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Identificación de lesiones musculoesqueléticas en personal de salud y seguridad industrial

Identification of musculoskeletal injuries in health and industrial safety personnel

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Palabras claves:
higiene postural, lesiones musculoesqueléticas, personal de salud, prevención, seguridad industrial.

Resumen

Introducción: el estudio de las lesiones musculoesqueléticas en personal de salud y la seguridad industrial es crucial porque permite determinar e impacto de estas, consecuencias y medidas preventivas a aplicar. **Objeto:** identificar las lesiones musculoesqueléticas en personal de salud y seguridad industrial. **Metodología:** enfoque cuantitativo, de diseño transversal, cuya muestra se integró de 46 participantes, a quienes se les aplicó la encuesta (técnica de recolección de datos) mediante un cuestionario (instrumento de recolección de datos) comprendido por 11 ítems, cuyo análisis se ha realizado con apoyo de Microsoft Excel. **Resultados:** 61% de los encuestados son del género femenino, al tiempo que el 39% han sido del género masculino; la mayoría de los encuestados (52%) experimenta dolor o molestia 1-2 veces por semana, con una duración mayor a 3 horas (37%), y el dolor se presenta generalmente en la mañana (46%) y es categorizado como moderado por el 41% de los encuestados. En lo relacionado con el impacto del dolor en la capacidad laboral del personal de salud, se evidencia que el 43% afirman que les afecta ocasionalmente, mientras que el 24% menciona que frecuentemente o raramente les afecta y un 9% dice que nunca impacta su capacidad laboral, la región anatómica más afectada por el dolor o molestia es el área cervical (30%), seguida por la cervicolumbar (22%), mientras que el tipo de lesión más común es la distensión muscular y la contractura, ambas con un 30%. **Conclusión:** los encuestados experimentan dolor o molestia 1-2 veces por semana, con una duración mayor a 3 horas y que generalmente se presenta en la mañana y que la región anatómica más afectada es el área cervical, seguida por la cervicolumbar. **Área general de estudio:** salud y bienestar. **Área específica de estudio:** medicina laboral y salud ocupacional. **Tipo de estudio:** original.

Keywords:
postural hygiene, musculoskeletal injuries, health

Abstract

Background: The study of musculoskeletal injuries in health personnel and industrial safety is crucial because it allows determining their impact, consequences and preventive measures to be applied. Objective: identify musculoskeletal

personnel, prevention, industrial safety.

injuries in industrial health and safety personnel. Methodology: quantitative approach, cross-sectional design, whose sample was made up of 46 participants, to whom the survey was applied (data collection technique) using a questionnaire (data collection instrument) comprised of 11 items, the analysis of which was carried out with the support of Microsoft Excel. Results: 61% of respondents were female, while 39% were male; most respondents (52%) experience pain or discomfort 1-2 times a week, lasting more than 3 hours (37%), and the pain usually occurs in the morning (46%) and is categorized as moderate by 41% of respondents. Regarding the impact of pain on the work capacity of health personnel, it is evident that 43% claim that it affects them occasionally, while 24% mention that it frequently or rarely affects them and 9% say that it never impacts their work capacity; the anatomical region most affected by pain or discomfort is the cervical area (30%), followed by the cervicolumbar (22%), while the most common type of injury is muscle strain and contracture, both with 30%. Conclusion: Respondents experience pain or discomfort 1-2 times per week, lasting more than 3 hours and generally occurring in the morning. The most affected anatomical region is the cervical area, followed by the cervicolumbar area. General area of study: health & wellness. Specific study area: occupational medicine and occupational health. Type of study: original.

Introduction

Skeletal muscle, also known as striated muscle, is one of the most abundant tissues in the human body (1), which is responsible for voluntary movement. However, "musculoskeletal injuries in health professionals comprise a problem that has been little studied but has a great impact on the professional, on the patient who receives their care and on the employing organization" (2).

