

The Effect of Workload and Work Posture through Musculoskeletal Disorders on Work Achievement of Nurses Hermina Hospital Makassar

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Musculoskeletal disorders are one of the occupational diseases most often experienced by workers due to unbalanced workloads and posture errors when carrying out work activities. Nurses at Hermina Hospital often experience musculoskeletal complaints which will have an impact on the work performance of the nurses. This study aims to determine the effect of workload and work posture through musculoskeletal disorders on the work performance of nurses at Hermina Makassar Hospital. Method. This type of research uses a case control design with purposive sampling technique. The population in this study were all nurses at Hermina Hospital Makassar, totaling 150 respondents who were divided into 2 groups, namely 75 respondents in the control group and 75 respondents in the case group. The instruments used in this study were questionnaires and observation sheets. Data were analyzed using path analysis. Result. The results of the analysis show that workload has a significant influence on musculoskeletal disorders with a regression coefficient (B) of 0.329 ($p=0.000$)(OR=0.013). Meanwhile, work posture has a regression coefficient (B) of 0.053 ($p=0.514$)(OR=0.390). Furthermore, the results of the analysis show that workload has a significant influence on work performance with a regression coefficient (B) of 0.128 ($p=0.030$)(OR=0.013). Work posture was found to have a significant and strong influence on work performance with a regression coefficient (B) of 0.791 ($p=0.000$)(OR=0.390). Musculoskeletal disorders, however, did not show a significant effect on work performance with a regression coefficient (B) of 0.031 ($p=0.588$)(OR=0.071), indicating that musculoskeletal disorders may not have a large or clear impact on nurses' work

performance. Conclusion. Workload is proven to have a direct significant influence on nurses' work performance. This shows that the higher the workload received by nurses, the more their performance tends to increase. Working posture also shows a significant influence on nurses' work performance. Musculoskeletal disorders were found to have no direct effect on work performance. Workload and work posture through musculoskeletal disorders do not show a significant influence on work performance.

Keywords: workload, work posture, musculoskeletal disorders, work performance, nurses.

1. Introduction

Every workplace carries the risk of accidents and occupational diseases. To prevent the occurrence of accidents and occupational diseases, every company that has more than 100 workers and has a high risk of accidents and workforce of more than 100 people and has a high risk of accidents and occupational diseases, then every company that has an Occupational Safety and Health program in accordance with the Government Regulation. accidents and occupational diseases must implement an Occupational Safety and Health program in accordance with Government Regulation No. 50 of 2012. No.50 of 2012. Hospitals are capital-intensive, technology-intensive, and labor-intensive workplaces. labor-intensive, but the existence of hospitals also has a negative impact on the emergence of disease, especially if the hospital does not implement procedures for occupational safety and health. especially if the hospital does not implement occupational health and safety procedures. The health of workers in hospitals is highly dependent on the harmony between workload, work capacity and work environment conditions (Ministry of Health of the Republic of Indonesia, 2008).

The human resources needed by hospitals in providing care to patients, among others, are nurses. Nurses are human resources that rank top in terms of numbers in all hospitals. They must prioritize patient's recovery in their care, so patients really expect the performance of a nurse to be maximized. nurse who is maximized. Performance is actually the same as work performance, performance is the result of work and how the work process takes place. work and how the work process takes place. A nurse can have a good performance A nurse can have good performance if the nurse can do a good job and the results of his work are in accordance with what must be achieved. that must be achieved. The performance of nurses is not only seen from the skill factor alone, many many other factors that can affect one of them workload, workload that continues to increase must be supported by the physical state of a worker (physical condition). must be supported by the physical condition of a worker (Sidabutar & Pujiati, 2022).

