

ORIGINAL

The Influence of Workload, Work Shifts, Dual Role Conflict on Performance Through Work Stress in Female Nurses of RSUD Makassar City 2025

La influencia de la carga de trabajo, los turnos laborales y el conflicto entre roles en el rendimiento a través del estrés laboral en las enfermeras del RSUD de la ciudad de Makassar 2025

Vitra Amanda¹  , Masyitha Muis¹ , Lalu Muhammad Saleh¹ 

¹Hasanuddin University, Department of Occupational Health and Safety. Makassar, Indonesia.

Cite as: Amanda V, Muis M, Muhammad Saleh L. The Influence of Workload, Work Shifts, Dual Role Conflict on Performance Through Work Stress in Female Nurses of RSUD Makassar City 2025. Salud, Ciencia y Tecnología. 2026; 6:2473. <https://doi.org/10.56294/saludcyt20262473>

Submitted: 09-08-2025

Revised: 12-10-2025

Accepted: 13-11-2025

Published: 01-01-2026

Editor: Prof. Dr. William Castillo-González 

Corresponding Author: Vitra Amanda 

ABSTRACT

Introduction: the nursing profession has a high risk of experiencing work stress due to large workloads and responsibilities, which have a negative impact on the quality of their services and performance.

Method: this study used a quantitative approach with a cross-sectional design. The sample of this study was 104 respondents selected by probability sampling technique. Physical workload was measured by %CVL (Cardio Vascular Load), NASA-TLX mental workload, work shift, dual role conflict, work stress and performance using measured using a questionnaire. Data analysis using AMOS-based path analysis.

Results: based on the analysis at 95 % confidence level (CI = 0,05), nurses' performance was significantly affected by physical workload (p = 0,000), mental workload (p = 0,007), work shift (p = 0,031), as well as work stress (p = 0,000), while work stress was mainly mediated by mental workload (p = 0,015); indirect effect = -0,022) and dual role conflict (p = 0,000; indirect effect = -0,042), while physical workload (p = 0,112; indirect effect = -0,111) and work shifts (p = 0,075; indirect effect = -0,064) had no significant effect on stress nor indirectly on performance.

Conclusions: nurses' performance is influenced directly by workload, work shift and work stress and indirectly by mental workload and dual role conflict.

Keywords: Workload; Physical Workload; Mental Workload; Shift; Work Stress; Nurse Performance; Dual Role Conflict.

RESUMEN

Introducción: la profesión de enfermería presenta un alto riesgo de sufrir estrés laboral debido a la gran carga de trabajo y las responsabilidades, lo que repercute negativamente en la calidad de sus servicios y su rendimiento.

Método: este estudio utilizó un enfoque cuantitativo con un diseño transversal. La muestra de este estudio fue de 104 encuestados seleccionados mediante una técnica de muestreo probabilístico. La carga de trabajo física se midió mediante el %CVL (carga cardiovascular), la carga de trabajo mental NASA-TLX, el turno de trabajo, el conflicto de doble rol, el estrés laboral y el rendimiento, utilizando un cuestionario. El análisis de los datos se realizó mediante un análisis de trayectoria basado en AMOS.

Resultados: según el análisis con un nivel de confianza del 95 % (CI = 0,05), el rendimiento de las enfermeras se vio significativamente afectado por la carga de trabajo física (p = 0,000), la carga de trabajo mental (p = 0,007), el turno de trabajo (p = 0,031) y el estrés laboral (p = 0,000), mientras que el estrés laboral estaba mediado principalmente por la carga de trabajo mental (p = 0,015); efecto indirecto = -0,022) y el conflicto de doble rol (p = 0,000; efecto indirecto = -0,042), mientras que la carga de trabajo física (p = 0,112; efecto

indirecto = -0,111) y los turnos de trabajo ($p = 0,075$; efecto indirecto = -0,064) no tuvieron un efecto significativo sobre el estrés ni, indirectamente, sobre el rendimiento.

Conclusiones: el rendimiento de las enfermeras se ve influido directamente por la carga de trabajo, los turnos de trabajo y el estrés laboral, e indirectamente por la carga de trabajo mental y el conflicto de doble rol.

Palabras clave: Carga de Trabajo; Carga de Trabajo Física; Carga de Trabajo Mental; Turnos; Estrés Laboral; Rendimiento de las Enfermeras; Conflicto de Doble Rol.

INTRODUCTION

According to WHO and the Indonesian Ministry of Health, hospitals are health care institutions that also function as education and research centers, with the JCI report (2015-2020) recording the number of nurses reaching 4 916 614 people (85,8 %) in the USA and 2,134,156 people (64,5 %) in Australia, which has met the needs of their respective countries.⁽¹⁾ In Indonesia, the number of nurses in hospitals reached 219 264 people (45,65 % of the total health workforce), with a national ratio of 87,65 per 100 000 people from the target of 180 per 100 000 people, so that the shortage of personnel can cause excessive workload; nurses themselves are the dominant human resources (55,65 %) who provide 24-hour services and their performance is determined by efforts, abilities, and responsibilities according to the definition of performance.⁽²⁾ WHO survey data reported that nursing workers in the United States found a percentage of 46 % of nurses felt stressed about their work and as many as 34 % of nurses thought about quitting their jobs due to the stress they experienced.⁽³⁾ Work stress is a global problem with 385 000 cases in the UK and 11 000-26 000 cases in Wales, even according to ANAOH nurses rank in the top 40 cases of work stress and are at risk of minor psychiatric disorders and depression; in Indonesia, 50,9 % of nurses reported experiencing stress due to high workload and inadequate income, while research at Labuan Hospital Baji confirmed that work stress is directly related to decreased nurse performance.⁽⁴⁾

