those who experience inadequate working conditions. With this regard, this study aimed to identify the presence of work-related musculoskeletal disorders in nursing workers at an internal- medicine unit and to build, together with workers, proposals to reduce the occurrence of musculoskeletal disorders in the workplace.

METHOD

This is an exploratory, descriptive, cross-sectional, quantitative study carried out in the internal- medicine unit at a university hospital in the state of Minas Gerais. The unit comprised 28 beds, and three of its wards, with two beds each, were used for social-contact isolation or as psychiatric wards. The remaining beds were destined for patients coming from the Emergency Room to be monitored by the internal-medicine, infectious- diseases, neurology, oncology or cardiology clinics. In order to define the work division, referred to as the daily work schedule, patients were classified by degree of complexity, according to mobility, the time required for care provision and the number and complexity of medications to be administered. Although the unit was physically small, the distance between wards was also considered for work division.

For participation in the study, having been working at the institution for at least six months was adopted as an inclusion criterion. Those who were off from work, on vacation, on sick or maternity leaves during the data collection period were excluded. Thus, of the 34 workers who composed the unit's nursing team, two nursing technicians who were on vacation and one nursing technician who was on maternity leave were excluded. All eligible workers were invited and agreed to participate in the study. The sample consisted of seven nurses, 22 nursing technicians and two nursing assistants, totaling 31 participants from a homogeneous, intentional sample composed of the total number of nursing professionals.

Data collection occurred between February and March 2019 at the nursing professionals' workplace. A brown envelope with an alphanumeric code, a socio-demographic and professional-data form containing an open question and the Nordic Musculoskeletal Questionnaire (NMQ) were given to the participants. The open question on the form said: "In order to reduce the occurrence of musculoskeletal disorders, what measures should be adopted in the work environment (by you, colleagues and/or management)?". It was agreed that the envelope would be returned to the researchers on the next shift.

NMQ was developed in Finland[6], validated[7] and adapted to the Brazilian culture[8]. It aims to assess the presence of musculoskeletal symptoms in professionals, such as pain, tingling and numbness and has been recognized internationally for assessing the presence of WMSD symptoms[9]. It contains a human figure seen from the posterior region, divided into nine regions: neck, shoulders, thorax, elbows, wrists/hands, hips/thighs, knees and ankles/feet. The

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questions are related to each anatomical area and check if the respondents had pain, tingling/numbness in the last 12 months and in the last seven days. They also seek to investigate whether these individuals have had to miss work or seek medical help in the past 12 months due to the same symptoms[8].

The data were entered into the Microsoft Office Excel® 2016 computer program spreadsheets, in the form of an electronic database, with independent double entry. After correcting errors and inconsistencies, the data were exported to the Statistical Package for the Social Sciences for Windows (SPSS®), version 19.0, establishing descriptive analyses based on means, absolute and relative frequencies. And the data extracted from the open question were analyzed, categorized and treated quantitatively.

The study complied with recommendations from Resolution no. 466/12 by the National Health Council, and its project was approved by the Research Ethics Committee under no. 2.673.822. The participants were informed about the research and signed an Informed Consent Form.

RESULTS

Thirty-one workers participated in the study, with a response rate of 91.1%. Females predominated (64.5%) with a mean age of 40 ± 9.85 years, primarily between 25 and 44 years old (71.0%). Most of the participants were nursing technicians (71.0%) working in the night shift (61.3%) with a single job (87.1%), a mean number of 36.0 ± 8.6 weekly work hours and an mean length of 16.0 ± 9.26 years of professional practice. Of these 14 (45.2%) had been nursing workers for 11 to 20 years. And according to the Body Mass Index (BMI), most of them were overweight or obese (61.3%).

Regarding NMQ, most participants reported having musculoskeletal symptoms in one or more parts of the body, with 27 (87.0%) in the last 12 months and 17 (54.8%) in the last seven days.

In the last 12 months, there was a predominance of musculoskeletal symptoms in the lower back (58.1%), upper back and shoulders (54.8%), followed by the neck, wrists/hands and knees (45.2%). And in the last seven days, the most often reported regions were: the lower back (29.0%), upper back (25.8%) and shoulders and ankles/feet (19.4%), as seen in Figure 1.

