

ORIGINAL

The Effect of Job Factors and Work Environment Factors on Work Productivity Through Burnout in Nurses at Bhayangkara Hospital, Makassar

El efecto de los factores laborales y del entorno de trabajo en la productividad laboral a través del agotamiento en el personal de enfermería del Hospital Bhayangkara, Makassar

Gagarin Gyardani Samani¹  , Lalu Muhammad Saleh¹ , Syamsiar S. Russeng¹ , Yahya Thamrin¹ , Apik Indarty Moedjiono² 

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

²Hasanuddin University, Department of Biostatistics. Makassar. Indonesia.

Cite as: Gyardani Samani G, Muhammad Saleh L, S. Russeng S, Thamrin Y, Indarty Moedjiono A. The Effect of Job Factors and Work Environment Factors on Work Productivity Through Burnout in Nurses at Bhayangkara Hospital, Makassar. Salud, Ciencia y Tecnología. 2025; 5:2295. <https://doi.org/10.56294/saludcyt20252295>

Submitted: 28-05-2025

Revised: 12-08-2025

Accepted: 20-10-2025

Published: 21-10-2025

Editor: Prof. Dr. William Castillo-González 

Corresponding author: Gagarin Gyardani Samani 

ABSTRACT

Introduction: the Indonesian National Nurses Association (PPNI) reports that 50,9 percent of nurses experience high levels of work stress, which can lead to burnout. Nursing is a demanding profession. This stress can lead to decreased work performance.

Method: this study used a quantitative approach with a cross-sectional design. The sample of this study was 130 respondents selected using a purposive sampling technique. Data were collected through questionnaires and direct examinations in the field. Physical workload was measured by percentCVL (Cardio Vascula Load), mental workload was measured by NASA-TLX, work shifts, lighting using a lux meter, and interpersonal conflict, work productivity, and burnout using a questionnaire. Data analysis used AMOS-based path analysis.

Results: physical and mental workload have a significant effect on burnout ($p=0,007$; $p=0,014<0,05$) but physical and mental workload do not have a significant effect on work productivity through burnout as a mediator ($p=0,067$; $p=0,061>0,05$). Work shifts do not have an effect on burnout ($p>0,05$), but the burnout mediator is significant ($p=0,017<0,05$). Lighting has a significant effect on burnout ($p=0,044<0,05$) but lighting does not have a significant effect on work productivity through burnout as a mediator ($p=0,050$). And interpersonal conflict does not have a significant effect on burnout ($p>0,05$) but the burnout mediator is significant ($p=0,008<0,05$).

Conclusions: work productivity is directly influenced by workload and work shifts and indirectly by work shifts and interpersonal conflict.

Keywords: Physical Workload; Mental Workload; Work Shift; Lighting; Interpersonal Conflict; Burnout; Work Productivity.

RESUMEN

Introducción: la Asociación Nacional de Enfermeras de Indonesia (PPNI) informa que el 50,9 percent de las enfermeras experimentan altos niveles de estrés laboral, lo que puede provocar agotamiento. La enfermería es una profesión exigente. Este estrés puede provocar una disminución del rendimiento laboral.

Método: este estudio utilizó un enfoque cuantitativo con un diseño transversal. La muestra de este estudio fue de 130 encuestados seleccionados mediante una técnica de muestreo intencional. Los datos se recopilaron mediante cuestionarios y exámenes directos sobre el terreno. La carga de trabajo física se midió mediante el

percentCVL (carga cardiovascular), la carga de trabajo mental se midió mediante el NASA-TLX, los turnos de trabajo, la iluminación mediante un luxómetro y los conflictos interpersonales, la productividad laboral y el agotamiento mediante un cuestionario. El análisis de los datos se realizó mediante un análisis de trayectoria basado en AMOS.

Resultados: la carga de trabajo física y mental tiene un efecto significativo sobre el agotamiento ($p=0,007$; $p=0,014<0,05$), pero la carga de trabajo física y mental no tiene un efecto significativo sobre la productividad laboral a través del agotamiento como mediador ($p=0,067$; $p=0,061>0,05$). Los turnos de trabajo no tienen ningún efecto sobre el agotamiento ($p>0,05$), pero el mediador del agotamiento es significativo ($p=0,017<0,05$). La iluminación tiene un efecto significativo sobre el agotamiento ($p=0,044<0,05$), pero no tiene un efecto significativo sobre la productividad laboral a través del agotamiento como mediador ($p=0,050$). Y el conflicto interpersonal no tiene un efecto significativo sobre el agotamiento ($p>0,05$), pero el mediador del agotamiento es significativo ($p=0,008<0,05$).

Conclusiones: la productividad laboral está influenciada directamente por la carga de trabajo y los turnos de trabajo e indirectamente por los turnos de trabajo y el conflicto interpersonal.

Palabras clave: Carga de Trabajo Físico; Carga de Trabajo Mental; Turno de Trabajo; Iluminación; Conflicto Interpersonal; Agotamiento; Productividad Laboral.

