Indonesian Journal of Global Health Research
Volume 8 Number 1, February 2026
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

FACTORS ASSOCIATED WITH MUSCULOSKELETAL DISORDERS (MSDs) IN NURSES IN HOSPITAL INPATIENT AREAS

Rizki Yeni Wulandari*, Yunina Elasari, M. Rifqi Abdillah
Universitas Aisyah Pringsewu, Jl. A. Yani 1A Tambahrejo, Gadingrejo, Pringsewu, Lampung 35372, Indonesia
*qeewrizki14@gmail.com

ABSTRACT

Nurses are healthcare workers with a high physical workload, requiring them to perform various activities such as lifting, moving, and maintaining patient positions for extended periods. These activities can cause repetitive stress on the muscular and skeletal systems, potentially leading to musculoskeletal disorders (MSDs). The research objective was to determine the factors associated with Musculoskeletal Disorders (MSDs) in nurses in the inpatient ward of the Regional General Hospital. The quantitative research method used a cross-sectional design, with data collection using questionnaires and observation methods. This study used the Rapid Entry Body Assessment (REBA) instrument with a validity of 0.61 and a reliability of 0.625. The Nordic Body Map (NBM) questionnaire has a validity test result of 0.543-0.768 with a reliability test of 0.720. The study sample consisted of all nurses working in the inpatient ward of the Regional General Hospital in 2025, totaling 164 respondents. Total sampling was the method of sample that was employed. Bivariate data analysis used the Spearman test. The results of the analysis showed that there was a significant relationship between ergonomic position and the risk of musculoskeletal disorders, with a p value = 0.001 and a correlation coefficient (r) = 0.348 indicating a positive relationship with moderate strength. Meanwhile, age (p = 0.064), length of service (p = 0.137), length of service (p = 0.166), and workload (p = 0.598) did not show a significant relationship with the incidence of musculoskeletal disorders in nurses in the inpatient ward. This study showed a significant association between ergonomic positioning and the risk of musculoskeletal disorders in nurses in inpatient wards. However, age, length of service, length of service, and workload were not significantly associated with the development of musculoskeletal disorders.

Keywords: disorders; ergonomic position; musculoskeletal; work duration; workload; working period

How to cite (in APA style)
Wulandari, R. Y., Elasari, Y., & Abdillah, M. R. (2026). Factors Associated with Musculoskeletal Disorders (MSDs) in Nurses in Hospital Inpatient Areas. Indonesian Journal of Global Health Research, 8(1), 301–306. https://doi.org/10.37287/ijghr.v8i1.494.

INTRODUCTION

Musculoskeletal disorders (MSDs) are medical conditions that impact the muscles, bones, joints, and nerves that make up the body's movement system. They can be brought on by heavy physical activity, repetitive motions, or bad posture. (Shobur et al, 2019). Globally, the prevalence of Work-Related Musculoskeletal Disorders (WMSDs) is quite high, especially among nurses, with figures reaching 78,6% to 88% in Asia and 97,3% in Indonesia. (Khishnan et al, 2021). The most commonly affected body parts are the lower back, neck, and shoulders. (Sun et al, 2023).

Musculoskeletal conditions harm nurses' physical health, causing pain and restricted mobility, but they also lower the quality of nursing services, lower quality of life, and raise the risk of depression. (Gideon et al, 2021). Workplace noncompliance with ergonomic principles is one of the primary causes of these diseases. To reduce accidents and increase efficiency, ergonomics seeks to match tasks, tools, and workspaces to human capabilities. (Mansoor et al, 2022). Nonetheless, a lot of nurses continue to perform non-ergonomic tasks including lifting patients, bending, or working in stationary positions, including creating nursing paperwork. Because these tasks can raise the risk of musculoskeletal problems, nurses are required to be able to manage their time well (Wulandari et al, 2022).

Previous research has shown a significant correlation between ergonomics and musculoskeletal disorders, namely, finding a strong correlation between ergonomic risk factors and musculoskeletal complaints. (Rahayu et al, 2024). Workloads that are too heavy can also cause occupational diseases, one of which is MSDs (Mahawati et al, 2023). The study result showed that there was a correlation between workload and complaints of low back pain in nurses at the Arifin Achmad Regional Hospital of Riau. (Fitriani et al, 2025). Other research states that age and work period are related to musculoskeletal disorders, namely that the older a person is and the longer the work period, the more MSD complaints increase. (Dewi et al, 2024). In addition, workers with a working duration of more than 8 hours a day also have a higher risk of experiencing musculoskeletal complaints. (Rahmawati, 2020).