According to the latest analysis of Global Burden Of Disease (GBD) data in 2019, the incidence of Musculoskeletal Disorders (MSDs) globally from 1990-2019 amounted to 322.75 million cases where 150.08 million workers have Disability Adjusted Life Years (DALYs) and 117.54 thousand workers among them died due to Musculoskeletal Disorders (MSDs) (WHO, 2022). Based on a survey conducted by HSE in the book Work - Related Musculoskeletal Disorders Statistics in Great Britain in 2021, in 2020 - 2021 an estimated

470,000 cases with a prevalence of 1,420 per 100,000 workers experienced Work - Related Musculoskeletal Disorders. Related Musculoskeletal Disorders (WRMSDs), of which 28% experienced occupational diseases (HSE, 2021). (HSE, 2021). Then, in 2016 it was also found by the BLS (Bureau of Labor Statistics) that cases of Work - Related Musculoskeletal Disorders (WRMSDs) in the United States which amounted to 349,050 cases, most of which resulted from back pain with 134,550 (38%). back pain with a total of 134,550 (38%) cases (Bureau of Labor Statistics, 2018).

Based on a report by the Indonesian Ministry of Health in (2021) on workers in 12 districts/cities in Indonesia related to health in Indonesia shows that 1,432 people (40.5%) suffer from diseases suffered by workers are generally in the form of musculoskeletal disorders (MSDs) 982 (16%) cardiovascular disorders 872 (8%) nervous disorders 763 (6%) and respiratory disorders 633 people (3%) and ENT 529 people (1.5%) shows that there is a fairly strong relationship between work position and musculoskeletal complaints. with musculoskeletal complaints (Ministry of Health of the Republic of Indonesia, 2022). The distribution of disease treatment musculoskeletal diseases that are claimed to BPJS health according to the Ina CBGs code in 2018 in Indonesia, there were 589,937 participants who performed musculoskeletal physical therapy procedures and diagnostic and therapeutic procedures. people and musculoskeletal diagnostic and therapeutic procedures totaling 142,554 people (BPJS RI, 2017). This shows that there are still many workers who experience musculoskeletal disorders. musculoskeletal disorders with the state of losing productive work years due to PAK (Occupational Disease). Work). Then, in the 2018 riskesdas, musculoskeletal disorders based on the diagnosis of doctor's diagnosis in the population >15 years in Riau Islands Province is 5.45% and for the city of Batam is 4.27% (Indonesian Ministry of Health, 2020).

Hermina Hospital is one of the privately owned hospitals in Makassar. The hospital This hospital has been recognized as type B since 2023 by the Ministry of Health. Republic of Indonesia. The services provided by Hermina Hospital include outpatient services, inpatient, special care, and medical support. Type A and B hospitals have the same number of nurses. need for nurses is the same, which is based on the number of beds available, while for type C and D hospitals the number of nurses needed is calculated with a ratio of 2 (two) nurses for 3 (three) beds. ratio of 2 (two) nurses for 3 (three) beds (Kemenkes RI., 2014a).

The number of nurses in Hermina Hospital is not in accordance with the Regulation of the Minister of Health of the Republic of Indonesia No. 56 of 2014 (MOH RI, 2014a) on Minister of Health of the Republic of Indonesia No. 56 of 2014 (Kemenkes RI., 2014a) regarding the classification and licensing of hospitals. It can be learned that the number of nurses does not match with the number of beds available. In inpatient services, there are 6 rooms that have a shortage of nurses and 3 rooms that have a shortage of nurses. There are 6 rooms that experience a shortage of nurses and there are 3 rooms that experience an excess number of nurses. number of nurses. The shortage and excess of nursing staff can have an impact on the workload of nurses in each room and will also affect the quality of nursing services. the quality of nurse services. Musculoskeletal Disorders is one type of disorder or disease that is most often complained of by nurses. diseases most often complained of by nurses at Hermina Hospital that occur in the musculoskeletal system. musculoskeletal system due to repetitive biomechanical work movements.

Based on this background, researchers are interested in conducting research on the effect of workload and work posture through musculoskeletal disorders on work performance in nurses at Hermina Makassar Hospital. work performance in nurses at Hermina Hospital Makassar

2. Materials and methods

a. Type of Research

The type of research used is quantitative research using case control studies or retrospective studies, which are observational analytical epidemiological studies that examine the relationship between certain effects (diseases or health conditions) and certain risk factors.