INTRODUCTION

Hospitals provide comprehensive health services, including inpatient, outpatient, and emergency care, but the high morbidity rate in Indonesia risks causing nurses to experience burnout which has an impact on the decline in the quality of inpatient services.⁽¹⁾ According to Law No. 47 of 2021, a hospital is a health service institution that provides comprehensive individual health services, providing inpatient, outpatient, and emergency care, based on ethics and professionalism, as well as the principles of benefit, justice, equal rights, anti-discrimination, equity, protection, patient safety, and has a social function.⁽²⁾ Nurses who work 24 hours often experience mental and emotional exhaustion due to the demands of their duties, which can lead to burnout and a decline in the quality of service.⁽³⁾

WHO predicts that psychological disorders, such as severe fatigue leading to depression, will be the second leading cause of death after heart disease in 2020, while ILO (2018) reports that 380 000 workers die each year due to accidents or occupational diseases, and 374 million suffer injuries or illnesses, with 28 percent of the workforce reporting health problems due to chronic stress.⁽⁴⁾ The National Safety Council (NSC) explains that burnout is caused by stress due to workload, with symptoms such as boredom, pessimism, decreased concentration, decreased work quality, depression, low job satisfaction, absenteeism, and health problems.⁽⁵⁾ The Indonesian National Nurses Association (PPNI) states that as many as 50,9 percent of nurses experience work stress which is quite high and can lead to burnout.⁽⁶⁾

According to Wiranti⁽³⁾ In Europe, 90 percent of burnout is experienced by health and social workers (including nurses), with nurses being the profession that experiences the most burnout, almost half of the total workers experiencing it, which is caused by long-term work stress due to emotional pressure and overloaded work demands, which leads to physical, emotional, and mental exhaustion.⁽⁷⁾ The main symptoms of burnout include emotional exhaustion, depersonalization, and decreased personal accomplishment. In addition, this also has an impact on decreasing work productivity.⁽⁸⁾ High job demands, such as tight work schedules, great responsibility, and working in teams, make the nursing profession vulnerable to burnout, which is influenced by factors such as shift rotation, workload, length of service, as well as the physical and non-physical work environment, such as lighting, noise, and interpersonal conflict. Good lighting in hospitals is very important for the comfort, safety, and health of nurses, patients, and visitors, as well as improving a comfortable working atmosphere.⁽⁹⁾

Adequate lighting in the work environment is crucial for increasing productivity, with a significant impact on concentration and reducing work errors, which can increase productivity by 10-50 percent. Exposure to bright light also helps sleep management for shift workers, such as nurses, who work non-standard hours, with night shifts considered the most challenging, and approximately 20-25 percent of jobs worldwide involve shift work, which affects worker health and safety, especially in the protective services sector.⁽¹⁰⁾ Chairany's research⁽¹¹⁾ shows that workload and work environment influence the occurrence of burnout. Workload is the demand for tasks to be completed within a certain time, which can become a burden if workers have difficulty adjusting to the task. Workload is the difference between a worker's abilities and the demands of the job, and a workload that is too high or too low can lead to overstress or burnout. Studies in the United States show that 49 percent of nurses under 30 years old and 40 percent of nurses over 30 years old experience burnout, which is influenced by high workload. Nurses' workload, which includes all activities in the nursing service unit, can affect their job satisfaction.⁽¹²⁾

Nurses' workload includes both physical and mental aspects, which can lead to occupational disorders or

illnesses if they are too heavy or exceed physical capabilities, with factors such as the number of patients, the patient's condition, and the frequency of procedures performed. Excessive workload can cause physical and mental fatigue as well as emotional symptoms such as headaches and digestive disorders, which are directly related to burnout in nurses. In addition, poor communication between nurses and other professionals often triggers conflicts that worsen the condition.⁽¹³⁾

Interpersonal conflict between employees in an organization can increase stress levels, which if not resolved, can continue and affect the individual's interaction with their tasks and coworkers, thus becoming one of the causes of work stress that leads to burnout.⁽¹⁴⁾ In research of Agastya et al.⁽¹⁵⁾ regarding the influence of interpersonal conflict and workload on work stress, it was shown that interpersonal conflict has a positive and significant effect on work stress, which can contribute to burnout. Shift work is a work schedule arrangement that includes morning, afternoon, and night shifts, which is implemented to achieve better results, especially on machines that operate 24 hours, which results in an increase in the number of shift workers. Nurses, as a profession that often uses a shift system, work outside normal working hours for a certain period of time.⁽¹⁶⁾

Initial observations conducted at Bhayangkara Hospital in Makassar City on five nurses showed that they complained of several symptoms of burnout, such as headaches, difficulty sleeping, difficulty concentrating and making decisions, and increased emotionality. Based on these complaints, they said it could interfere with their productivity while doing their work. These findings emphasize the importance of analyzing the factors causing burnout and also decreasing nurses' work productivity. Based on the results of the background above, this study aims to analyze job factors and work environment factors on work productivity through burnout in nurses at Bhayangkara Hospital in Makassar.

METHOD

This research is a quantitative study with a cross-sectional analytical observational design, where independent and dependent variables were measured simultaneously at one point in time. The study was conducted from June to July 2025 at Bhayangkara Hospital Makassar. The study population consisted of 168 nurses working at the hospital. The sample size was determined using the Slovin formula, resulting in 130 respondents selected through a purposive sampling technique. Inclusion criteria included nurses who had worked at the hospital for at least six months and agreed to participate voluntarily. Exclusion criteria were nurses on leave or with incomplete questionnaire data. Exit criteria applied to respondents who withdrew participation during the data collection process.

Variables Analyzed

The variables analyzed in this study included:

- 1) Independent variables: lighting, physical workload, mental workload, interpersonal conflict.
- 2) Dependent variable: work productivity.
- 3) Intermediary variable: burnout.

Lighting was measured as a physical environmental factor, while mental workload and burnout were treated as psychosocial factors influencing productivity.

Instruments, Techniques, and Procedures

- 1) Questionnaire for respondent characteristics, interpersonal conflict, and work productivity.
- 2) Lux meter to measure lighting intensity.
- 3) Oximeter to assess physical workload.
- 4) NASA-TLX for mental workload assessment.
- 5) MBI (Maslach Burnout Inventory) for burnout measurement.