Based on the ideas raised, it should be noted that carrying out studies related to the identification of musculoskeletal injuries in health personnel and industrial safety is crucial because in this way it is possible to determine the prevalence of these injuries, the

magnitude of their consequences and the preventive measures that are being applied, understanding that industrial safety "studies accidents and occupational risks with a preventive and research approach" (3) and this is precisely the orientation of this study, going beyond the identification of prevalence and identifying the preventive actions that have been applied and that can be implemented.

In accordance with the above, it is understood that the deployment of investigative work related to the identification of musculoskeletal injuries in health personnel and industrial safety is important because this type of injuries can trigger "decreased productivity, decreased quality of work, increased costs" (4), affecting the health and well-being of the health professionals who are compromised (5).

On the other hand, it should be noted that the interest in studying this issue is due to the potential impact it may have on the quality of life of health personnel (6), the operational efficiency of health institutions (7), and the care provided to patients (8), in addition to the fact that the identification of musculoskeletal injuries in health and industrial safety personnel could help promote a safer work environment for health professionals (9), so the objective of this study has focused on the identification of musculoskeletal injuries in health and industrial safety personnel.

At this point it is considered pertinent to address the current knowledge regarding the subject addressed, so a bibliographical exploration has been carried out with the following findings:

Table 1. Current knowledge on the topic addressed

Author(s) - Year	Country	Methodology	Main findings
Kugler et al. (2024) (10)	Australia	Meta-analysis	Training may be an ineffective strategy to reduce musculoskeletal injuries and pain.
Duriˇc et al. (2024) (11)	Czech Republic	Experimental Quantitative 16 participants	There is a core set of ergonomic recommendations and principles that has been provided by multiple authors and the ASGE (American Society for Gastrointestinal Endoscopy). All recommendations follow a similar structure, including guidance on preparing the endoscopy room for performing endoscopic procedures. The common feature of all of these recommendations is the focus on how to minimize the risk of injury during endoscopic procedures. Studies have shown that despite strict adherence to these guidelines, injuries still occur.

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Table 1. Current knowledge on the topic addressed (continued)

Author(s) - Year	Country	Methodology	Main findings
Ait et al. (2024) (12)	Morocco	Cross-sectional study 120 participants Questionnaire	The overall prevalence of Musculoskeletal Disorder (MSD) was found to be 89.2%. Low back pain was the most common reported site of pain, accounting for 63.3% of cases in the past 12 months. Females had a higher prevalence of MSD (95.0%) compared to males (77.5%) (p-value = 0.009). Midwives had the highest prevalence (93.8%), followed by physiotherapists (87.5%) and general nurses (84%). Professionals working in shift work system had a higher prevalence of MSD (92%).
Conti et al. (2024) (13)	Italy	Systematic review	Recent findings show that the prevalence of musculoskeletal disorders is high among healthcare workers. The most studied sector of the population are nurses, surgeons, dental professionals and physiotherapists. The prevalence of musculoskeletal disorders in these professionals is high, especially in the lumbar, neck and shoulder areas. Physical and technological interventions are effective in reducing the prevalence of musculoskeletal pain in the aforementioned body areas. Research on musculoskeletal disorders in healthcare workers is increasing, and although most of it is descriptive and assesses the point prevalence of this problem, it continues to represent a significant public health problem, problems that should be reduced through feasible and cost-effective technological and physical interventions. Future longitudinal and qualitative studies could be valuable in improving knowledge about this complex phenomenon.
Ordoñez et al. (2024) (14)	Ecuador	From the field 21 participants Nordic Kuorinka Questionnaire	Musculoskeletal discomfort was identified, the most frequent being in the neck and shoulders. 71.42% reported neck discomfort, and 52.38% in the shoulder. The need for prevention strategies and awareness about healthy working conditions is highlighted.