The results of the study Ilham et al.⁽⁵⁾ of 53,2 % of work stress occurs in employees who have a positive and significant effect on performance, this means that the greater the level of work stress, it can affect the level of employee performance. According to Saulina et al.⁽⁶⁾ in addition to physical workload, workload can also be assessed from mental strain. According to Luh et al.⁽⁷⁾ mental workload is a series of activities that require mental processes or skills that must be completed over a period of time. Yuan et al.⁽⁸⁾ of 31 nurses showed that the average score of nurses' mental workload was 65,24, with 54 % of nurses experiencing high mental workload. In research Runtu et al.⁽⁹⁾ stated that excessive workload will cause mental stress or emotional reactions such as headaches, indigestion and irritability. In achieving performance can also occur due to the pressures faced. The pressure is a form of workload, so the more load received, the more potential work stress is experienced. Based on research Rhamdani et al.⁽¹⁰⁾ found that work shifts are related to work stress in nurses. As many as 82 % of nurses who work shifts experience work stress. The nurses at Asy- Syifa West Sumbawa Hospital who undergo this work shift experience an irregular lifestyle compared to those who do not work shifts. Eating with family and sleeping well, especially during fast or slow shifts. The existence of work shifts that cannot be managed properly will affect employee performance, one of which is work stress.⁽¹¹⁾

In addition to workload factors, work shifts, dual role conflict is one of the factors that can affect employee performance levels. Dual role conflict is a form of pressure from work and family related to the incidence of work stress. Dual role conflict or in other terms Work-Family Conflict in working women, is strongly associated with depression because it is related to responsibilities in work, managing households and raising children.⁽¹²⁾ A study in America showed that 65 % of career women who experience work stress are caused by dual role conflict and reduce work productivity. Women who play the role of wife and mother as well as workers usually cause dual role conflict (work-family conflict). This condition is related to their main role as mothers and wives, but they still have other roles outside the home, namely career women, so the main focus of dual role conflict is on women.⁽¹³⁾ According to respondents, the factor that most affects patient work stress is the freedom given at work (64 %). Based on the results of multiple linear regression test, there is a significant relationship between work stress and nurse performance.

RSUD Daya Makassar as the only hospital owned by the Makassar City Government still focuses on output indicators (LOS, BOR, GDR, BTO, TOI) without paying attention to input and process factors that affect nurse work effectiveness and patient satisfaction. This results in the performance of nurses at Daya Hospital Makassar City is still far from efficiency.⁽¹⁴⁾ Observations at Makassar Daya Hospital showed that 80 % of nurses are married women who work in a 3-shift system (morning, afternoon, night), where long night working hours and dual role conflict between work and family demands have the potential to cause work stress, so it is necessary to study the effect of workload, work shifts, dual role conflict, and work stress on the performance of female nurses.

METHOD

This study used an analytical observational design with a cross-sectional approach, conducted at Makassar City Hospital from April to May 2025. The study involved 140 married female nurses as the population, with 104 respondents selected using the Slovin formula and the Proportionate Stratified Random Sampling technique to ensure proportional representation of each department. The inclusion criteria were married female nurses working permanently and actively during the research period and willing to participate by signing informed consent. Exclusion criteria included nurses who were on leave, ill, or did not complete the questionnaire, while exit criteria applied to respondents who withdrew before completing data collection. The study examined variables including mental workload (NASA-TLX), physical workload (pulse oximeter), dual role conflict, work shift patterns, work stress (DASS-21), and nurse performance. The instruments were tested for validity ($r > 0,361$) and reliability (Cronbach's Alpha $> 0,60$), with validation performed by the researchers through expert consultation and pilot testing. Data were collected through questionnaires and direct physiological measurements for primary data, as well as hospital records and related literature for secondary data. The collection process was conducted during working hours under researcher supervision to ensure completeness and confidentiality. Data were processed using AMOS software through stages of editing, coding, entry, cleaning, and tabulation. Analyses included univariate, bivariate (Chi-square test), and multivariate (path analysis) to assess direct and indirect effects of workload, work shift, dual role conflict, and work stress on nurse performance. This research obtained ethical approval from the Research Ethics Committee of Hasanuddin University, with Ethical Clearance Number: 926/UN4.14.1/TP.01.02/2025. All participants provided written informed consent, and confidentiality was maintained throughout the study.

RESULTS

RSUD Daya Makassar is a class B public hospital owned by the Makassar City Government located on Jl. Perintis Kemerdekaan KM.14, developed from Daya Care Health Center (1975) to become a type B hospital in 2012, as well as a referral center in the northern region of Makassar and winner of the best service in Indonesia in 2018. Based on Mayor Decree No. 5/2007 and Perwali No. 54/2009, the hospital has complete facilities such as VVIP-Class III treatment room, ICU, HCU, NICU, PICU, isolation room, laboratory, radiology, CT-Scan, and 24-hour emergency room with various specialty services. RSUD Daya has also achieved full accreditation (five-star) from KARS, now has main accreditation status (four-star), and is being improved through renovation programs including interior design, air circulation, ambulance access, and patient room comfort.

Table 1. Distribution of Respondents' Characteristics and Research Variables

Variables	Category	Frequency (n)	Percentage (%)
Age	Young	67	64,4
	Older	37	35,6
Working Period	< 5 years	38	36,5
	> 5 years	66	63,5
Work Unit	Most: Child Care	14	13,5
	Least: Pulmonary & VIP 5th Floor	7	6,7
Physical Workload	Heavy	58	55,8
	Light	46	44,2
Mental Workload	Heavy	40	38,5
	Medium	26	25,0
	Mild	38	36,5
Work Shift	Morning	42	40,4
	Afternoon	30	28,8
	Evening	32	30,8
Dual Role Conflict	High	41	39,4
	Medium	28	26,9
	Low	35	33,7
Work stress	High	35	33,7
	Medium	29	27,9
	Low	40	38,5
Nurse Performance	Less	44	42,3
	Good	60	57,7

The majority of respondents in this study were young female nurses (64,4 %) with more than 5 years of service (63,5 %). Most work units were from the pediatric ward (13,5 %), while the fewest were from the pulmonary ward and 5th floor VIP (6,7 %). More than half of the nurses experienced heavy physical workload (55,8 %) and heavy mental workload (38,5 %), while the distribution of work shifts was relatively balanced with a dominance in the morning shift (40,4 %). Most dual role conflicts were in the high category (39,4 %), in line with the high proportion of work stress (33,7 % high). Despite this, most nurses still showed good performance (57,7 %), although quite a number were also classified as underperforming (42,3 %), reflecting the significant influence of workload factors, role conflict, and stress on nurse performance in Makassar City Hospital.