All instruments had undergone validity testing. The validity test compared the calculated *r* value with the *r* table to ensure that each item accurately measured the intended variable. Reliability testing used Cronbach's alpha, with a coefficient >0,60 indicating reliability.

Data Collection Process

Data collection was carried out directly in the hospital environment. Respondents who met the inclusion criteria received information about the study and signed informed consent. Measurements were then taken using standardized instruments, and respondents completed the questionnaire independently under researcher supervision.

Data Analysis Process

The collected data were processed using IBM SPSS Statistics and AMOS version 26 through the following

stages: editing, coding, entry, cleaning, and scoring.

- 1) Univariate analysis was performed to describe the distribution of each variable.
- 2) Bivariate analysis used the chi-square test to assess relationships between independent and dependent variables.
- 3) Multivariate analysis employed path analysis to evaluate causal pathways and intermediary effects.

Ethical Aspects

The study obtained ethical clearance from Department of Occupational Safety and Health Hasanuddin University with number 875/UN4.14.1/TP.01.02/2025 and protocol number is 14225062114 to data collection. All participants received clear explanations regarding the research objectives and procedures. Participation was voluntary, and confidentiality of respondent data was strictly maintained.

RESULTS

This study shows that the majority of nurse respondents at Bhayangkara Hospital Makassar are aged 26-35 years (64 percent), with 86 percent being female. Most respondents have a Diploma III education (63 percent), followed by Bachelor's degree (35 percent). Based on physical workload measurements, 52 percent of nurses experience a heavy physical workload, while 48 percent experience a light workload. For mental workload, 49 percent of nurses experience a heavy mental workload, and 42 percent experience a low workload. The majority of nurses work the morning shift (42 percent), followed by the night and afternoon shifts (29 percent each). A total of 54 percent of nurses work in an environment with standard lighting, while 46 percent in an environment that does not meet standards. Regarding interpersonal conflict, 46 percent of respondents reported conflict in the workplace. Based on work productivity, 58 percent of nurses have good work productivity, while 42 percent show poor work quality. For burnout, 48 percent of nurses experience high levels of burnout, 22 percent moderate levels, and 30 percent low levels.

Bivariate Analysis

Based on the table 1, heavy physical workloads tend to reduce productivity and increase the risk of burnout in nurses, as seen from the dominant figures for low productivity (42) and high burnout (38). Statistical test results with p-values of 0,000 and 0,001 indicate that the effect of physical workload on both productivity and burnout is statistically significant.

Table 1. The effect of physical workload on work productivity and burnout in nurses at Bhayangkara Hospital, Makassar					
Physical Workload	Productivity		High	Burnout	
	Not enough	Good		Moderate	Low
Heavy	42	26	38	19	11
Moderate	9	53	25	9	28
P-value	0,000			0,001	

The table shows that heavy mental workload is more associated with low productivity (34) and high burnout (33), while low mental workload is more associated with good productivity (45) and low burnout (25). The p-values of 0,000 and 0,010 confirm that mental workload has a significant effect on productivity and burnout in nurses.

Table 2. The effect of mental workload on work productivity and burnout in nurses at Bhayangkara Hospital, Makassar					
Physical Workload	Productivity		High	Burnout	
	Not enough	Good		Moderate	Low
	n	n	n	n	n
Heavy	34	29	33	17	13
Moderate	7	5	7	4	1
Low	10	45	23	7	25
P-value	0,000			0,010	

The data on table 3 shows that morning shifts are more associated with good productivity (39) but also have the highest number of high burnout (29), while night shifts are more dominant in low productivity (20) and high burnout (24). The p-values of 0,039 and 0,007 indicate a significant effect of work shifts on productivity and burnout in nurses.

Table 3. The effect of work shifts on work productivity and burnout in nurses at Bhayangkara Hospital, Makassar

Work Shift	Productivity			Burnout	
	Not enough	Good	High	Moderate	Low
	n	n	n	n	n
Evening	20	19	24	3	12
Afternoon	17	21	10	13	15
Morning	14	39	29	12	12
P-value	0,039			0,007	

The table 4 shows that both standard and non-standard lighting have a relatively even distribution of productivity and burnout, with no significant differences between groups. This is supported by p-values of 0,729 and 0,286, respectively, indicating that lighting has no significant effect on productivity or burnout in nurses.

Table 4. The effect of lighting on work productivity and burnout in nurses at Bhayangkara Hospital, Makassar

Lighting	Productivity			Burnout	
	Not enough	Good	High	Moderate	Low
	n	n	n	n	n
Not Up to Standard	25	35	31	15	14
According to Standards	26	44	32	13	25
P-value	0,729			0,286	

Table 5 shows that in both groups with and without interpersonal conflict, the distribution of productivity and burnout was relatively balanced, with no significant differences. This is supported by p-values of 0,480 and 0,449, respectively, indicating that interpersonal conflict had no significant effect on productivity or burnout in nurses.

Table 5. The effect of interpersonal conflict on work productivity and burnout in nurses at Bhayangkara Hospital, Makassar

Interpersonal Conflict	Productivity			Burnout	
	Not enough	Good	High	Moderate	Low
	n	n	n	n	n
There is Interpersonal Conflict	26	34	30	15	15
No Interpersonal Conflict	25	45	33	13	24
P-value	0,480			0,449	

Based on table 6, it can be seen that nurses with high levels of burnout have a nearly balanced distribution of work productivity between those with poor (50,8 %) and those with good (49,2 %), with a p-value of 0,000, indicating a significant relationship between burnout and work productivity. Meanwhile, at moderate and low levels of burnout, more nurses have good work productivity, especially at low levels of burnout, where 89,7 % of nurses have good productivity.