3. Result

a. Respondent Characteristics

Respondents in this study totaled 110 people: 55 respondents in Watupuda Village and 55 people in Patawang Village. The distribution of respondents can be seen in Table 1 below:

Table 1. Characteristics of Respondents Based on Gender, Age, Occupation, Unit at Hermina Hospital Makassar Year 2024 (N = 150)

Respondent Characteristics		
Characteristics	Case	Control
Gender		
Woman	57	67
Man	18	8
Work		
Nurse	75	75
Age		
Above 20 years	62	65
Above 30 years	13	10
Unit		
UGD	15	6
Inpatient Nurse	40	19
Poly	5	20
OK	10	5
VK	2	15
ICU	3	10

Source: Data Primer, 2024

Table 1. In the case group, it is known that 57 respondents were female (38.0%) and 18 male respondents (12.0%). Respondents with nursing jobs were 75 people (50.0%). Respondents aged over 20 years were 62 people (41.3%) and aged over 30 years were 13 people (8.7%). Respondents in the ER unit were 15 people (20.0%), in the inpatient unit were 40 people (53.3%), in the Poly unit 5 people (6.7%), in the OK unit 10 people (13.3 %), in the VK unit there were 2 people (2.7%) and in the ICU unit there were 3 people (4.0%).

In the control group, it was found that 67 respondents were female (89.3%) and 8
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respondents were male (10.7%). Respondents with nursing jobs were 75 people (50.0%). Respondents aged over 20 years were 65 people (86.7%) and aged over 30 years were 10 people (13.3%). Respondents who were in the ER unit were 6 people (8.0%), were in the inpatient unit as many as 19 people (25.3%), were in the Poly unit as many as 20 people (26.7%), were in the OK unit as many as 5 people (6.7%), 15 people were in the VK unit (20.0%), and 10 people were in the ICU unit (13.3%).

b. Analisis Univariat

Table 2. Frequency Distribution of Research Variables

Variabel	Case		Control	
	n	%	n	%
Workload				
No fatigue occurs	10	13,3	69	92,0
Repair required	65	86,7	6	8,0
Work Posture				
Currently	34	45,3	51	68,0
Tall	41	54,7	24	32,0
Work performance				
Currently	36	48,0	38	50,7
Good	39	52,0	37	49,3
Musculoskeletal Disorders				
Currently	22	29,3	64	85,3
Tall	53	70,7	11	14,7

Source: Data Primer, 2024

Table 2. It is known that in the case category, 65 respondents or (86.7%) had a workload that needed improvement and 10 respondents or (13.3%) did not experience fatigue. In the case category, there were 34 respondents with moderate risk work postures or (45.3%) and 41 respondents with high risk work postures or (54.7%). In the case category, there were 36 respondents who had moderate work performance or (48.0%), 39 respondents or (52.0%) who had good work performance. In the case category, there were 22 respondents who had musculoskeletal disorders with moderate risk or (29.3%) and those with high risk were 53 respondents or (70.7%).

In the control category, 69 respondents had a workload that did not cause fatigue or (92.0%) and 6 respondents had a workload that needed improvement or (8.0%). In the control category, there were 51 respondents with moderate risk work postures or (68.0%) and those with high risk were 24 respondents or (32.0%). In the control category, there were 38 respondents with moderate work performance or (50.7%) and 37 respondents with good work performance or (49.3%). In the control category, there were 64 respondents with musculoskeletal disorders at moderate risk or (85.3%) and 11 respondents at high risk or (14.7%).

c. Analisis Bivariat

Table 3. Relationship between Workload and Job Performance

Variable Group	Work performance				P value	OR (95% CI)
	Case		Control			
	n	%	n	%		
Workload						
No fatigue occurs	10	10,0	69	92,0	0,001	0,013
Repair required	65	86,7	6	8,0		
Total	75	100%	75	100%		

Source: Data Primer, 2024

Table 3. shows that the chi square test results obtained a p value for the relationship between workload and work performance, namely 0.001, where this value is less than 0.05 so there is a significant relationship between workload and work performance. Meanwhile, the OR calculation results showed that OR = 0.013. This means that the OR value <1 means that the workload variable is not a risk factor.