Table 1. Current knowledge on the topic addressed (continued)

Author(s) - Year	Country	Methodology	Main findings
Richarz et al. (2023) (15)	Canada	Systematic review	We identified as outcomes the prevalence of low back pain in one study, disability from low back pain in one study, perceived/self-rated low back pain in one study. three studies, musculoskeletal injuries (MSI) as a rate in seven studies, MSI in absolute numbers of cases in 12 studies and maximum, cumulative spinal compression and shear loading in eight studies. Due to the heterogeneity of the results and the small number of studies on which a meta-analysis could be performed, perceived low back pain (two studies), maximum compressive spinal load (three studies) and MSI rate (three studies) were included only. However, results that could not be analysed quantitatively were also reported narratively. All studies reported absolute numbers of MSI as well as some studies reporting MSI rates could not be considered because they did not provide the number of workers at risk. Future studies should be of controlled observational and quasi-experimental type. to guide future evaluation of capital investments by health care facilities in appropriate mechanical devices for patient management.
Pozo & Vallejo (2023) (16)	Ecuador	From the field Nordic Questionnaire	The study has proposed a comprehensive approach to mitigate these risks through ergonomic practices and training programs.
Asuquo et al. (2021) (17)	Ireland	Systematic review	The ceiling lift is the intervention of choice to reduce work-related musculoskeletal disorders as it reduces the stress associated with pushing and pulling. Risk assessment is vital to determine individual needs for safe handling. Further research is required to determine the efficacy of Behavioural Therapy for injury reduction.

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Table 1. Current knowledge on the topic addressed (continued)

Author(s) - Year	Country	Methodology	Main findings
Trelles & Mamani (2021) (18)	Peru	Quantitative Descriptive Correlational Cross 27 participants Questionnaire	77% have a moderately adequate level of practice, 19% have an adequate level of practice, while 4% have an inadequate level. "When the level of knowledge is low, this is associated with an inadequate level of practice (4%); when the level of knowledge is raised to medium, the level of practice is raised to moderately adequate (38%) and adequate (12%); and when the level is high, the level of practice is also moderately adequate (38%) and adequate (8%)" (p. 161)
Lietz et al. (2020) (19)	Germany	Systematic review	In five studies (46%), magnifying loupes or prismatic glasses were the topic of ergonomic interventions. Other topics were the ergonomic dental chair (n = 2, 18%) and Dental instruments (n=1, 9%). Three studies (27%) evaluated ergonomic training that aimed to reduce Musculoskeletal Disorders (MSDs) among dental professionals and mainly investigated the effect of an ergonomic dental chair on dental professionals' working posture. Eight studies (73%) focused on environmental prevention and three studies (27%) on behavioural prevention as strategies to deliver ergonomic interventions to reduce MSDs or improve working posture among dental professionals.
Tavakkol et al. (2020) (20)	Iran	Systematic review	Operating room personnel are the most affected by musculoskeletal pain (58-90%) due to difficult working conditions. Musculoskeletal disorders can occur in different parts of the body. The most common areas of involvement include the neck, shoulders, elbows, wrists and hands, upper and lower back, hips and thighs, knees, ankles and feet. Among musculoskeletal disorders, low back pain has the highest prevalence.

Table 1. Current knowledge on the topic addressed (continued)

Author(s) - Year	Country	Methodology	Main findings
Tavakkol et al. (2020) (20)	Iran	Systematic review	This disorder is defined as pain or discomfort in the space between the twelfth rib and the inferior gluteal folds and ranks eighth among all physical injuries and is the second most commonly diagnosed in the United States. In previous studies, the prevalence of upper and lower back pain was assessed separately, with reported rates of 46–84%31,34 and 32.7–54.6%25,33 for the lower and upper back groups respectively. In addition to back pain, Although pain and discomfort were more prevalent in operating room staff, discomfort was significant in other areas. Various studies have reported pain and discomfort in the ankles and feet, knees and hips in 55.8–74%, 22–60.5% and 23.8–52% respectively. The prevalence of these disorders in the upper limbs was also affected by the shoulder, elbow and wrist and hand areas 33–74.3%, 19–52% and 55.8–74% respectively. The high prevalence of these disorders in the upper limbs is related to the physical condition of the operating room staff.
Monaco et al. (2020) (21)	Italy	Systematic review	Five studies primarily investigated the association between the use of anti-X aprons and musculoskeletal disorders (MSDs), showing that a higher prevalence of disorders was not always associated with the use of protective aprons. No study investigated the impact of anti-X aprons on fitness for work. assessment, particularly in subjects with MSDs. There is no complete agreement on the correlation between the use of anti-X aprons and the occurrence of MSDs, although the potential discomfort of workers wearing anti-X aprons seems more evident. Further studies are needed to objectify the role of these protective devices in the genesis of MSDs and to offer specific ergonomic solutions for healthcare workers.