Table 6. Cross Tabulation of Burnout with Work Productivity at Bhayangkara Hospital Makassar

Burnout	Work Productivity				p-Value
	Not enough		Good		
	n	%	n	%	
High	32	50,8	31	49,2	0,000
Moderate	15	53,6	13	46,4	
Low	4	10,3	35	89,7	

Analysis Multivariate

The multivariate analysis used in this study is path analysis, which aims to determine the influence of

intervening variables on the relationship between variables. As a preliminary step before conducting path analysis, a normality test is necessary to ensure that the data used are normally distributed and meet the basic assumptions of multivariate statistical analysis.

Table 7. Multivariate Normality Test Results One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		130
Normal Parameters ^{a,b}	Mean	0,0000000
	Standard Deviation	15,95162163
Most Extreme Differences	Absolute	0,079
	Positive	0,079
	Negative	-0,037
Kolmogorov-Smirnov Z		0,896
Asymp. Sig. (2-tailed)		0,398
Note: a. Test distribution is Normal.		

Based on the output shown in the one-sample Kolmogorov-Sminrov test table, the Asymp. Sig. (2-tailed) value is 0,362. This value is greater than the specified significance level of 0,05. Therefore, it can be concluded that the residual data is normally distributed. Thus, the assumption of normality in the regression has been met and can be used for further testing.

Table 8. Parameters and Hypothesis Testing of Direct Effect				
Research Variables	Estimate	SE	CR	p-Value
Physical Workload → Burnout	0,810	0,300	2,703	0,007
Mental Workload → Burnout	0,116	0,047	2,459	0,014
Shift Work → Burnout	-0,962	1,422	-0,676	0,499
Lighting → Burnout	-0,046	0,023	-2,010	0,044
Interpersonal Conflict → Burnout	-0,049	0,153	-0,318	0,751
Physical Workload → Work Productivity	-0,971	0,375	-2,587	0,010
Mental Workload → Work Productivity	-1,141	0,059	-2,406	0,016
Work Shift → Work Productivity	5,079	1,736	2,926	0,003
Lighting → Work Productivity	0,000	0,028	0,016	0,988
Interpersonal Conflict → Work Productivity	0,014	0,187	0,074	0,941
Burnout → Work Productivity	-0,403	0,107	-3,761	0,000

Based on table 8, it can be concluded that physical and mental workload have a direct effect on burnout, with p-values of 0,007 and 0,014, respectively, and estimate values of 0,810 and 0,116. Work shifts, lighting, and interpersonal conflict do not have a direct effect on burnout, with p-values greater than 0,05. Physical and mental workload also have a direct effect on work productivity, with p-values of 0,010 and 0,016, and estimate values of -0,971 and -0,141. Work shifts have a direct effect on work productivity (p-value 0,003, estimate 5,079), while lighting and interpersonal conflict have no direct effect (p-value 0,988 and 0,941). Burnout has a significant effect on work productivity with a p-value of 0,000 and an estimate value of -0,403.

Table 9. Results of Indirect Effect Hypothesis Testing with Sobel Test		
Track	Indirect Effects	Conclusion
Physical Workload → Burnout → Work Productivity	0,067	Not Significant
Mental Workload → Burnout → Work Productivity	0,061	Not Significant
Work Shift → Burnout → Work Productivity	0,017	Significant
Lighting → Burnout → Work Productivity	0,050	Not Significant
Interpersonal Conflict → Burnout → Work Productivity	0,008	Significant

Based on table 9, it can be concluded that physical workload, mental workload, and lighting do not have

an indirect effect on work productivity through burnout, because the indirect effect value is not significant. Meanwhile, work shifts and interpersonal conflict have an indirect effect on work productivity through burnout, with a significant indirect effect value, indicating that burnout mediates the relationship between these two factors and work productivity. Based on the results of the path analysis, the results of the regression values, direct and indirect effects were obtained, which then revealed the results of the scheme of the influence of work factors and work environment factors on work productivity through burnout as an intervening variable.