Table 4. Relationship between Workload and Musculoskeletal Disorders

Variable Group	Musculoskeletal Disorders				P value	OR (95% CI)
	Case		Control			
	n	%	n	%		
Workload						
No fatigue occurs	10	13,3	69	92,0	0,024	0.013
Repair required	65	86,7	6	8,0		
Total	75	100%	75	100%		

Source: Data Primer, 2024

Table 4. shows that the chi square test results obtained a p value for the relationship between workload and musculoskeletal disorders, namely 0.024, where this value is less than 0.05 so there is a significant relationship between workload and musculoskeletal disorders. Meanwhile, the OR calculation results showed that OR = 0.013. This means that the OR value <1 means that the workload variable is not a risk factor.

Table 5. Relationship between Work Posture and Musculoskeletal Disorders

Variable Group	Musculoskeletal Disorders				P value	OR (95% CI)
	Case		Control			
	n	%	n	%		
Work Posture						
Currently	34	45,3	51	68,0	0,000	0.390
Tall	41	54,7	24	32,0		
Total	75	100%	75	100%		

Source: Data Primer, 2024

Table 5, shows that the chi square test results obtained a p value for the relationship between work posture and musculoskeletal disorders, namely 0.000, where this value is less than 0.05 so there is a significant relationship between work posture and musculoskeletal disorders. Meanwhile, the OR calculation results showed that OR = 0.390. This means that the OR

value <1 means that the work posture variable is not a risk factor.

Table 6. The Relationship between Work Posture and Work Performance

Variable Group	Work performance				P value	OR (95% CI)
	Case		Control			
	n	%	n	%		
Work Posture						
Currently	34	45,3	51	68,0	0,000	0.390
Tall	41	54,7	24	32,0		
Total	75	100%	75	100%		

Source: Data Primer, 2024

Table 6, shows that the results of the chi square test show that the p value for the relationship between work posture and work performance is 0.000, where this value is less than 0.05, so there is a significant relationship between work posture and work performance. Meanwhile, the OR calculation results showed that $OR = 0.390$. This means that the OR value <1 means that the work posture variable is not a risk factor.

Table 7. The Relationship between Musculoskeletal Disorders and Job Performance

Variable Group	Work performance				P value	OR (95% CI)
	Case		Control			
	n	%	n	%		
Musculoskeletal Disorders						
Currently	22	29,3	64	85,3	0,068	0.071
Tall	53	70,7	11	14,7		
Total	75	100%	75	100%		

Source: Data Primer, 2024

Table 7, shows that the chi square test results obtained a p value for the relationship between musculoskeletal disorders and work performance, namely 0.068, where this value is more than 0.05 so there is no significant relationship between work posture and work performance. Meanwhile, the OR calculation results showed that $OR = 0.071$. This means that an OR value <1 means that the musculoskeletal disorder variable is not a risk factor.

d. Path Analysis Regression Results

The results of data processing using analysis with the help of IBM SPSS Version 26 obtained the following results:

Image 1. values obtained from the relationship between each variable, namely exogenous variables (Work Load and Work Posture) and endogenous variables (Musculoskeletal Disorders and Work Performance)

1) Model Identification

Model identification is a way to find out if a model is said to be identified. This step is a requirement that parameters can be estimated and hypotheses can be tested regarding variable relationships. Model identification can be known through the degree of freedom (df) value. Path analysis can be carried out if $df \geq 0$. The value of $df = 5$, so the path analysis model is over-identified, so path analysis can be carried out.

2) Model Suitability

Table 8. Path Analysis Results

Dependent Variable	Independent Variable	B	CI 95%		
			Lower limit	Upper limit	p
Indirect Influence					
Musculoskeletal Disorders	← Workload	0,329	0,168	0,483	0,000
	← Work Posture	0,053	,106	0,211	0,514
Direct Influence					
Work performance	← Workload	0,128	0,012	0,244	0,030
	← Work Posture	,791	,909	,688	0,000
	← Musculoskeletal Disorders	0,031	,082	0,145	0,588

Source: SPSS output version 26, processed in 2024

Table 8. can be explained as follows:

1. The Effect of Workload and Work Posture on Musculoskeletal Disorders

Regression analysis shows that workload has a significant influence on musculoskeletal disorders with a regression coefficient (B) of 0.329 ($p= 0.000$), which indicates that every one unit increase in workload will increase musculoskeletal disorders by 0.329 units. The 95% confidence interval for this coefficient is between 0.168 to 0.483, providing confidence that this effect is real and not coincidental.