Table 2. Cross tabulation of physical workload on performance of female nurses in Makassar City Hospital in 2025

Workload Physical	Nurse Performance				Total		p-Value
	Less		Good		N	%	
	n	%	n	%			
Weight	36	62,1	22	37,9	58	100	0,000
Mild	8	17,4	38	82,6	46	100	
Total	44	42,3	60	57,7	104	100	

Of the 104 respondents, 44 people (42,3 %) had poor performance with the majority of heavy physical workload (36 people; 62,1 %), while 60 people (57,7 %) with good performance had more light physical workload (38 people; 82,6 %). Chi-Square test results showed p-value = 0,000 < 0,05, which means there is a significant influence between physical workload and performance of female nurses at Makassar City Hospital in 2025.

Table 3. Cross Tabulation of Mental Workload on Performance of Female Nurses in Makassar City Hospital Year 2025

Workload Mental	Nurse Performance				Total		p-Value
	Less		Good		N	%	
	n	%	n	%			
Weight	26	65,0	14	35,0	40	100	0,000
Medium	12	46,2	14	53,8	26	100	
Lightweight	6	15,8	32	84,2	38	100	
Total	44	42,3	60	57,7	104	100	

Of the 104 respondents, 44 people (42,3 %) had poor performance with the majority of heavy mental workload (26 people; 65,0 %) while 60 people (57,7 %) with good performance were dominated by light mental workload (32 people; 84,2 %). Chi-Square test results showed p-value = 0,000 < 0,05, which means there is a significant influence between mental workload and performance of female nurses at Makassar City Hospital in 2025.

Table 4. Cross Tabulation of Work Shift on Performance of Female Nurses in Makassar City Hospital Year 2025

Work Shift	Nurse Performance				Total		p-Value
	Less		Good		N	%	
	n	%	n	%			
Morning Shift	23	54,8	19	45,2	40	100	0,097
Afternoon Shift	11	36,7	19	63,3	26	100	
Night Shift	10	31,3	22	68,8	38	100	
Total	44	42,3	60	57,7	104	100	

Of the 104 respondents, 44 people (42,3 %) had poor performance with the majority in the morning shift (23 people; 54,8 %), while 60 people (57,7 %) with good performance were more in the night shift (22 people; 68,8 %) and afternoon (19 people; 63,3 %). However, the results of the Chi-Square test showed a p-value = 0,097 > 0,05, so there was no significant influence between work shifts and the performance of female nurses at Makassar City Hospital in 2025.

Table 5. Cross Tabulation of Dual Role Conflict on Performance of Female Nurses in Makassar City Hospital Year 2025

Dual Role Conflict	Nurse Performance				Total		p-Value
	Less		Good		N	%	
	n	%	n	%			
High	30	73,2	11	26,8	41	100	0,000
Medium	8	28,6	20	71,4	28	100	
Low	6	17,1	29	82,9	35	100	
Total	44	42,3	60	57,7	104	100	

Of the 104 respondents, 44 people (42,3 %) with poor performance were dominated by high dual role conflict (30 people; 73,2 %) while 60 people (57,7 %) with good performance mostly had low dual role conflict (29 people; 82,9 %). Chi-Square test showed p-value = 0,000 <0,05, which means there is a significant influence between dual role conflict and performance of female nurses in Makassar City Hospital in 2025.

Table 6. Cross Tabulation of Physical Workload and Work stress of Female Nurses in Makassar City Hospital Year 2025

Workload Physical	Work stress						Total		p-Value
	High		Medium		Mild		N	%	
	n	%	n	%	n	%			
Weight	26	44,8	17	29,3	15	25,9	58	100	0,006
Mild	9	19,6	12	26,1	25	54,3	46	100	
Total	35	33,7	29	27,9	40	38,5	104	100	

Of 104 respondents, there were 35 people (33,7 %) with high work stress (26 people/44,8 % heavy physical workload), 29 people (27,9 %) with moderate stress (17 people/29,3 % heavy physical workload), and 40 people (38,5 %) with mild stress (25 people/54,3 % light physical workload). Chi-Square test showed p-value = 0,006 <0,05 which means there is a significant influence between physical workload and work stress in female nurses at Makassar City Hospital in 2025.

Table 7. Cross Tabulation of Mental Workload and Work stress of Female Nurses in Makassar City Hospital Year 2025

Workload Mental	Work stress						Total		p-Value
	High		Medium		Low		N	%	
	n	%	n	%	n	%			
Weight	22	55,0	9	22,5	9	22,5	40	100	0,002
Medium	5	19,2	11	42,3	10	38,5	26	100	
Lightweight	8	21,1	9	23,7	21	55,3	38	100	
Total	35	33,7	29	27,9	40	38,5	104	100	

Of the 104 respondents, there were 35 people (33,7 %) with high work stress who mostly had heavy mental workload (22 people; 55,0 %) 29 people (27,9 %) with moderate stress dominated by moderate mental workload (11 people; 42,3 %) and 40 people (38,5 %) with mild stress mostly had mild mental workload (21 people; 55,3 %). Chi-Square test shows p-value = 0,002 <0,05 so there is a significant influence between mental workload and work stress in female nurses at Makassar City Hospital in 2025.

Of the 104 respondents, there were 35 people (33,7 %) with high work stress almost evenly distributed in the morning shift (14 people; 33,3 %) afternoon (10 people; 33,3 %) and night (11 people; 34,4 %), 29 people (27,9 %) with moderate stress more in the morning shift (13 people; 31,0 %) and 40 people (38,5 %) with low stress dominant in the afternoon shift (13 people; 43,3 %). The results of the Chi-Square test showed a p-value = 0,958 > 0,05 so there was no significant influence between work shifts and work stress in female nurses at Makassar City Hospital in 2025.

Table 8. Cross Tabulation of Work Shift on Work stress of Female Nurses in Makassar City Hospital Year 2025

Shift Work	Work stress						Total	p-Value	
	High		Medium		Low				
	n	%	n	%	n	%	N	%	
Morning Shift	14	33,3	13	31,0	15	35,7	42	100	0,958
Afternoon Shift	10	33,3	7	23,3	13	43,3	30	100	
Night Shift	11	34,4	9	28,1	12	37,5	32	100	
Total	35	33,7	29	27,9	40	38,5	104	100	

Table 9. Cross Tabulation of Dual Role Conflict and Work stress of Female Nurses in Makassar City Hospital Year 2025

Conflict Dual Role	Work stress						Total	p-Value	
	High		Medium		Low				
	n	%	n	%	n	%	N	%	
High	24	58,5	10	24,4	7	17,1	41	100	0,000
Medium	8	28,6	10	35,7	10	35,7	28	100	
Low	3	8,6	9	25,7	23	65,7	35	100	
Total	35	33,7	29	27,9	40	38,5	104	100	

Of the 104 respondents, 35 people (33,7 %) with high work stress predominantly have high dual role conflict (24 people; 58,5 %) 29 people (27,9 %) with moderate stress are balanced between high and moderate dual role conflict (10 people each; 24,4 % and 35,7 %), while 40 people (38,5 %) with low stress are predominantly low dual role conflict (23 people; 65,7 %). Chi-Square test shows p-value = 0,000 <0,05 so there is a significant influence between dual role conflict and work stress in female nurses at Makassar City Hospital in 2025.