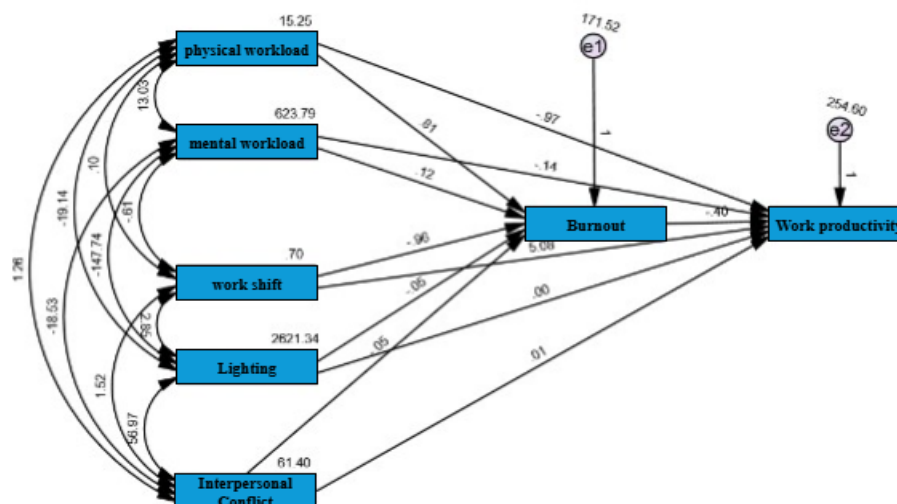


Figure 1. Final Path Analysis Model

DISCUSSION

The effect of physical workload on work productivity and burnout

The results of this study indicate a significant influence between physical workload and work productivity. These results are in line with research Bhaktiyono et al.⁽¹⁷⁾ conducted on nurses at South Tangerang General Hospital in 2022 showing that there is a relationship between physical workload and work productivity as evidenced by the results of the chi-square test with a p-value of 0,004. These results are not in line with research conducted by Waryantini et al.⁽¹⁸⁾ that there is no significant relationship between physical workload and work productivity. This is due to the high physical adaptability of nurses. In addition, a supportive hospital work system such as fair shift distribution, the availability of work aids such as wheelchairs and push beds and solid teamwork can help alleviate the physical burden experienced by nurses. Workload is a number of processes or activities that must be completed by a person within a certain period of time. Excessive physical workload on nurses can reduce work productivity by causing muscle fatigue, so hospital management needs to pay attention to workload distribution, balanced shift arrangements, and the provision of rest facilities and work aids to maintain physical health and prevent fatigue.

Meanwhile, physical workload has a significant positive effect on burnout. This result is in line with research Pujiarti⁽¹⁹⁾ on nurses at Koja Hospital, Jakarta, which showed a significant relationship between physical workload and burnout, as evidenced by the chi-square test results with a p-value of 0,001. Burnout experienced by nurses can reduce service quality, reduce job satisfaction, and increase the risk of errors in providing nursing care. Excessive workload can cause changes in psychological conditions. Nurses have different levels of workload between units or inshighations, this may cause differences in psychological conditions. This is in line with the Job Demands-Resources (JD-R) model, which explains that the existence of work resources, including physical adaptation, experience, and team support, can moderate or even eliminate the negative impact of job demands on burnout. Therefore, it is important for hospital management to adjust work systems, such as arranging fair shift schedules, optimizing the number of nursing staff, and utilizing technology to ease the physical burden on nurses. In addition, programs to improve stress management skills and strengthen nurses' mental resilience also need to be implemented to maintain optimal performance and prevent the negative impacts of physical and psychological workload.

The effect of mental workload on work productivity and burnout

The results of this study indicate that physical workload has a significant positive effect on work productivity. This result is in line with research Ahmad et al.⁽²⁰⁾ on nurses at Andi Makkasau Parepare Regional General Hospital, which explains that mental workload experienced by nurses can reduce work productivity in nurses,

between mental workload and work productivity there is a significant relationship with a p-Value of 0,019. Work productivity is not only determined by technical abilities, but is also greatly influenced by various psychosocial factors faced in the work environment. This study indicates that mental workload affects work productivity. Excessive workload obtained can have a negative impact on work productivity for nurses if it is not balanced with the abilities and qualities possessed by the nurse. The more work given, the lower the productivity in doing a job.⁽²¹⁾ Mental workload does not always have a direct impact on work productivity. However, mental workload that is allowed to continue can cause stress that risks reducing the quality of service. Therefore, it is important for hospital management to conduct periodic evaluations, proportional task distribution and also provide psychological support. Thus, a menhighy healthy work environment will support nurses' work productivity in a sustainable manner.

There is a very significant influence of mental workload on burnout. This study is in line with the statement from Julia et al.⁽²²⁾ based on the results of his research on nurses at Sidoarjo Regional Hospital which explains that the mental workload that occurs in nurses can cause burnout in nurses, between mental workload and burnout there is a relationship with a p-Value of 0,000. High mental workload can cause various negative impacts, including difficulty in concentrating, feelings of anxiety, worry, restlessness, forgetfulness, irritability, easy debt, to feelings of hopelessness. This condition shows that mental workload not only has implications for cognitive aspects, but also affects the emotional and psychological conditions of nurses. The increase in nurses' workload can be caused by the increasing number of patients to be treated, especially in service units with high occupancy rates. Furthermore, the imbalance between the workload given and the number of available nursing staff can cause work overflow, which is a condition when work needs exceed the capacity of existing human resources. This situation can alleviate work stress, reduce the quality of service, and increase the risk of medical errors.

The effect of work shifts on work productivity and burnout

The results of this study indicate a significant influence between work shifts and work productivity. These results are in line with the statement from Panghestu et al.⁽²³⁾ based on the results of his research on nurses at Madiun City Hospital in 2023 which explains that physical and mental fatigue that occurs in nurses can reduce work productivity in nurses, between nurse work shifts and work fatigue there is a relationship with a p-Value of 0,000. This condition shows that work scheduling systems such as rotating night shifts, long shifts, or rotations are not able to contribute directly to the decline in workforce performance that surrounds.⁽²⁴⁾ Increased productivity on night shifts can be caused by a relatively lower workload due to fewer patients, so nurses can work more focused, as well as a calmer work atmosphere. In addition, on night shifts there is usually more flexible time in completing tasks without many interruptions from administrative activities or patient family visits. However, working on night shifts still has the risk of circadian rhythm disruption which can affect physical and mental health in the long term.⁽²⁵⁾

The results of this study indicate no significant relationship between work shifts and burnout. This result is inconsistent with research conducted by Julia et al.⁽²²⁾ which states that work shifts have a significant influence through the Spearman correlation test showing the influence of work shifts on burnout syndrome in nurses. Based on these results, it can be seen that night shift nurses are most susceptible to burnout syndrome. It is known that the working time on the night shift is 10 hours with a total of 6-7 nurses, which is less than the number of morning shift nurses who work only 7 hours. Working the night shift will affect the body's physiological response. In general, the human body is active during the day when the circadian rhythm is high and rests at night when the circadian rhythm is low.⁽²⁶⁾ However, the circadian rhythm is reversed when the body is forced to work at night and rest during the day. This decrease in performance can cause errors that have the potential to cause accidents or injuries. Shift nurses are at higher risk of burnout.⁽²⁷⁾