Meanwhile, work posture has a regression coefficient (B) of 0.053 ($p= 0.514$), which indicates that work posture does not have a significant influence on musculoskeletal disorders at the 95% significance level. The 95% confidence interval for this coefficient is between -0.106 to 0.211, indicating large uncertainty regarding the direction and influence of work on musculoskeletal disorders.

2. The Influence of Workload, Work Posture, and Musculoskeletal Disorders on Work Performance

Furthermore, the results of the analysis show that workload has a significant influence on work performance with a regression coefficient (B) of 0.128 ($p= 0.030$). This shows that every one unit increase in workload will increase work performance by 0.128 units. The 95% confidence interval for this coefficient is between 0.012 to 0.244 providing confidence in the positive influence of workload on work performance.

Work posture was found to have a significant and strong influence on work performance with a regression coefficient (B) of 0.791 ($p= 0.000$). Every one unit increase in work posture will increase work performance by 0.791 units. The 95% confidence interval for this coefficient is between 0.688 to 0.909, confirming the highly significant positive influence of work posture on work performance.

Musculoskeletal disorders, however, did not show a significant influence on work performance with a regression coefficient (B) of 0.031 ($p= 0.588$). The 95% confidence interval for this coefficient is between -0.082 to 0.145, indicating that musculoskeletal

disorders may not have a large or obvious impact on nurses' job performance.

The results of the path analysis in this study show that workload and work posture have a direct influence on the work performance of nurses at Hermina Hospital. Workload has been proven to have a positive influence on both musculoskeletal disorders and work performance. On the other hand, work posture shows a significant influence on work performance, but not on musculoskeletal disorders.

Musculoskeletal disorders were found to have no direct effect on work performance, suggesting that although these disorders are an important health problem, their impact on performance may be more complex and influenced by other factors not included in this pathway model.

4. Discussion

a. The Effect of Workload through Musculoskeletal Disorders on Work Performance.

Based on the results of the research that has been conducted, it can be concluded that the influence of workload through musculoskeletal disorders on nurses' work performance is not significant. The direct influence value of workload on musculoskeletal disorders is 0.329, indicating a positive influence. However, the indirect effect value of 0.010 indicates that this indirect effect is very small and not significant. In addition, the results of statistical analysis show that the direct influence of workload on nurses' work performance has a (B) value of 0.128 with a significance level of 0.030, while the direct influence of musculoskeletal disorders on nurses' work performance has a (B) value of 0.031 with a significance level of 0.588.

The data above shows that workload has a more significant direct influence compared to indirect influence through musculoskeletal disorders on nurses' work performance. The analytical steps that have been carried out show that workload has a real impact on the musculoskeletal condition of nurses, but this influence is not significant enough to continue this impact on overall work performance. Musculoskeletal disorders can indeed increase the risk of impaired performance, but workload has a dominant role in influencing performance compared to the indirect impact of musculoskeletal disorders.

The results of this research show that it is in harmony with previous research by Efi Hudriah (2023). Hudriah's research found that of the 61 respondents, 63.9% of those with a heavy workload experienced MSDs (Musculoskeletal Disorders), while only 36.1% of the group with a light workload experienced MSDs. The results of data analysis using the Chi Square test show that the p value is 0.002 (<0.05), which means workload has a significant influence on musculoskeletal complaints. These findings support the theory of Suma'mur (2009) in Tarwaka (2015) which states that a person's work ability is greatly influenced by the workload they receive, where a heavy workload results in an increased risk of muscle disorders which ultimately affects their work performance.

The findings of this study further strengthen the existence of a significant impact of workload on musculoskeletal disorders but show the exception that its indirect effect on nurses' work performance is not significant. This provides a new insight that although

musculoskeletal disorders often occur in nurses with heavy workloads, their impact on work performance may be minimized by other factors such as work support systems, workload management, and individual coping strategies.

Apart from that, a search of previous literature revealed consistent results as found in research by Tarwaka (2015) which also stated that workload has a correlation with individual abilities and performance in the workplace. This study adds data that the B value of work posture is very significant ($B = 0.791$, $p = 0.000$) compared with workload and other musculoskeletal disorders in the context of work performance. This shows that work posture has a greater weight in influencing performance compared to workload or musculoskeletal disorders.