Table 10. Cross tabulation of work stress on the performance of female nurses in Makassar City Hospital Year 2025

Work stress	Nurse Performance				Total	p-Value	
	Less		Good				
	n	%	n	%	N	%	
High	24	68,6	11	31,4	35	100	0,000
Medium	17	58,6	12	41,4	29	100	
Low	3	7,5	37	92,5	40	100	
Total	44	42,3	60	57,7	104	100	

Table 11. Parameter and Hypothesis Testing of Direct Effect

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		0129
Normal Parameters ^{a,b}	Mean	0,0000000
	Std. Deviation	16,09878238
Most Extreme Differences	Absolute	0,075
	Positive	0,075
	Negative	-0,035
Kolmogorov-Smirnov Z		0,856
Asymp. Sig. (2-tailed)		0,456

a. Test distribution is Normal.

Of the 104 respondents, 44 people (42,3 %) with poor performance predominantly had high (24 people; 68,6 %) and moderate (17 people; 58,6 %) work stress while 60 people (57,7 %) with good performance were

dominated by low work stress (37 people; 92,5 %). Chi-Square test showed p-value = 0,000 <0,05 which means there is a significant influence between work stress and performance of female nurses in Makassar City Hospital in 2025.

Based on the output shown in the one-sample kolmogorov-smirnov test table 11, the Asymp. Sig. (2-tailed) value of 0,456. This value is greater than the specified significance level, which is 0,05, so it can be concluded that the residual data is normally distributed. Thus, the normality assumption in regression has been met and can be used for further testing.

Table 12. Results of Direct Effect Hypothesis Analysis

Research Variable	Estimate	S.E	C.R	p-Value
Physical Workload → Work stress	0,243	0,153	1,588	0,112
Mental Workload → Work stress	0,212	0,087	2,431	0,015*
Work Shift → Work stress	0,077	0,086	0,887	0,375
Dual Role Conflict → Work stress	0,375	0,093	4,017	0,000*
Physical Workload → Nurse Performance	-0,291	0,078	-3,732	0,000*
Mental Workload → Nurse Performance	-0,121	0,045	-2,674	0,007*
Work Shift → Nurse Performance	0,094	0,044	2,155	0,031*
Dual Role Conflict → Nurse Performance	-0,083	0,051	-1,650	0,099
Work stress → Nurse Performance	-0,171	0,050	-3,448	0,000*

*p-Value < 0,05: There is a significant effect

Based on the results of testing the direct effect hypothesis table 12, it was found that physical workload (p = 0,112; est = 0,243) and work shift (p = 0,375; est = 0,077) had no significant effect on work stress, while mental workload (p = 0,015; est = 0,212) and dual role conflict (p = 0,000; est = 0,375) had a significant effect in increasing work stress. On nurse performance, physical workload (p = 0,000; est = -0,291) mental workload (p = 0,007; est = -0,121), and work stress (p = 0,000; est = -0,171) were shown to significantly reduce performance, while work shifts (p = 0,031; est = 0,094) actually significantly improved performance, and dual role conflict (p = 0,099; est = -0,083) had no significant effect although it tended to reduce performance.

Table 13. Hypothesis Testing of Indirect Effect with Sobel Test

Hypothesis	T Statistics
Physical Workload → Work stress → Nurse Performance	-0,111
Mental Workload → Work stress → Nurse Performance	-0,022
Work Shift → Work stress → Nurse Performance	-0,064
Dual Role Conflict → Work stress → Nurse Performance	-0,042

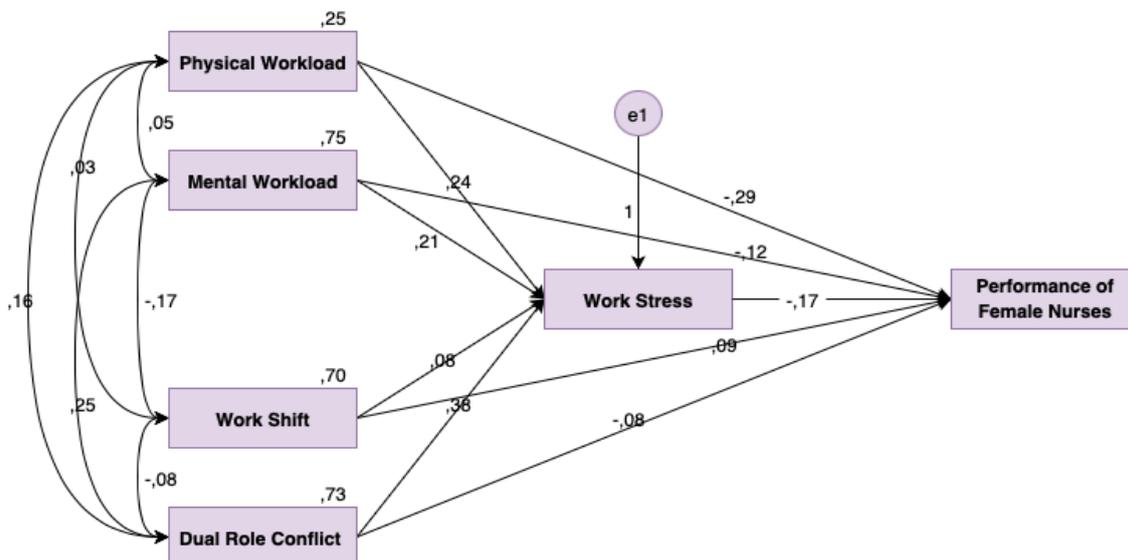


Figure 1. Final Results of Path Model

Based on table 13, all indirect effects through work stress are negative—indicating that increased stress tends to decrease nurses' performance—but only two are significant: mental workload on performance via work stress of $-0,022$ (significant) and dual role conflict on performance via work stress of $-0,042$ (significant). The other two paths are not significant, namely physical workload $-0,111$ (not significant) and work shifts $-0,064$ (not significant), so that the negative mediation of work stress in both relationships cannot be statistically confirmed. Thus, these findings confirm that managing the mental aspects of work and dual role conflict is more crucial for reducing work stress and maintaining performance, while the indirect effects of physical workload and shift patterns have not yet shown strong evidence. Final results of path model of this research shown on figure 1.