The effect of lighting on work productivity and burnout

The findings in this study indicate that lighting does not have a significant direct influence on work productivity. One possible reason is that the lighting in the nurses' work environment has met minimum standards of visual comfort, so it is no longer a variable that influences work productivity. In this condition, lighting is an element that is considered sufficient and does not provide additional stimuli that can significantly increase or decrease productivity. This study is in line with the findings Hoshi et al.⁽²⁸⁾ which show that lighting does not have a significant effect on work productivity. In his study, even though the lighting is dim, this effect does not have a direct impact on nurses' work productivity. In addition, nurses' work productivity is not always determined by lighting, but rather is more influenced by stress levels, physical fatigue, and support from fellow workers. In high-paced jobs such as nursing, where social interaction, quick decision-making, and multitasking are more dominant, lighting is not always a crucial element.⁽²⁹⁾

The results of this study indicate that lighting has a significant direct effect on burnout. This finding indicates that optimal lighting can increase nurses' alertness and reduce the rate of work errors. Conversely, if lighting

is poor, it not only accelerates physical fatigue but can also cause prolonged mental stress that can develop into burnout if not managed properly and will impact the quality of health services. These results are in line with research conducted by Nizzer et al.⁽³⁰⁾ which shows that lighting has a positive effect on burnout in nurses. Inadequate lighting can cause physical and mental fatigue in nurses which then has the potential to increase the risk of burnout. This study indicates that although lighting can affect short-term fatigue, burnout as a chronic psychological condition is not directly affected by lighting intensity.

The influence of interpersonal conflict on work productivity and burnout

Based on the research results, interpersonal conflict does not significantly impact nurses' work productivity. This is because the interpersonal conflicts that occur are minor and can be resolved quickly through good communication and informal mediation between colleagues. These conflicts, which do not develop into major problems, usually do not disrupt nurses' focus or concentration in carrying out their duties, thus maintaining nurse productivity. Nurses' ability to adapt and employ effective conflict resolution strategies allows for conflicts that arise to be managed without disrupting overall nurse productivity. This research indicates that interpersonal conflict is not a primary factor in decreasing nurse productivity. There are other factors that are more dominant in influencing work productivity, such as workload and work shifts.

The results of this study indicate that interpersonal conflict does not have a significant influence on burnout. This finding suggests that interpersonal conflict may not be the main factor influencing burnout in the context of this study. This could mean that other factors such as physical workload, mental workload, or working conditions may have a greater influence on the occurrence of burnout than interpersonal conflict. In addition, this result may also indicate that these individuals may have effective coping strategies or adaptive mechanisms in managing interpersonal conflict so that it does not significantly influence the occurrence of burnout. This study is in line with research conducted by Amaliyah et al.⁽³¹⁾ on nurses at Dr. Tadjudin Chalid General Hospital which showed that interpersonal conflict did not have a significant relationship with burnout. This result is evidenced by the p-Value of 0,733, the study explains that although interpersonal conflict can cause discomfort at work, its impact can often be minimized through social support from coworkers, good communication skills, and the existence of a conflict management system implemented in the hospital. Minor conflicts or those that can be resolved quickly may not be significant enough to significantly influence the occurrence of burnout. On the other hand, conflicts that are deeper in nature or that last for a long time may have a greater impact.

The effect of burnout on work productivity

The results of this study indicate that burnout has a significant direct impact on nurses' work productivity. These findings indicate that higher levels of perceived burnout are followed by decreased work productivity. This occurs because nurses lose physical and mental energy, making them more easily tired, losing focus, and having difficulty maintaining concentration while working. This leads to a decrease in task completion and a decrease in the speed and accuracy of service delivery. Burnout has also been found to impact work absence, decreased nurse engagement, and increased work errors, all of which can contribute to a decrease in overall work productivity. Nurses with low work productivity tend to have a greater proportion of high and moderate burnout than nurses with high productivity, while nurses with high productivity are predominantly low burnout. These research findings emphasize the importance of burnout management efforts as a strategy to improve nurses' work productivity. Hospitals need to develop comprehensive intervention programs, including stress management training, psychological support, and regular workload monitoring. Furthermore, providing facilities that support physical and mental well-being, such as balanced shift rotations, adequate rest rooms, and counseling or mentoring, can help nurses manage work stress.

Indirect Influence

In a competitive work environment, mental workload is one of the factors often identified as the main cause of burnout among nurses. This study explores how mental workload can affect work productivity, with burnout acting as a mediating variable. Burnout can arise as a response to prolonged work stress, including mental workload. However, in this study, burnout did not mediate the relationship between mental workload and work productivity. This can be interpreted as meaning that, although nurses experience burnout, they still strive to maintain work performance due to internal motivation, professional responsibilities, and service standards that must be met. In contrast to research conducted by Gunduz et al.⁽³²⁾ which showed that high mental workload is strongly correlated with burnout, this confirms that in the nursing profession, intense cognitive demands can directly affect nurses' mental health. Mental workload includes quick decision-making, priority management, handling complex situations, and the need for continuous concentration throughout working hours.

Furthermore, this study shows that a high physical workload can trigger burnout in nurses, ultimately reducing work productivity. An unbalanced workload, both physically and mentally, can lead to fatigue that affects psychological aspects, such as decreased motivation and ability to focus. Therefore, it is important

for hospital management to organize work systems, including balanced shift arrangements, providing assistive devices, and supporting nurses' physical and mental health through stress management programs. Another factor affecting productivity is lighting, which, although affecting comfort, does not have a significant impact on burnout and productivity when compared to other factors such as workload and social support. Furthermore, interpersonal conflict in the workplace has been shown to affect nurse productivity through burnout, indicating the need for managerial interventions in conflict management and the establishment of a good communication culture in hospitals. Good nurse well-being can be maintained through coping training strategies, adequate social support, and more efficient work shift management, all of which contribute to optimal nurse work productivity.