According to a preliminary survey of nurses at X Regional General Hospital (RSUD X), many of them reported having shoulder, neck, and back pain as a result of using non-ergonomic working positions when lifting patients or working in front of a computer. Nurses' MSDs can lead to issues for patients, hospitals, and nurses themselves. It can lower quality of life, raise the risk of depression, and increase turnover among nurses. The medical expenses of nurses with musculoskeletal illnesses must be paid for by hospitals, which may lower the standard of nursing care provided to patients. This study aims to analyze the factors related to the emergence of musculoskeletal problems in nurses working in the inpatient ward of the Regional General Hospital.

METHOD

This research uses a quantitative research method with a cross-sectional research design, namely studying the correlation between variables. (Riyanto, 2019). In this study, researchers observed the nurses' working positions while working using the Rapid Entry Body Assessment (REBA) instrument and justified it using the Angel Master application to measure the degree of inclination of the respondents. (Afma et al, 2019), Then the researcher also distributed questionnaires to nurses in the inpatient ward to assess musculoskeletal complaints using the Nordic Body Map (NBM) instrument (20) and the workload instrument. (Wulandari, 2022). This study used the Rapid Entry Body Assessment (REBA) instrument with a validity of 0.61 and a reliability of 0.625. The Nordic Body Map (NBM) questionnaire had a validity test result of 0.543-0.768 with a reliability test of 0.720. Workload, ergonomic position, work period, and duration of employment were the study's independent variables. The musculoskeletal conditions were the dependent variable. The study's population consisted of nurses working in inpatient wards, and the sample size was limited to 164 nurses working in inpatient wards. Total sampling was the method of sample that was employed. The Spearman test was the analysis employed in this investigation.

RESULT

Table 1.
Correlation between Nurses' Work Duration and Musculoskeletal Disorders in Nurses in the Inpatient Ward of Regional General Hospital

Work duration	Musculoskeletal Disorders						Total		*p Value*
	Low Risk		Moderate Risk		High Risk				
	f	%	f	%	f	%	f	%	
≤8 Hours	30	22,7%	8	6,1%	4	3%	42	31,8%	0,166
>8 Hours	73	55,3%	15	11,4%	2	1,5%	90	68,2%	

Based on the data in Table 1 regarding the relationship between work duration and musculoskeletal disorders, it is known that the largest group is respondents with a workload of more than 8 hours who have a low risk, namely 73 people (55.3%). Furthermore, 8 respondents (6.1%) were recorded with a workload ≤ 8 hours and a low risk. The results of the analysis using the Spearman correlation test showed a p value = 0.166 (> 0.05), which indicates there is no significant relationship between workload and the risk of musculoskeletal disorders, so H_0 is accepted and H_a is rejected.

Table 2.
Correlation between Nurses' Work period and Musculoskeletal Disorders in Nurses in the Inpatient Ward of the Regional General Hospital

Work period	Musculoskeletal Disorders						Total		*p Value*
	Low Risk		Moderate Risk		High Risk				
	f	%	f	%	f	%	f	%	
≤ 5 Years	86	65,2%	18	13,6%	3	2,3%	107	81,1%	0,137
> 5 Years	17	12,9%	5	3,8%	3	2,3%	25	18,9%	

Based on the data presented in Table 2 regarding the relationship between length of service and musculoskeletal disorders, the results of the study show that the largest number of respondents were those with a length of service ≤5 years with low risk, namely 86 respondents (65.2%). Other data are those with a length of service >5 years with low risk, namely 5 respondents (3.8%). The results of the analysis using the Spearman test to see whether there is a significant relationship between length of service and the risk of musculoskeletal disorders obtained results with a p value of 0.137 > 0.05 so that it can be concluded that there is no significant relationship or Ha is rejected and Ho is accepted.

Table 3.
The Correlation between Workload and Musculoskeletal Disorders in Nurses in the Inpatient Ward of Regional General Hospital

Workload	Musculoskeletal Disorders						Total		*p Value*
	Low Risk		Moderate Risk		High Risk				
	f	%	f	%	f	%	f	%	
High Workload	88	66,7%	21	15,9%	3	2,3%	112	84,8%	
Medium Workload	12	9,1%	2	1,5%	3	2,3%	17	12,9%	0,598
Low Workload	3	2,3%	0	0%	0	0%	3	2,3%	

Based on the data in Table 3 regarding the correlation between workload and musculoskeletal disorders, it is known that the most data is on high workload and low risk of musculoskeletal disorders, namely 88 respondents (66.7%). The second most data is on high workload and medium risk, namely 21 respondents (15.9%). In third place is on medium workload and low risk, namely 12 respondents (9.1%). Other data are high workload and high risk as many as 3 respondents (2.3%), medium workload and medium risk 2 respondents (1.5%) and low workload low risk 3 respondents (2.3%). The results of the correlation test using the Spearman test obtained p = 0.598 > 0.05, so it can be concluded that there is no significant correlation between workload and the risk of musculoskeletal disorders or in other words Ha is rejected and H_0 is accepted.