DISCUSSION

Effect of Physical Workload on Performance

The results of this study show a significant effect between physical workload and nurse performance, indicating that when physical workload increases, nurse performance tends to decline. This finding is consistent with Cesilia et al.⁽¹⁾ who reported that excessive workload leads to fatigue, which in turn reduces the quality of performance. Similarly, Ilyasa et al.⁽¹⁵⁾ demonstrated that workload has a negative partial effect on the performance of medical personnel. The consistency of these findings suggests that physical workload—derived from repetitive tasks such as patient lifting, equipment setup, and prolonged standing—creates physiological strain that diminishes focus and precision in clinical work. Poor ergonomic conditions and inefficient spatial layouts further exacerbate this issue, echoing Mugniyah et al.⁽¹⁶⁾ who emphasized the link between physical work environment and stress levels among healthcare workers. This study implies that effective workload management—through ergonomic workspace design, staffing balance, and rest rotation—can improve nurse performance and reduce error rates. Without proper workload control, nurse fatigue may compromise patient safety and hospital service quality.

The Effect of Mental Workload on Performance

The results reveal that mental workload positively affects nurse performance. This aligns with Erwanto et al.⁽¹⁷⁾ who found that nurses with moderate mental workload exhibit better performance than those with lighter workloads. A certain level of mental challenge may enhance focus and motivation, reflecting an optimal arousal model, where moderate cognitive demands stimulate higher productivity. However, excessive mental workload can shift from productive engagement to cognitive overload, leading to burnout and reduced efficiency. This duality underscores the need for hospital management to balance task complexity and cognitive demands, providing adequate support and feedback mechanisms. From a managerial perspective, optimizing mental workload through job rotation and task distribution could sustain high performance while preventing burnout. This finding also supports Ismah et al.⁽¹⁸⁾, who noted that work engagement significantly influences job satisfaction, which in turn sustains consistent work quality.

Effect of Work Shift on Performance

Work shifts were found to significantly influence nurse performance with an estimated effect of $0,094$. The morning, afternoon, and night shifts yield different performance outcomes, with afternoon and evening shifts showing relatively higher performance levels. This finding contrasts with research⁽¹⁹⁾ at Dr. Saiful Anwar Hospital, which reported that morning shifts produce the best performance due to better rest and circadian alignment. The difference may be explained by contextual factors such as organizational scheduling, nurse adaptation to shift cycles, and support systems during off-peak hours. High workload and circadian rhythm disruption at night can cause physical fatigue, slower reaction times, and lower decision accuracy.⁽²⁰⁾ Therefore, while shift variation can offer flexibility, improper scheduling can reduce nurse alertness and performance quality. The implication is that hospitals should implement strategic shift rotations and ensure equitable workload distribution across all shifts, as also recommended by Khairunnysa et al.⁽²¹⁾, who highlighted that fair scheduling systems improve employee motivation and performance.

Effect of Dual Role Conflict on Performance

Based on the results of the study, dual role conflict shows that there is no significant effect on nurse performance with an estimated effect value of $0,083$. This means that the dual role conflict that occurs in female nurses who have to work while being housewives, only provides a very small increase in nurse performance. The results of this study are in line with the findings of⁽²²⁾ on nurses at Wonosari Hospital that there is no significant influence between dual role conflict on nurse performance. This shows that the greater the dual role conflict faced, the more nurses' performance will decrease. Dual role conflict can also be caused by a night shift schedule that requires female nurses to work from night to morning and results in the nurse having to leave her family to carry out her duties and responsibilities as a nurse.

Effect of Physical Workload on Work stress

The results of this study indicate that physical workload does not have a significant effect on work stress with an estimated value of 0,243. This means that if the physical workload has increased by one point, then work stress will tend to increase by 0, 243 points even though it does not have a significant effect. This research is in line with ⁽²³⁾ on the effect of physical workload has a chi-square test result, namely a p-value of 0,351 > 0,05, which means that there is no significant influence and has a negative effect on work stress. Work stress in nurses can occur if the nurse performs his duties beyond his ability so that the nurse is unable to complete his duties. Nurses' work stress includes aspects of the work environment regarding the density of the emergency room. Physiological adaptation, effective coping strategies, and social support in the workplace can reduce the negative effects of physical workload on stress.⁽²⁴⁾ However, as Rombedatu et al.⁽²⁵⁾ emphasized, sustained fatigue accumulates over time, leading to chronic exhaustion if recovery is insufficient. Thus, although physical workload may not directly cause stress, inadequate rest or staffing shortages can convert physical strain into psychological pressure.

Effect of Mental Workload on Work stress

The results of this study indicate a significant influence between mental workload on work stress. This research is in line with ⁽²⁶⁾ based on the results of research on nurses in the *baji dakk* and *baji kamase* rooms of Labuang Baji Hospital which explains the mental workload that occurs in nurses can cause work stress in nurses, between mental workload and work stress. Factors that influence mental workload in nurses are the ever-changing conditions of patients, the average number of hours of care needed to provide direct services to patients exceeds one's ability, the desire for work achievement, high job demands and documentation of nursing care. The negative impact of increasing workload is the possibility of nurses' emotions that are not in accordance with patient expectations. This excessive workload greatly affects the productivity of health workers and of course affects the work stress of nurses.⁽²⁷⁾

Effect of Work Shift on Work stress

The results of this study indicate that work shifts do not have a significant effect on work stress with an estimated effect of 0,077. Research conducted on health workers in Medellín, Colombia found that there was no significant relationship between work shifts and work stress, even after controlling for variables such as gender, sleep duration, length of work per shift, education, and smoking habits.⁽²⁸⁾ Working the night shift can affect the body's physiological response, as humans are naturally more active during the day when circadian rhythms are at their peak and rest at night when circadian rhythms decline.⁽²⁹⁾ This condition will be reversed when a person has to work at night and sleep during the day, thus disrupting the biological balance. In addition, working night shifts can also cause problems in social and family life, because the time that should be used to interact is instead used to rest. Lack of sleep or rest leads to reduced concentration, difficulty in making decisions, and low participation in daily activities. This situation can increase psychological pressure which in turn triggers the emergence of work stress.