Note:own elaboration based on the cited works.

Thus, it can be stated that most of the studies consulted have focused their attention on determining the prevalence of musculoskeletal injuries, among which are Conti et al. (13) and Ordoñez et al. (14), who have frequently managed to identify the neck and shoulders as the most affected areas. For their part, Ait et al. (12) reported a general prevalence of musculoskeletal disorders of 89.2%, in which low back pain is the most common.

Kugler et al. (10) and Richarz et al. (15) have pointed out that, although efforts have been made in training and risk assessment, these approaches have not always been effective in preventing injuries. In contrast, few studies, such as those by Pozo & Vallejo (16) and Trelles & Mamani (18), have addressed prevention through ergonomic practices and industrial safety programs, highlighting the need for more effective preventive strategies and education on preventive practices among health professionals.

Methodology

The design of this study has been quantitative since an instrument was applied that has generated numerical data. Field study since the health personnel of a health institution have been approached with the purpose of determining the actions for prevention of musculoskeletal injuries that are known and implemented by health personnel considering industrial safety.

As for the approach, it is quantitative, due to the nature of the data reported and the design has been transversal since the data collection instrument designed has been applied at a single moment of the research.

The population consisted of health personnel from a public hospital. The following criteria were applied to determine the sample: health personnel from a public hospital; health personnel of both sexes; health personnel of all ages; health personnel who attend the data collection instrument on the day of application; health personnel who voluntarily agree to participate in the study; health personnel who have worked in the hospital for at least the last 12 months; health personnel who work at least 20 hours a week.

Thus, the sample was made up of 46 participants, to whom the survey was applied (data collection technique) using a questionnaire (data collection instrument) comprised of 11 items, the analysis of which was carried out with the support of Microsoft Excel.

Results and discussion

In Table 2. it can be observed that 61% of the respondents were female, while 39% were male, indicating that there was greater participation of women in the survey.

Table 2. Distribution of respondents by gender

Gender	Frequency	Percentage
Female	28	61%
Male	18	39%
Total	46	100%

Note: Survey of health personnel

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Likewise, Table 3 confirmed that the majority of respondents (52%) experience pain or discomfort 1-2 times per week, lasting more than 3 hours (37%), and the pain usually occurs in the morning (46%) and is categorized as moderate by 41% of respondents. Regarding the impact of pain on the work capacity of health personnel, it is evident that 43% claim that it affects them occasionally, while 24% mention that it frequently or rarely affects them and 9% say that it never impacts their work capacity.

Table 3. Questions first section

No.	Items	Response alternatives							
		F	%	F	%	F	%	F	%
1	Frequency of pain or discomfort weekly	Never		1-2 times		3-4 times		5 or more times	
		6	13%	24	52%	10	22%	6	13%
2	Duration of pain or discomfort	Less than 1 hour		1-3 hours		More than 3 hours		All day	
		11	24%	11	24%	17	37%	7	15%
3	Time of day when you experience the most pain or discomfort	Tomorrow		Late		Evening		It varies	
		21	46%	9	20%	6	13%	10	22%
4	Severity of pain or discomfort	Mild		Moderate		Severe		Disabling	
		14	30%	19	41%	10	22%	3	7%
5	Impact of pain on work capacity	Sometimes		Frequently		Rarely		Never	
		20	43%	11	24%	11	24%	4	9%

Note: survey of health personnel.

Meanwhile, in Table 4, it has been documented that the anatomical region most affected by pain or discomfort is the cervical area (30%), followed by the cervicolumbar (22%), while the most common type of injury is muscle strain and contracture, both with 30%. Regarding the use of medical treatment or physiotherapy, 36% of respondents claim to have never used it, while 35% claim to have used it once.