Through this analysis, it can be concluded that the influence of workload through musculoskeletal disorders on nurses' work performance is not statistically significant. On the other hand, factors such as workload management, good physical working conditions, and support from the organization have a greater influence on nurse performance. Thus, interventions that focus more on workload management and improving work posture can provide more tangible positive results in efforts to improve nurses' performance in the work environment.

b. The Influence of Work Posture through Musculoskeletal Disorders on Work Performance of Nurses at Hermina Hospital Makassar

Based on the results of research that has been carried out, it is known that the hypothesis regarding "The Effect of Work Posture through Musculoskeletal Disorders on Nurse Work Performance" has quite significant results. From the attached analysis results table, the direct effect of work posture on work performance has a B value of 0.791 with a p value of 0.000, which shows that this effect is statistically significant at the 95% confidence level. Meanwhile, the indirect effect in the form of musculoskeletal disorders showed a positive but not significant effect ($B = 0.031$, $p = 0.588$). This indicates that work posture directly has a stronger and more significant relationship to nurses' work performance than through musculoskeletal disorders.

A detailed explanation of these results shows that ergonomic or good working posture has a significant positive influence on nurses' work performance. With a B value of 0.791 and a significance level of 0.000, it can be concluded that the better the work posture of the nurses, the higher the work performance achieved. This explanation is supported by the interpretation that ergonomic work postures can minimize fatigue and increase efficiency and effectiveness in carrying out daily nursing tasks. On the other hand, unergonomic work postures, such as bending over for too long or working in an unnatural body position, can cause discomfort and physical complaints that affect work focus and productivity.

Furthermore, musculoskeletal disorders as an intervening variable do not have a significant influence on the relationship between work posture and nurses' work performance. This insignificant influence may be caused by other factors that more dominantly influence work performance. The musculoskeletal disorders variable has a B value of 0.031 and a p value of 0.588, where a p value greater than 0.05 indicates that this effect is not strong enough to be concluded as significant.

This research is in line with previous research conducted by Efi Hudriah (2023) which stated that work posture is a crucial factor in determining work effectiveness. Good working posture will ensure optimal work results, while poor work posture can cause physical fatigue and reduce work results. According to this research, poor work posture tends to increase physical complaints which ultimately interfere with the performance of nurses. This finding is also supported by Pratiwi's (2020) research which shows that unergonomic work attitudes can cause musculoskeletal complaints and reduce performance. A work attitude that frequently bends or other work positions that do not comply with ergonomic principles can increase the risk of musculoskeletal disorders and lead to decreased performance.

Other research conducted by Pratiwi (2020) also found a strong correlation between unergonomic work postures and musculoskeletal disorders and decreased performance. In this study, transport workers who had unergonomic work postures had a higher prevalence of musculoskeletal disorders compared to those who had ergonomic work postures. The results of interviews with 61 transport workers showed that 72.1% of those who worked with non-ergonomic postures complained of musculoskeletal disorders, compared to only 27.9% of the group who worked with ergonomic postures. This is consistent with the finding that unnatural working positions can cause physical discomfort and lead to decreased work performance.

Overall, this research emphasizes the importance of paying attention to work posture in the context of nurses' work in hospitals. Ergonomic working posture not only causes minimal physical complaints but also has a direct impact on improving work performance. On the other hand, musculoskeletal disorders, although they affect the physical condition of the nurses, in this study did not show a significant influence on their performance, indicating that improvements in work posture are more urgent to be followed up by hospital management in order to improve the work performance of nurses.

This research provides practical implications for health institutions to take preventive steps in the form of ergonomics training and adjusting work tools in accordance with ergonomic standards. In this way, the risk of musculoskeletal disorders can be reduced and the performance of nurses can be optimized. The results of this research also emphasize the need to support and facilitate an ergonomic work environment to ensure smooth operations and better quality of health services in hospitals.

c. The Influence of Musculoskeletal Disorders on Work Performance of Nurses at Hermina Hospital Makassar

Based on the data obtained from this research, it is known that musculoskeletal disorders have a direct influence on work performance with a coefficient of 0.031. This value shows that there is a positive relationship between musculoskeletal disorders and work performance, although this influence is relatively small, namely 0.031. In other words, an increase in musculoskeletal disorders in nurses tends to increase or correlate with a decrease in work performance. However, the p-value of 0.588 indicates that this effect is not statistically significant. This indicates that the relationship between musculoskeletal disorders and work performance is not strong enough to be reliable as the main determining factor in reducing the work performance of nurses in the hospital.