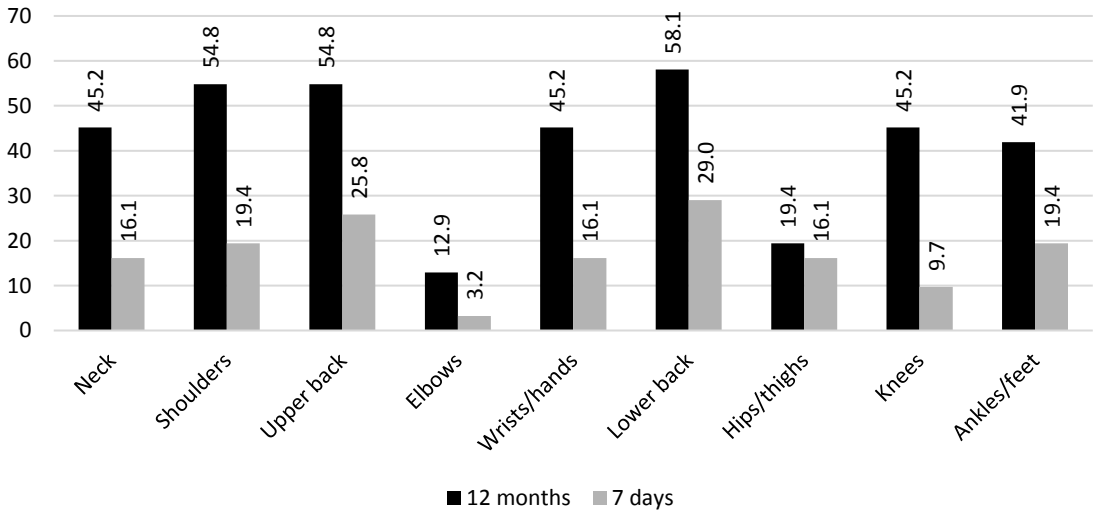

FIGURE 1: Frequency (%) of musculoskeletal symptoms reported by nursing workers in the last 12 months and in the last seven days, according to different body regions (n = 31). Belo Horizonte, Brazil, 2019.

Although musculoskeletal symptoms in the back and shoulders were the most prevalent, the symptoms that mostly resulted in the inability to perform activities were those that affected the hips/thighs (50.0%) and neck and wrists/hands (42.8%). Regarding the search for a health professional, there was a higher proportion among those showing symptoms in the wrists/hands (50.0%), as shown in Figure 2.

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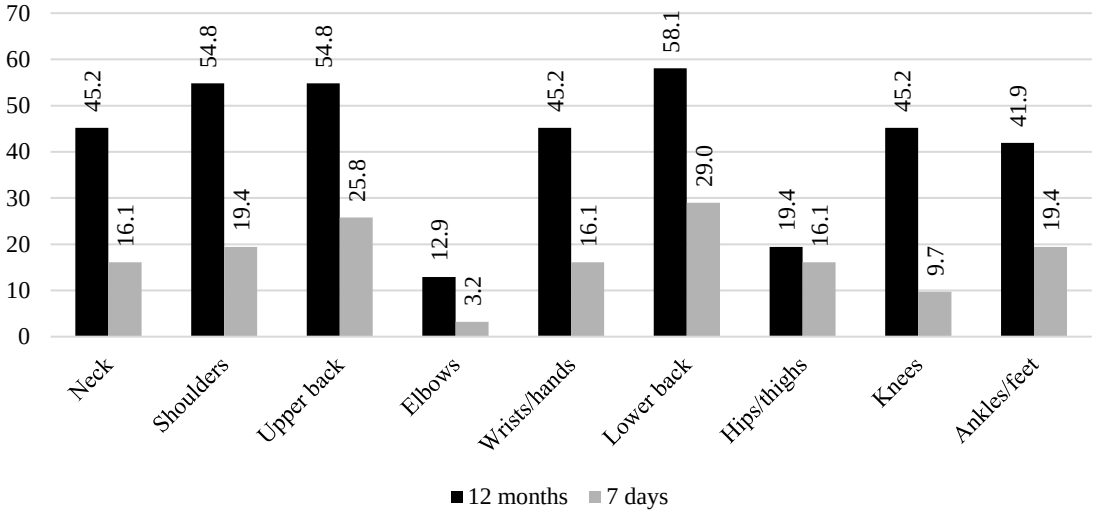

FIGURE 2: Frequency (%) of impediment to perform activities and of consultation with health professionals among nursing workers who reported musculoskeletal symptoms in the last 12 months, according to different body regions (n = 31). Belo Horizonte, Brazil, 2019.

The proposals raised among nursing workers in order to reduce WMSD occurrence were analyzed and categorized in three dimensions: individual, team and institution, as shown in Figure 3.