Regarding the use of ergonomic support, it is occasional for 57% of respondents, while 17% say they have never used it. A considerable number of respondents (43%) use pain medication sometimes, and 35% do so frequently.

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Table 4. Questions second section

No.	Items	Response alternatives											
		F	%	F	%	F	%	F	%	F	%	F	%
6	Anatomical region of pain or discomfort	Cervical		Cervical lumbar		Full column		Cervicodorsal		Dorsal		Lumbar	
		14	30%	10	22%	8	17%	5	11%	5	11%	4	9%
7	Type of injury experienced	Muscle strain		Contracture		Herniated disc		Sprain		Has not experienced any injuries			
		14	30%	14	30%	7	15%	5	11%	6	13%		
8	Use of medical treatment or physical therapy	Never		Once		Several times		Regularly		Frequently			
		12	36%	16	35%	5	11%	7	15%	6	13%		
9	Using ergonomic support	Never		Sometimes		Often		Always					
		8	17%	26	57%	3	7%	9	20%				
10	Use of medication for pain or discomfort	Never		Rarely		Sometimes		Frequently					
		4	9%	6	13%	20	43%	16	35%				

Note: survey of health personnel.

The results of this study denote that 61% of the respondents are women and 39% are men, which is consistent with the research of Ait et al. (12), who also found a higher prevalence of musculoskeletal disorders (MSDs) in women (95%) compared to men (77.5%). However, the frequency of weekly pain or discomfort occurs mostly 1-2 times per week (52%), which is a similar finding to that reported by Kugler et al. (10), who state that, despite ergonomic training, pain remains frequent.

Regarding the duration of pain, this study shows that 37% of respondents experience pain for more than 3 hours, which is consistent with the results reported by Ordoñez et al. (14), in which prolonged musculoskeletal discomfort in the neck and shoulders was identified. Regarding the severity of pain, this study is predominantly moderate (41%), which is to some extent consistent with that reported by Conti et al. (13), where the prevalence of musculoskeletal disorders is high, especially in the lumbar area, neck and shoulders.

Regarding the anatomical region of the pain, it is concentrated in the cervical region (30%), followed by the cervicolumbar region (22%), which is associated with the results of Richarz et al. (15), authors who managed to identify a high prevalence of lumbar and cervical pain among the health workers they addressed in their research.

Conclusion

- It has been shown that the majority of respondents experience pain or discomfort 1-2 times per week, lasting more than 3 hours and generally occurring in the morning and that the most affected anatomical region is the cervical area, followed by the cervicolumbar area.
- Pain has been documented to occasionally affect the working capacity of healthcare personnel, however, despite the impact of pain, a significant portion of respondents have never used medical treatment or physiotherapy, and the use of ergonomic support is only occasional for the majority.
- A significant number of respondents have been documented to use pain medication, although frequency varies and medication use may reflect a lack of preventative intervention and reliance on temporary solutions.
- Based on the conclusions issued, the following recommendations are presented:
- It is considered necessary to implement prevention and industrial safety strategies to reduce the frequency and severity of these ailments in health personnel, so it is suggested to carry out a study in which a preventive guide is designed.
- Awareness and accessibility to effective ergonomic and industrial safety treatments and measures must be increased.
- It is pertinent to design and implement comprehensive industrial safety programs that include preventive, educational and therapeutic measures to manage pain more effectively and sustainably.

Conflict of interest

The authors declare that they have no conflicts of interest that could compromise, in whole or in part, the results of this work or its publication.

Authors' contribution statement

ANMM and ECMV conceived the research idea, defined the problem and carried out an initial search for information.

ANMM and ECMV conducted the non-systematic search to construct the database of articles and designed the first draft under the supervision of JFJR.

JFJR supervised the execution of the investigation by ANMM and ECMV.

ANMM and ECMV wrote the final draft of the paper with corrections and revisions by JFJR.

ANMM, ECMV and JFJR approved the final manuscript.

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