Table 4. Correlation between Ergonomic Position and Musculoskeletal Disorders in Nurses in the Inpatient Ward of Regional General Hospital

Ergonomic Position	Musculoskeletal Disorders						Total		*p Value*	*r Value*
	Low Risk		Moderate Risk		High Risk					
	f	%	f	%	f	%	f	%		
Ignored	39	29,5%	4	3%	0	0%	43	32,6%	0,000	0,348
Low	57	43,2%	15	11,4%	0	0%	72	54,5%		
Moderate	6	4,5%	3	2,3%	3	2,3%	12	9,1%		
High	1	0,8%	1	0,8%	3	2,3%	5	3,8%		

Based on the analysis results in table 4 regarding the correlation between ergonomic positions and musculoskeletal disorders in low ergonomic positions, it was found that 57 respondents (43.2%) experienced low risk, 15 respondents (1,4%) experienced moderate risk and no high risk (0%), while in negligible ergonomic positions, 39 respondents (29,5%) experienced low risk, 4 respondents (3%) experienced moderate risk and no high risk. Meanwhile, in high ergonomic positions, low and moderate risks were found, each with 1 respondent (0,8%) and 3 respondents (2,3%) at high risk. Then, in medium ergonomic positions, 6 respondents (4,5%) experienced low risk, and 3 respondents (2,3%) at moderate and high risk. The largest number was low ergonomic positions and low risk musculoskeletal disorders, namely 57% (43,2%). The correlation results using the Spearman test obtained a p-value = 0.000 ≤ 0.05, so it was concluded that Ha was accepted and H0 was rejected. In the test, the r value = 0.348 was also found, so that it can be interpreted that the correlation level is weak with the direction of the correlation. There is a

significant correlation between ergonomic positions and the risk of positive musculoskeletal disorders; namely, the more the ergonomic level can be ignored, the risk of musculoskeletal disorders will also be low.

DISCUSSION

The Correlation Between Work Duration and Musculoskeletal Disorders

The findings of studies examining the correlation between work duration and musculoskeletal disorders indicate that there is no significant association between workload and the risk of musculoskeletal disorders. The Spearman test results for the correlation test showed p = 0,166 > 0,05. This result is in line with research (Farahbakhsh et al., 2025) which states that there is no significant correlation between work duration and the incidence of musculoskeletal disorders, where workers with work durations of <8 hours, 8–10 hours, and >11 hours have relatively comparable proportions of incidents. These results are supported by research (Nopriani & Apriyandi, 2024) which states that there is no significant correlation between work duration and the occurrence of musculoskeletal disorders in 40 respondents (66.7%) with a value of (p value= 0,130)

According to (Mahajan et al., 2023) stated that as non-ergonomic body posture and static working positions are the main risk factors, job duration has no direct correlation with the prevalence of musculoskeletal problems in the majority of body parts. However, prolonged work hours have a minor impact on the rise in upper and lower back musculoskeletal symptoms, which are probably brought on by repetitive physical demands and prolonged working postures. Researchers assumed that respondents who worked more than eight hours a day were correlated with extended work days, which resulted in persistent static loads, unergonomic working postures, and repetitive exposure to physical activity. These illnesses can cause micro-injuries to soft tissues, joint stress, and muscle fatigue, all of which can eventually progress to musculoskeletal problems.

Correlation between Work Periond and Musculoskeletal Disorders

Based on the results of research related to the correlation between work period and musculoskeletal disorders, analysis results using the Spearman test can be concluded that there is no significant correlation with a p value of 0.137 > 0.05. This result is in line with research (Yundelfa, Mandria, 2025) that work period has no correlation with MSD complaints due to work factors that have a positive effect on the adaptation process, namely reducing tension and increasing activity or performance.