Effect of Dual Role Conflict on Work stress

The results of this study indicate that dual role conflict has a significant effect on work stress. This means that dual role conflict for female nurses has a positive effect on increasing work stress. In nurses, whose jobs often involve high-pressure and high-stakes decisions, the loss of this support can make them more vulnerable to the negative effects of stress.⁽³⁰⁾ This finding is in line with⁽³¹⁾ at RSUD dr. Soedarso Pontianak in female nurses stated the influence of dual role conflict (family work conflict) on work stress. According to ⁽³²⁾ stated that the work of nurses is very heavy, especially female nurses. This is because the role that women have to live is not only taking care of the family but also taking care of work. So that female nurses who do not have children, the division of roles is not too much because they only focus on husbands and work. This condition can make nurses feel pressured, this is what can trigger work stress in nurses. Dual role conflict, which is the pressure faced when work demands and family responsibilities collide, often triggers significant work stress. Research by ⁽³³⁾ found that female nurses who experienced dual role conflict reported higher work stress, illustrating how pressure is more common when dividing time between work and family puts real emotional pressure. This emphasizes that when work matters interfere with family life, individuals often feel compelled to reduce work time to provide more time for the family and vice versa, conflicts from family to work also generate considerable work stress.

Effect of Work stress on Performance

The results of this study indicate that it has a significant direct effect on nurse performance. This means that the level of work stress felt by nurses provides a positive increase in nurse performance. This finding is in line with the research at the Hajjah Andi Depu Polewali Mandar Regional General Hospital in the inpatient section states that there is a significant influence between work stress on nurse performance with a p-value of 0,000

< (0,05).⁽³⁴⁾ Work stress is a condition that involves emotions, thoughts, and physical and will affect a nurse in carrying out his work. Work stress is a condition that involves emotions, thought processes, and physical and will affect a nurse in carrying out his job. As a result of excessive stress can threaten his ability to carry out his duties.⁽³⁵⁾ Things that can be done to improve the performance of nurses at the Makassar City Hospital, can be done by paying attention to the work environment where nurses are, so that they can carry out their duties and then minimize the work stress felt by nurses, so that the performance of nurses can increase and provide maximum service to pasien and increase service satisfaction to patients. Work stress that occurs in nurses can be caused by a work environment that can mediate the relationship between work environment and performance.

Effect of Physical Workload on Performance through Work stress

The workload of nurses in hospitals includes physical and mental workloads. Physical workloads such as lifting patients, installing IVs, observing vital signs, installing oxygen, and others. Physical work activities that exceed the capacity of a nurse can reduce their performance at work so that things that should be done to maintain patient safety are often done but not in accordance with applicable procedures.⁽³⁶⁾ Based on the results of the analysis showing the indirect effects of physical workload on performance through work stress has a t-statistic value of -0,111 which can be concluded that the value is not significant. This indicates that physical workload has no indirect effect on nurse performance through work stress. The negative value only illustrates the opposite direction of the relationship, namely the more physical workload received by nurses, the stress level tends to increase which has the potential to reduce nurse performance. This study shows that work stress does not act as a mediator that explains the relationship between physical workload and nurse performance.

The Effect of Mental Workload on Performance Through Work stress

In a busy work environment, a mental workload is one of the factors often identified as the main cause of work stress experienced by many nurses. The study examines how mental workload can affect nurse performance with work stress as a mediating variable. By using a questionnaire to measure nurse performance, this study provides a deeper insight into the level of nurse performance. Based on the results of the Indirect effects analysis, the effect of mental workload through work stress on nurse performance is -0,022. This research in the inpatient room of Dr. Tjitrowardojo Purworejo Hospital which states that work stress has a positive effect on nurse performance, the workload variable felt by inpatient room nurses at Dr. Tjitrowardojo Purworejo Hospital is higher in influencing nurse performance compared to other variables.⁽³⁷⁾

Effect of Work Shift on Performance Through Work stress

Hospitals as health service providers are obliged to provide quality and affordable services to improve the degree of public health, as mandated in Law No. 44 of 2009. In line with these regulations, hospitals operate for 24 hours in certain units, including emergency installations, inpatient care, and intensive care units. Nurses as health workers in hospitals carry out tasks with a shift work system. Generally, the division of nurse shifts in Indonesia consists of three, namely the morning shift for 8 hours (07,00-14,00 WIB), the afternoon shift for 7 hours (14,00-21,00 WIB), and the night shift for 10 hours (21,00-07,00 WIB). This shows that work shifts have no indirect effect on nurse performance through work stress. The negative value only illustrates the opposite direction of the relationship, that is, the more night shift work, the stress level tends to increase, which has the potential to reduce nurse performance. This is influenced by longer work duration, which is for 10 hours, disruption of sleep patterns, physical and mental fatigue, and work pressure that remains high at night. The stress experienced by nurses on the night shift significantly impacts their performance, which is characterized by decreased focus, work motivation, and increased risk of errors in nursing actions.

The Effect of Dual Role Conflict on Performance Through Work stress

Dual role conflict, known as Work-Family Conflict (WFC), is a condition in which individuals face pressure from work demands and family demands simultaneously. In nurses who also act as housewives, WFC arises due to the complex interaction between professional and domestic responsibilities. This condition can trigger additional stress, reduce life satisfaction and affect performance at work. Female nurses are the majority affected by dual role conflict due to their heavy duties and responsibility for patient safety. Various characters of nurses are created by different parts of the job, such as shift schedules, strict discipline, competition between nurses. Dual role conflict undermines performance. However, support from teamwork can minimize conflict and maximize performance. Female nurses affected by dual role conflict can cause fatigue, bad mood at work, and others. Dual role conflict occurs due to work and family pressures. If married employees cannot carry out the role between family and work, it will have an impact on the process of carrying out their work which is less productive, cannot function normally and becomes unbalanced.