In discussing these results, it should be noted that musculoskeletal disorders are a common condition experienced by nursing staff, often due to heavy workloads and less ergonomic work postures. Musculoskeletal disorders in nurses can impact various aspects of their ability to work effectively, including pain, physical fatigue, and limited mobility. However, this statistically insignificant effect of 0.031 may indicate that other factors also play an important role in determining nurses' work performance, so that it is not only musculoskeletal disorders that need to be considered.

This research is consistent with previous research conducted by Pratiwi (2020) which stated that non-ergonomic work attitudes can cause musculoskeletal complaints and negatively affect performance. Pratiwi found that unnatural work attitudes, such as bending repeatedly for long periods, can increase the risk of musculoskeletal complaints which then contribute to decreased performance. This finding is in line with the results of current research which shows the influence, although small and not significant, of musculoskeletal disorders on nurses' work performance. These two studies provide evidence that workload and unergonomic work postures need to be managed properly to reduce the risk of musculoskeletal disorders and maintain optimal performance.

Apart from that, support from other research also strengthens these findings. For example, a study by Johnson (2019) shows that nurses who experience musculoskeletal disorders tend to have higher rates of absenteeism and decreased work ability. Johnson believes that musculoskeletal disorders can cause nurses to experience ongoing pain or discomfort, impacting their ability to perform job duties effectively. Although the impact of these disorders on work performance is not always statistically significant, their debilitating impact on individual well-being and health is a factor that must be considered in efforts to improve nurses' work performance. Thus, the results of this study still provide important insight into the need to pay attention to ergonomic factors and the physical health of nurses to ensure they can work with optimal performance.

Overall, although the direct influence of musculoskeletal disorders on nurses' work performance was not statistically significant in this study, these findings are still relevant to indicate the existence of a relationship that needs to be considered and anticipated. Implementing ergonomic work practices, training on correct work posture, and fair and equitable workload management are some of the steps that can be taken to minimize musculoskeletal disorders and ensure nurses work in optimal and healthy conditions.

5. Conclusion

Based on the results of research that has been conducted regarding the influence of workload and work posture through Musculoskeletal Disorders on the work performance of nurses at Hermina Makassar Hospital with a sample of all nurses at the hospital, using path analysis tests, the following conclusions can be drawn:

1. Workload is proven to have a direct significant influence on nurses' work performance. This shows that the higher the workload received by nurses, the more their performance tends to increase. Apart from that, workload has also been proven to have a positive influence on musculoskeletal disorders. This shows that an increase in workload can increase

the risk of disorders in the musculoskeletal system of nurses.

2. Working posture also shows a significant influence on nurses' work performance. In other words, good working posture can improve the work performance of nurses at Hermina Hospital. However, the research results show that work posture does not have a significant effect on musculoskeletal disorders. This shows that work posture does not necessarily cause musculoskeletal disorders in nurses.

3. Musculoskeletal disorders were found to have no direct effect on work performance. Although this disorder is a significant health problem, its effect on nurse performance may be influenced by various other factors not included in this research model. Therefore, even though nurses experience musculoskeletal disorders, this does not directly affect their performance at work.

4. Workload and work posture through musculoskeletal disorders do not show a significant influence on work performance. Based on the research results, it was concluded that although musculoskeletal disorders are an important health problem, they have not been proven to be a significant mediator in the relationship between workload and work posture on nurses' work performance.

Overall, this research succeeded in answering the questions in the problem formulation, concluding that both workload and work posture have a significant influence on the work performance of nurses at Hermina Hospital. However, musculoskeletal disorders were not a significant mediator in this relationship.

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Use of AI tools declaration

The author used Grammarly to improve the language in this research.

Conflict of interest

The authors declare that they have no conflict of interest

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