Individual		
– Proper use of beds; – Correct posture during patient care provision, avoiding spine curvature; – Keeping extra attention during the performance of all activities; – Carrying out functions more calmly and taking more time; – Participating in training sessions provided by the institution.		
Team		
– Keeping the environment clean and organized; – Good co-existence, clear and efficient communication between team members; – Cooperation among colleagues for tasks that require team- or pair-work efforts.		
Institution		
Furniture/Structure	**Human Resources**	**Training**
– Adequate equipment conditions; – Adequate and sufficient furniture; – Adequate physical space for performing activities; – Adequate lighting; – Periodic maintenance of equipment with wheels; – Acquisition of equipment to reduce physical effort in moving patients.	– Maintaining an adequate number of staff for the sector's demand; – Reducing the number of patients attended to by each professional.	– Training on ergonomics during bed bathing and decubitus changing as well as on how to take on weight, etc. – Lectures and courses on worker safety and well-being; – Permanent education.

FIGURE 3: Actions to prevent musculoskeletal symptoms, according to nursing workers at the internal-medicine unit. Belo Horizonte, Brazil, 2019.

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DISCUSSION

When investigating the presence of WMSD in nursing workers at an internal-medicine unit, a sample comprising mostly young females (64.5%) with a mean age of 40 ± 9.85 years was identified. WMSD occurrence has been most frequently reported in female workers, as pointed out in some studies[10-11]; however, the mechanism involved is still unclear.

The mean length of professional practice was 16.0 ± 9.26 years, which was very similar to that of 13 years reported by a Portuguese study12. Nursing tasks and the frequency in which they are performed are among the determinant factors for WMSD onset, even in a younger population.

Nursing technicians are the most susceptible workers to musculoskeletal pain, with 2.794 more chances than other health professionals. They report more pain, fatigue and tension whereas nurses report more muscle tension[13].

The night shift has a positive correlation with weight gain among nursing workers due to hormonal and social changes[14], as shown in a study with 671 nurses correlating the occurrence of acute low-back pain to the night shift, prolonged shifts and obesity[15]. Furthermore, these factors contribute to BMI increase, with an impact on the prevalence of low-back pain[16].

WMSD have high occurrence among nursing professionals. It was shown that 27 (87.0%) nursing workers had musculoskeletal symptoms in the last 12 months and 17 (54.8%) in the last seven days. Similar results were found in other studies that examined musculoskeletal symptoms in the last 12 months (88.0%[16], 82.1%[17] and 74.7%[18]) and in the last seven days (58.0%[16]).

There was a predominance of musculoskeletal symptoms in the back both in the last 12 months and in the last seven days, particularly in the lower back, the lumbar region. In a cohort of 4,977 health professionals, it was identified that physical effort, perceived as strenuous during health care work, increased the risk for chronic low-back (OR 3.16, 95% CI 1.79-5.57) and knee pain (OR 1.87, 95% CI 1.19-2.94)[19]. In addition, the lumbar region[19-20] has been the most often reported body part among workers with musculoskeletal discomfort, followed by the neck, thorax[20] and knees[21].

Low-back pain results from increased pressure on the spine. It is related to the nature of nursing work and inadequate patient lifting techniques[22], the lifting of excessive loads, constant spine flexion and inadequate postures during procedures[11].

Some studies have shown that, in addition to the impacts on the professional and social life of nursing workers, WMSD, and particularly chronic low-back pain[23], are related to presenteeism[24], a condition in which workers come to work sick, thus causing productivity reduction with consequent risks to their integrity and patient safety[25]. Absenteeism (absence and/or delays at work) is also reported in the literature as one of the consequences of WMSD occurrence in professionals[16].

Therefore, nursing workers have remained in the work environment, providing care, albeit in pain. And pain, particularly in the lumbar region, has not been an impediment to carrying out activities or a reason to seek care from a professional, at least among the participants in this study. On the other hand, this situation can compromise professional practice, as found in a study in which 81.8% of nursing workers recognized that working even when in pain is a major problem for the work process[26].

Different reasons, such as WMSD invisibility, fear of unemployment, stigmas, absence of social support at work[27] or even the naturalization of pain, self-medication, self-demands, commitment to the team so as to not undermine it, can lead nursing workers to remain in the field of work, which contributes to the worsening and chronicity of their clinical condition with important outcomes, such as the worsening of pain, limitation of movements to physical disability and the need to go on a permanent leave of absence from work. Thus, in an attempt to minimize workers' health problems and reduce WMSD occurrence, a set of actions in the work environment for the individual worker, the team and the institution was proposed, highlighting the co-responsibility of workers and the institution.