Limitations

This study has several limitations that need to be acknowledged to provide a balanced interpretation of the findings. The use of a cross-sectional design means that the observed relationships are associative rather than causal, making it difficult to determine whether the variables studied truly influence one another over time. Moreover, reliance on self-reported questionnaires may have introduced a degree of response bias, as participants could underreport or overstate their experiences of workload, stress, or performance due to social desirability or personal perceptions. The measurement of complex constructs such as mental workload and stress through subjective responses may therefore not fully capture their multidimensional nature.

Another limitation lies in the study's setting and sampling procedure. Conducting the research in a single hospital context restricts the generalizability of the results to other institutions with different management systems, patient loads, and work environments. In addition, the use of the Slovin formula to determine sample size may not fully represent the population's variability, potentially influencing the accuracy of statistical estimations. To enhance the robustness of future studies, it is recommended to employ longitudinal or mixed-method designs that can track changes over time, incorporate qualitative insights, and include objective indicators such as physiological stress markers or performance audits. Broader multi-center research would also strengthen external validity and contribute to a deeper understanding of how workload, stress, and performance interact within diverse healthcare settings.

CONCLUSIONS

Based on the results of research on the Effect of Workload, Work Shifts, and Dual Role Conflict on Performance through Work stress in Female Nurses at Makassar City Hospital in 2025, it can be concluded that physical workload has a direct effect on performance but not through work stress, mental workload has an effect both directly and through work stress, work shifts have a direct effect on performance but not through work stress, while dual role conflict has no direct effect but an effect through work stress. From these findings, it is recommended for hospitals to evaluate workload, provide stress management programs, and implement supportive work shift policies; for nurses to manage workload, prepare for shifts, and develop strategies to deal with dual role conflict; and for future researchers to add other variables such as social support and job satisfaction, expand research methods and populations, and test other mediation models such as coping mechanisms or other psychological factors.

BIBLIOGRAPHIC REFERENCES

1. Cesilia R, Kosasih. Pengaruh Beban Kerja Dan Kelelahan Kerja Terhadap Kinerja Perawat. *J Sos Teknol*. 2024 Oct;4(10):909-22.
2. Latunusa PM, Timuneno T, Fanggidae RE. The Effect Of Multiple Role Conflict And Work Stress On The Performance Of Women Nurses During The Covid-19 With Coping Stress As Intervening Variables (Study At Soe Regional General Hospital). *J Multidiscip Acad Pract Stud*. 2023;1(1):53-67.
3. Maydinar DD, Sasmita FN, Selandio V. Hubungan Stres Kerja Dengan Kinerja Perawat Di Ruang Rawat Inap Melati Dan Seruni Rsud Dr. M. Yunus Bengkulu. *PREPOTIF J Kesehat Masy*. 2020;4(2):169-75.
4. Ismail, Haskas Y, Sabil FA. Hubungan Stres Kerja Dengan Kinerja Perawat Dalam Melaksanakan Asuhan Keperawatan Di Ruang Rawat Inap RSUD Labuang Baji Makassar. *J Ilm Mhs Penelit Keperawatan*. 2023;3(2):30-6.
5. Ilham NR, Prasetyo AP. Pengaruh Stres Kerja Terhadap Kinerja Karyawan. *J Penelit IPTEKS*. 2022 Jul;7(2):96-104.
6. Saulina Batubara G, Abadi F. Pengaruh Beban Kerja Dan Dukungan Rekan Kerja Terhadap Kinerja Karyawan Dengan Stres Kerja Sebagai Variabel Intervening. *Sibatik J J Ilm Bid Sos Ekon Budaya, Teknol Dan Pendidik*. 2022;1(11):2483-96.
7. Luh N, Riani T, Putra MS. Pengaruh Stres Kerja, Beban Kerja Dan Lingkungan Kerja Non Fisik Terhadap Turnover Intention Karyawan. *E-Jurnal Manaj Univ Udayana*. 2017;6(11):255226.
8. Yuan Z, Wang J, Feng F, Jin M, Xie W, He H, Et Al. The Levels And Related Factors Of Mental Workload Among Nurses: A Systematic Review And Meta-Analysis. *Int J Nurs Pract*. 2023 Oct;29(5).
9. Runtu V V, R H, L P. Hubungan Beban Kerja Fisik Dengan Stres Kerja Perawat Diruang Instalasi Rawat Inap Rumah Sakit Umum Gmim Pancaran Kasih Manado. *J Keperawatan*. 2018;6(1):1-7.