According to (Punnett & Wegman, 2004), Due to the accumulation of micro-trauma from physical demands and non-ergonomic postures, someone who works in a hazardous workplace for an extended period of time is more likely to acquire musculoskeletal problems. Hence, whereas shorter work times are often linked to a lower risk, longer work periods raise the possibility of complaints such as back discomfort, neck pain, and muscle injuries. According to the researchers' assumptions, the majority of nurses at the Ahmad Yani Regional General Hospital of Metro have a working period of ≤5 years, so the risk of musculoskeletal complaints is relatively lower because exposure to workloads and unergonomic postures is not long-term. Conversely, longer working periods increase the accumulation of microtrauma, which can potentially lead to musculoskeletal complaints.

Correlation between Workload and Musculoskeletal Disorders

Based on the research results related to the correlation between workload and musculoskeletal disorders, it is known that the results of the correlation test using the Spearman test obtained p = 0.598 > 0.05, so it can be concluded that there is no significant correlation between workload and the risk of musculoskeletal disorders. This result is in line with research (Krishnan et al., 2021) which concluded that workload showed no significant correlation with musculoskeletal complaints in nurses. Although workload is one of the demands of the nursing profession, the main factors

causing high levels of musculoskeletal complaints stem from physical conditions, lifestyle, and an unergonomic work environment, not solely from the perceived workload.

This research is supported by (Amanta Nur Ramadhani, 2025) which asserts that there is no correlation between musculoskeletal disorders and workload. Working non-stop is not always the only way to understand a heavy assignment. When a high workload is combined with adequate and consistent rest times, a comparatively low level of musculoskeletal symptoms may actually arise. These rest periods are essential for protection because they give muscles and joints a chance to recover from stress and exhaustion. (Amanta Nur Ramadhani, 2025).

According to (Ding et al., 2023) Due to employment demands that require awkward postures, extended sitting, and daily repetition of tasks, the workforce is confronted with a comparatively high burden. The physical strain is further increased by elements such as extended workdays, a high task repetition rate, and little downtime. When nurses work more than 36 hours a week, workload is not always correlated with MSDs. Workload and the degree of these physiological stress reactions did not correlate significantly, despite the fact that the majority of respondents reported experiencing back discomfort, exhaustion, and stiff neck. This indicates that musculoskeletal diseases that are statistically detectable may not necessarily result from a significant physical workload. According to the researcher's assumption, nurses working in the Regional General Hospital's inpatient ward have a high workload but a low risk of musculoskeletal disorders. This is partly because POSs help nurses in the inpatient ward with administrative and nursing tasks, giving them more time to rest.

Correlation between Ergonomic Position and Musculoskeletal Disorders

Based on the correlation results using the Spearman test, a p-value of $0.000 \leq 0.05$ was obtained, thus concluding that there is a significant correlation between ergonomic positions and the risk of musculoskeletal disorders. The test also found an r value of 0.348, which means the level of correlation is weak with a positive correlation, meaning that the more negligible the ergonomic level, the lower the risk of musculoskeletal disorders. Strengthened by research (Anyelir et al., 2024) which states that there is a significant correlation between work posture and musculoskeletal complaints ($p = 0.033$; $r = 0.367$), which means that the less ergonomic the nurse's work posture, the higher the likelihood of MSDs complaints. This proves that abnormal work positions, such as bending statically for long periods when administering IVs or wound care, play a significant role in increasing the risk of musculoskeletal disorders. The study of ergonomics aims to reduce the risk of injury, especially work-related musculoskeletal diseases (WMSDs), while creating an effective workspace by aligning task needs with worker skills and the work environment. Although ergonomics first concentrated on the physical elements that raise the risk of WMSDs, more recent studies have revealed a strong correlation between ergonomics and psychosocial aspects. The implementation of ergonomics seeks to enhance job satisfaction, increase productivity, and lower the risk of disease and injury. Risk factors such as repetitive motion, vigorous activity, awkward posture, or hard physical work can cause or worsen WMSDs, which include injuries to the upper extremities, neck, and back. Ergonomics places a high premium on lowering WMSDs in order to create a more productive and healthy workplace. (Andersen et al., 2021).