LIMITATIONS

This study has several limitations that should be acknowledged. The research design used was cross-sectional, which limits the ability to establish causal relationships between variables. The measurements were taken at a single point in time, so changes in workload, burnout, or productivity over different periods could not be observed. In addition, the study relied heavily on self-reported questionnaires for several variables such as mental workload, interpersonal conflict, and burnout, which may have been influenced by subjective perceptions, recall bias, or social desirability bias. The use of purposive sampling and the study being conducted in a single hospital setting also limit the generalizability of the findings to other healthcare institutions with different organizational structures, workloads, or cultural contexts.

This study did not control for several external and individual factors that may influence burnout and productivity, such as personal coping mechanisms, social support outside the workplace, individual resilience levels, or organizational policies beyond shift arrangements. Environmental variables such as lighting were measured objectively, but other factors like noise, temperature, and ergonomic aspects were not included in the analysis, which may also play a role in influencing nurse well-being and performance. Furthermore, although path analysis was used to explore indirect effects, the model may not fully capture the complexity of the interactions between psychosocial and environmental factors in the nursing work environment. Future studies with longitudinal or experimental designs, broader populations, and additional contextual variables are needed to provide a more comprehensive understanding of the dynamics between workload, burnout, and work productivity.

CONCLUSIONS

This study aimed to analyze the effect of work factors and work environment factors on work productivity through burnout as an intervening variable among nurses at Bhayangkara Hospital Makassar. The findings indicate that physical and mental workloads have a direct influence on work productivity but do not exert an indirect effect through burnout. In contrast, work shifts and interpersonal conflict do not have a direct effect on productivity but demonstrate an indirect influence through burnout. Lighting shows a direct effect on productivity without an indirect pathway through burnout. These results highlight that burnout acts as a mediating factor for certain work-related variables, particularly those related to organizational and interpersonal aspects, while physical and environmental factors exert a more immediate impact on productivity. Based on these findings, it is recommended that the hospital implement regular evaluations of physical and mental workloads, improve shift management, provide stress management and counseling services, and strengthen communication and teamwork programs to minimize conflict. Nurses are encouraged to recognize early signs of burnout, develop time management and interpersonal skills through training, and actively participate in internal communication forums to enhance collaboration and support. Future research should adopt qualitative or mixed-method approaches to explore nurses' subjective experiences more deeply, incorporate additional variables such as job satisfaction and social support, and conduct comparative studies across hospitals or different units to identify variations in burnout and productivity patterns associated with diverse work environments and organizational systems.

REFERENCES

1. Liana Y. Analisis Faktor Yang Berhubungan Dengan Burnout (Kejenuhan Kerja) Pada Perawat. *J Ilmu Kesehat Bhakti Husada Heal Sci J*. 2020;6(1):108.
2. Latupeirissa WL. Manajemen Rumah Sakit untuk Mahasiswa dan Praktisi. Nasrudin M, editor. *Nasya Expanding Management*; 2022.
3. Wirati NPR, Wati NMN, Saraswati NLGI. Hubungan Burnout Dengan Motivasi Kerja Perawat Pelaksana. *J Kepemimp dan Manaj Keperawatan*. 2020;3(1):8.