In the individual dimension, actions were proposed that involve the adequate use of furniture, adequate posture, attention and training participation. The beds in the internal-medicine unit were all electric; however, not all professionals used their resources. Thus, adequate bed use is proposed by adjusting it to the most comfortable height for workers providing care to bedridden patients and avoiding spine curvature. To that end, professionals should more carefully plan the time necessary to perform their activities more attentively and calmly. They should also be committed to participating in the training provided by the institution.

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In the team dimension, actions move towards a good relationship among workers, based on the care for the common environment by keeping it clean and organized, on good team communication and on cooperation in activities that require physical effort. Unhealthy relations among members of the nursing team can generate conflicts and difficult interpersonal relations, thus contributing to workers' illness. Hence, actions that minimize the process of workers' wear and tear must be supported[28].

As for the actions related to the institution's dimension, these were organized on three fronts: furniture/structure, human resources and training.

While in the individual dimension workers must make adequate use of furniture resources, it is the institution's responsibility to provide adequate and sufficient furniture and equipment, to perform preventive equipment maintenance and to provide adequate lighting and physical space for safe work. In addition, due to the number of dependent patients, the acquisition of equipment to reduce physical effort in patient movement is proposed.

Furthermore, it is also the institution's responsibility to provide the necessary resources to carry out work activities in an appropriate and comfortable fashion, such as adequate furniture that is consistent with professionals' anthropometric measures so as not to cause postural or movement problems[29].

However, only having transfer devices does not promote worker safety, as it is necessary to create a climate of awareness in the team of professionals about safe practices during patient transfer. It is also necessary to reduce obstacles to the use of these devices, such as facilitating access to them, providing adequate locations for their storage and sufficient space for their use[30]. Since, otherwise, there will be barriers that will influence the decision whether to use transfer devices or not.

Other barriers may also be present in the work environment, such as the difficulty of physically accessing equipment and the lack of knowledge and ability to use it. Thus, it is necessary to involve the team in favor of using such devices and the engagement of institutions to improve access and professionals' training[31].

Furthermore, ergonomic techniques can be applied to reduce the physical effort required in handling patients, in addition to evaluating the workload, posture and work ergonomics[32].

Likewise, service management must be responsible for the organization and planning of an appropriate physical structure, seeking to prevent workers from covering long distances in institutions.[28]

In addition, it suggests adjusting the number of nursing workers according to the sector's demand and reducing the number of patients per professional, with a view to a sufficient number of workers for carrying out activities, without the need for excessive physical effort[28].

However, in order to meet service demands, nursing workers submit to physical effort, intense pace and repetition, sometimes overcoming their physical and mental limits and remaining in the work environment, even in the presence of musculoskeletal pain[27].

And, finally, the research participants point out the importance of continuing education with a view to training on worker safety and well-being, in addition to training on ergonomic principles in assisting patients during bed bathing, decubitus changing and in lifting weight.

Despite the magnitude of the problem related to musculoskeletal symptoms in nursing workers, which are evident in this study and in the national and international literature, there are timid programs for ergonomic intervention, professional training courses on patient transfer and mechanical devices for patient transfer[11].

In a randomized case-control study, 67 nurses from the case group participated in educational didactic activities, spine-strengthening exercises and training on safe techniques for lifting patients for three months. The mean pre-intervention low-back pain intensity score on the visual analogue scale decreased from 49.3 to the post-intervention score of 7.5 (from 0 to 100). The correct execution of vertical lifting techniques in the experimental group increased from 8.9% to 97.0%. The pre-intervention patient horizontal lifting technique increased from 10.4% to 100.0% of correct execution in the experimental group[22].

CONCLUSION

WMSD are prevalent among study participants, with 87.0% reporting having one or more symptoms in some part of the body in the last 12 months, and 54.8% in the last seven days. Regarding body parts, in the last 12 months, musculoskeletal symptoms predominated in the lower back (58.1%), upper back and shoulders (54.8%), followed by the

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neck, wrists/hands and knees (45.2%). In the last seven days, the most often reported regions were: the lower back (29.0%), the upper back (25.8%) and shoulders and ankles/feet (19.4%).

As for the proposals to reduce musculoskeletal disorders in the work environment suggested by workers, these were distributed in three dimensions: individual, team and institution, and they go through individual behavior to structural changes and provision of work equipment for workload reduction.

Therefore, with a view to reducing WMSD, nursing workers should co-participate in the development of institutional measures to reduce such conditions, and thus increase the chances of success of intervention strategies to improve working conditions.

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