Musculoskeletal disorders (MSDs) are a common and growing occupational health issue in workplaces around the world. Workplace MSDs are often caused by a combination of physical, ergonomic, and psychological factors. These conditions include damage or problems to the joints, cartilage, tendons, muscles, nerves, and spinal discs. The prevalence of occupational MSDs in the healthcare industry, especially among nurses, has been found to range from 28% to 96% in a single year (Korhan & Memon, 2019). Important duties for nurses generally involve providing physical care, which requires extended durations of body flexion. Physical tasks like lifting patients, helping them to the lavatory, bathing them, making beds, pushing gurneys, pushing carts of medical

equipment, and other patient support-related movements like carrying, pressing, pulling, lifting, and waist movements are all associated with this flexion. (Ananta & Dirdjo, 2021). Based on the researcher's assumption that musculoskeletal diseases in nurses are significantly correlated with ergonomic situations. Because they have adopted appropriate work positions, the majority of respondents to this study fall into the low risk category. However, a small percentage of nurses continue to use non-ergonomic work positions, such as standing on one leg, lifting patients, pushing or pulling beds, installing or removing IVs in static positions, changing dressings, and excessive bending, which puts them in the moderate risk category and even puts two nurses in the high risk category.

CONCLUSION

There is a correlation between ergonomic positions and musculoskeletal disorders in inpatient nurses at the Regional General Hospital. There is no correlation between workload and musculoskeletal disorders in inpatient nurses at the Regional General Hospital. There is no correlation between work period and musculoskeletal disorders in inpatient nurses at the Regional General Hospital. There is no correlation between work duration and musculoskeletal disorders in inpatient nurses at the Regional General Hospital.

REFERENCES

Amanta Nur Ramadhani, T. (2025). Hubungan Sikap Kerja dan Beban Kerja terhadap Keluhan Musculoskeletal Disorders (MSDs) pada Petani Bawang Merah di Nganjuk. Jurnal Lentera Kesehatan Masyarakat, 4(1), 1–10. https://doi.org/10.69883/jlkm.v4i1.65

Ananta, P. G., & Dirdjo, M. M. (2021). Hubungan antara beban kerja dengan kinerja perawat di rumah sakit: suatu literature review. Borneo Student Research, 2(2), 929. https://journals.umkt.ac.id/index.php/bsr/article/download/1565/784

Andersen, L. L., Vinstrup, J., Sundstrup, E., Skovlund, S. V., Villadsen, E., & Thorsen, S. V. (2021). Combined ergonomic exposures and development of musculoskeletal pain in the general working population: A prospective cohort study. Scandinavian Journal of Work, Environment and Health, 47(4), 287–295. https://doi.org/10.5271/sjweh.3954

Anyelir, N. P., Fitri, N., Jenrivo, F., & Riswari, R. M. (2024). The Relationship Between Work Posture and Work Period with Musculoskeletal Disorders (MSDs) Complaints in Nurses in the Emergency Room (IGD) at Gambiran Hospital, Kediri City. Media Publikasi Promosi Kesehatan Indonesia, 7(8), 2208–2214. https://doi.org/10.56338/mppki.v7i8.5766

Arora, S. N., & Khatri, S. (2022). Prevalence of work-related musculoskeletal disorder in sitting professionals. International Journal Of Community Medicine And Public Health, 9(2), 892. https://doi.org/10.18203/2394-6040.ijcmph20220259

Farahbakhsh, S., Faryabi, R., Raesi, R., Hushmandi, K., Nasab, H. V., & Daneshi, S. (2025). Prevalence and Associated Factors of Musculoskeletal Disorders (MSDs) among Greenhouse Workers. The Open Rheumatology Journal, 19(1), 1–8. https://doi.org/10.2174/0118743129386825250430092404

Krishnan, K. S., Raju, G., & Shawkataly, O. (2021). Prevalence of work-related musculoskeletal disorders: Psychological and physical risk factors. International Journal of Environmental Research and Public Health, 18(17). https://doi.org/10.3390/ijerph18179361

Mahajan, D., Gupta, M. K., Mantri, N., Joshi, N. K., Gnanasekar, S., Goel, A. D., Srinivasan, S., Gonade, N. M., Sharma, S. K., Garg, M. K., & Bhardwaj, P. (2023). Musculoskeletal disorders among doctors and nursing officers : an occupational hazard of overstrained healthcare delivery system in western Rajasthan, India. BMC Musculoskeletal Disorders, 24(1), 1–10. https://doi.org/10.1186/s12891-023-06457-z https://doi.org/10.24853/eohjs.3.2.161-172 ina makassar. 5, 10179–10186.

Wulandari, R. Y., Yunitasari, E., Hakim, A. R., & Prasandi, A. (2022). Correlation Between Nurse Time Management with Documentation of Nursing Care in The Inpatient Room of Muhammadiyah Hospital in Metro. *Jurnal Aisyah: Jurnal Ilmu Kesehatan*, *7*(S1), 67-72.