10. Rhamdani, Indah Wartono M. Hubungan Antara Shift Kerja, Kelelahan Kerja Dengan Stres Kerja Pada Perawat. *J Biomedika Dan Kesehat.* 2019;2(3):104-10.
11. Pradina TM, Febriyanto K. Hubungan Antara Shift Kerja Dengan Stres Kerja Pada Petugas Lembaga Pemasyarakatan. *Borneo Student Res.* 2022;3(2):1884-9.
12. Wahab A, Yasrie A, Anwar M. Pengaruh Konflik Peran Ganda Terhadap Kinerja Melalui Stress Kerja Sebagai Moderator Pada Pegawai Wanita (Studi Pada Dinas Pemberdayaan Perempuan, Perlindungan Anak, Pengendalian Penduduk Dan Keluarga Berencana Kabupaten Tabalong). *Jurna; Ekon Dan Bisnis.* 2019;12(2):250-66.
13. Panjaitan NAM, Siahaan PBC, Siagian M, Sianipar MR. Konflik Peran Ganda Pada Guru Wanita Dan Kaitannya Dengan Stres Kerja. *J Prima Med Sains.* 2021;3(2):41-6.
14. Basalamah FF, Ahri RA, Arman A. Pengaruh Kelelahan Kerja , Stress Kerja , Motivasi Kerja Dan Beban Kerja. *Idea Heal J.* 2021;1(02):67-80.
15. Haidar Ferdian Ilyasa, Naniek Ratni Juliardi A.R. Analisis Pengaruh Beban Kerja, Stres Kerja, Kelelahan Kerja, Dan Lingkungan Kerja Terhadap Kinerja Tenaga Medis. *INSOLOGI J Sains Dan Teknol.* 2023 Aug;2(4):791-802.
16. Mugniyah AA, Darwis AM, Wahyuni A. Relationship Between Physical And Non-Physical Work Environment With Work Stress. *Hasanuddin J Public Heal.* 2023;4(2):159-70.
17. Erwanto, Leviana B, Rahmawati N, Erlinda SAP. Hubungan Beban Kerja Dengan Kinerja perawat. *J Sci Mandalika.* 2025;6(6):1488-95.
18. Ismah A, Arifah N, Sari N. Hubungan Work Engagement Terhadap Kepuasan Kerja Pada Staf Di Rumah Sakit Stella Maris. *Hasanuddin J Public Heal.* 2024;5(1):24-32.
19. Astuti, R. D., & Wahyuni S. Hubungan Shift Kerja Dengan Kinerja Perawat Di RSUD Dr. Saiful Anwar Malang. *J Ilmu Kesehat.* 2022;10(2):112-20.
20. Russeng SS, Saleh LM, Mallongi A, Hoy C. The Relationship Among Working Period, Work Shift, And Workload To Work Fatigue In Air Traffic Controllers At Sultan Hasanuddin Airport. *Gac Sanit.* 2021;35:S404-7.
21. Khairunnysa, Balqis. Faktor yang berpengaruh terhadap kinerja pegawai di puskesmas Kota Pangkajene Kabupaten Pangkep tahun 2025. *Hasanuddin J Public Heal.* 2025;6(2):220-9.
22. Rifana NY. Pengaruh Shift Malam Dan Konflik Peran Ganda Terhadap. Vol. 313, *Jurnal Manajemen Bisnis Indonesia.* 2018. P. 417-25.
23. Sari VN, Safitri R, Sulistyowati E. Pengaruh Beban Kerja Dan Lingkungan Kerja Terhadap Kinerja Karyawan Dengan Stres Kerja Sebagai Variabel Intervening Pada PT Batanghari Barisan Padang. *J Maksipreneur Manajemen, Koperasi, Dan Entrep.* 2022;12(1):288.
24. Bakker AB, Demerouti E. The Job Demands-Resources Model: State Of The Art. *J Manag Psychol.* 2007 Apr;22(3):309-28.
25. Rombedatu AT, Saleh LM, Yusbud M. Faktor yang berhubungan dengan perasaan kelelahan kerja pada. *Hasanuddin J Public Heal.* 2025;6(1):97-109.
26. Timur RHO, Nurbaya S, Yusnaeni. Hubungan Beban Kerja Dengan Stres Perawat. *J Ilm Mhs Penelit Keperawatan.* 2023;3:1-6.
27. Wahyuningsih S, Ali Maulana M, Ligita T, Studi Keperawatan P, Kedokteran F. Faktor-Faktor Yang Memengaruhi Beban Kerja Perawat Dalam Memberikan Asuhan Keperawatan Di Ruang Rawat Inap: Literature Review. *J UNTAN.* 2021;1(1):23-35.
28. García-Herrera, R., Gómez, A., Sierra M. Shift Work, Stress, And Associated Factors Among Healthcare Workers In Medellín, Colombia. *Rev Fac Nac Salud Pública.* 2019;37(3):54-63.

29. Brum MCB, Senger MB, Schnorr CC, Ehlert LR, Da Costa Rodrigues T. Effect Of Night-Shift Work On Cortisol Circadian Rhythm And Melatonin Levels. *Sleep Sci.* 2022;15(2):143-8.
30. Barang ZPD, Wahyu A, Saleh LM, Naiem MF, Muis M, Mallongi A. The Effect Of Workload, Dual Role Conflict Working Hours, And Job Stress On The Performance Of Female Nurse At Stella Maris Hospital In 2024. 2024;27(2):509-17.
31. Rachmaningrum R, Makmuriana L. Pengaruh Konflik Peran Ganda (Family Work Conflict) Terhadap Stres Kerja Perawat Wanita Di RSUD Dr. Soedarso Pontianak. *J Keperawatan Dan Kesehat.* 2018 Oct;9(2):33-44.
32. Finarti DR, Bachri AA, Arifin S. Hubungan Gaya Kepemimpinan, Motivasi, Stres Kerja Dengan Kinerja Perawat. *J Berk Kesehat.* 2017 Apr;1(2):115.
33. Vidia T, Putri N, Qowi NH, Ubudiyah M. The Relationship Between Dual Role Conflict And Work Stress Of Female Nurses. *Fundam Manag Nurs J.* 2023 Apr;6(1):25-9.
34. Asri A, Hannan M, Nursam SW. Pengaruh Stres Kerja Terhadap Kinerja Perawat Rawat Inap Rumah Sakit Hajjah Andi Depu Polewali Mandar. *J Peqguruang Conf Ser.* 2023;5(2):888.
35. Fanka F. Pengaruh Stres Kerja Dan Beban Kerja Terhadap Prestasi Kerja Perawat Rumah Sakit Sansani Pekanbaru. Universitas Islam Riau Pekanbaru; 2021.
36. Yudi D, Tangka JW, Wowiling F. Hubungan Beban Kerja Fisik Dan Mental Perawat Dengan Penerapan Patient Safety Di IGD Dan ICU RSUD GMIM Pancaran Kasih Manado. *J Keperawatan.* 2019 Jan;7(1).
37. Larasati MA, Baraba R, Annisa NN. Peran Stres Kerja Memediasi Beban Kerjaterhadap Kinerja Perawat RSUD Dr. Tjitrowardojo Purworejo. *J Sains Dan Teknol.* 2023;5(1):142-8.

FINANCING

All research and publication costs are carried out independently without any financial assistance from other parties.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Vitra Amanda, Masyitha Muis, Lalu Muhammad Saleh.

Data curation: Vitra Amanda.

Formal analysis: Vitra Amanda.

Research: Vitra Amanda.

Methodology: Vitra Amanda, Masyitha Muis, Lalu Muhammad Saleh.

Project management: Vitra Amanda, Masyitha Muis, Lalu Muhammad Saleh.

Resources: Vitra Amanda.

Software: Vitra Amanda.

Supervision: Masyitha Muis, Lalu Muhammad Saleh.

Validation: Masyitha Muis, Lalu Muhammad Saleh.

Display: Vitra Amanda.

Drafting - original draft: Vitra Amanda.

Writing - proofreading and editing: Vitra Amanda.