4. Azizah. Hubungan Penggunaan Alat Pelindung Diri (APD) Dan Stres Kerja Dengan Kecelakaan Kerja Pada Tenaga Kesehatan Di Instalasi Bedah Sentral (IBS) RSUP Dr. M. Djamil Padang Tahun 2022. 2022.
5. Kesworowati D, Setiyadi A, Handayani. Organizational Effort Factors Dan Burnout Pada Perawat Di Unit Perawatan Terpadu. *Binawan Student J.* 2023;5(1):40-6.
6. Irawan DS, Hastuti RY, Budiman NA. Hubungan Stres Kerja Dengan Burnout Rsup Dr . Soeradji Tirtonegoro Klaten Tahun 2022. *Cohesin 1St.* 2022;1(1):22-9.
7. Fatimah FS, Yugistiyowati A. Burnout Pada Perawat di Ruang Rawat Inap di Rumah Sakit: Studi Deskriptif. *Indones J Hosp Adm.* 2022;5(2):90.
8. Cortés-Álvarez NY, Lara-Morales A, Bautista-Rodríguez E, Marmolejo-Murillo LG, Jiménez AD, Hernández LAV, et al. Job burnout, cognitive functioning, and Brain-derived neurotrophic factor expression among hospital Mexican nurses. *PLoS One.* 2024;19(5):1-19. <https://doi.org/10.1371/journal.pone.0304092>
9. Hayati FR, Mutiari D. Pengaruh Sistem Pencahayaan Terhadap Kenyamanan Pasien Pada. *Semin Ilm Arsit III.* 2022;3:722-33.
10. Aemmi SZ, Mohammadi E, Heidarian-Miri H, Fereidooni-Moghadam M, Boostani H, Zarea K. The effectiveness of bright light exposure in shift-worker nurses: A systematic review and meta-analysis. *Sleep Sci.* 2020;13(2):145-51. <https://doi.org/10.5935/1984-0063.20190137>
11. Chairany D, Mendrofa HK. Analisis Faktor Yang Mempengaruhi Terjadinya Burnout Pada Perawat Di Murni Teguh Memorial Hospital. *Indones Trust Nurs J.* 2023;1(3):9-19.
12. Hikmat R, Melinda M. Hubungan Beban Kerja Dengan Kepuasan Kerja Perawat. *J Kesehat.* 2020;10(2):135-41.
13. Bowdring MA, Loftus P, Wang SD, Pang RD, Kirkpatrick MG. Interactive associations between abstinence plans and romantic partner conflict and support with cigarette smoking. *Drug Alcohol Depend.* 2023;243:109756. <https://doi.org/10.1016/j.drugalcdep.2022.109756>
14. Febryanti R, Damayanti DD, Alamanda KP. Pengaruh Stres Kerja Terhadap Burnout Karyawan Generasi Y di Universitas Muhammadiyah Kalimantan Timur. *Schema J Psychol Res.* 2023;8(1):9-15.
15. Agastya PY, Satria IH. PENGARUH KONFLIK INTERPERSONAL DAN BEBAN KERJA TERHADAP STRES KERJA PADA PEGAWAI DI DINAS PERHUBUNGAN PROVINSI BALI. *E-Jurnal Manaj Univ Udayana.* 2018;7(8):4570.
16. Wiyarso J. Hubungan Antara Shift Kerja Dan Beban Kerja Dengan Kelelahan Kerja Pada Perawat Di Ruang Rawat Inap Yeheskiel Dan Hana Di Rumah Sakit Umum Gmim Pancaran Kasih Manado. 2018;7(5).
17. Bhaktiyono DY, Ratnaningtyas TO, Fadhilah H, Adha MZ. Hubungan Lingkungan Kerja Fisik dan beban Kerja Fisik dengan Tingkat Produktivitas Kerja pada Perawat di Instalasi Rawat Jalan dan Rawat Inap RSUD Kota Tangerang Selatan pada Era Pandemi. *Fram Heal J.* 2022;1(1):153-62.
18. Waryantini, Maya. Hubungan Beban Kerja Dengan Kinerja Perawat Dalam Melakukan Asuhan Keperawatan Di Ruang Rawat Inap Rumah Sakit. *Heal J.* 2020;8(1):49-57.
19. Pujiarti P, Lia Idealistiana. Pengaruh Lama Kerja Dan Beban Kerja Perawat Terhadap Burnout. *J Ilm Keperawatan.* 2023;9(4):354-60.
20. Ahmad MF, Azis AH, Arifuddin NF. Pengaruh Beban Kerja Mental dan Kualitas Tidur terhadap Produktivitas Kerja pada Perawat di RSUD Andi Makkasau Parepare. *Indones Res J Educ.* 2025;5(4):596-601.
21. Ramos-Villagrasa PJ, Barrada JR, Fernández-del-Río E, Koopmans L. Assessing Job Performance Using Brief Self-report Scales: The Case of the Individual Work Performance Questionnaire. *Rev Psicol del Trab y las Organ.* 2019;35(3):195-205. <https://doi.org/10.5093/jwop2019a21>
22. Julia F, Suryono H, Kriswandana F, Winarko W, Faruk U. Pengaruh Beban Kerja Mental, Shift, Dan

Masa Kerja Terhadap Burnout Syndrome Perawat Di Rumah Sakit. J Ris Kesehat Poltekkes Depkes Bandung. 2025;17(1):147-53.

23. Panghestu WKP, Sujangi, Jayadi H, Yulianto B, Prasetyo A. Pengaruh Shift Kerja Terhadap Kelelahan Kerja Perawat di RSUD Kota Madiun Tahun 2023. JPKM J Profesi Kesehat Masy. 2024;5(1):35-8.

24. Mokodompit HKN, Tendean LEN, Mantik MFJ. Analisis Hubungan Tingkat Kesejahteraan Tanggung Jawab dan Motivasi terhadap Kepuasan Kerja Perawat dan Bidan. e-CliniC. 2021;9(2):517.

25. Satriani NF, Saranani M, Narimi. Perbedaan Tingkat Stres Kerja Antara Shift Pagi, Sore dan Malam pada Perawat Rawat Inap Ruangan Lavender dan Mawar di RSUD Kota Kendari. J Ilm Karya Kesehat. 2021;1(02):17-24.

26. Brum MCB, Senger MB, Schnorr CC, Ehlert LR, Rodrigues T da C. Effect of night-shift work on cortisol circadian rhythm and melatonin levels. Sleep Sci. 2022;15(02):143-8. <https://doi.org/10.5935/1984-0063.20220034>

27. Cheng H, Liu G, Yang J, Wang Q, Yang H. Shift work disorder, mental health and burnout among nurses: A cross-sectional study. Nurs Open. 2023;10(4):2611-20.

28. Hoshi H, Iwasa H, Goto A, Yasumura S. Effects of working environments with minimum night lighting on night-shift nurses' fatigue and sleep, and patient safety. BMJ Open Qual. 2022;11(1):1-7. <https://doi.org/10.1136/bmjoq-2021-001638>

29. Adventina T, Widanarko B. ANALISIS FAKTOR PENCAHAYAAN BERHUBUNGAN DENGAN KELELAHAN KERJA PADA PERAWAT DI RUMAH SAKIT : SEBUAH TINJAUAN PUSTAKA SISTEMATIS. JKM J Kesehat Masy Cendekia Utama. 2021;9(1):19.

30. Nizzer S, Baliga S, McKay SM, Holness DL, King EC. Sustaining a Workforce: Reflections on Work from Home and Community Care Nurses Transitioning out of the COVID-19 Pandemic. SAGE Open Nurs. 2024;10. <https://doi.org/10.1177/23779608241264162>

31. Amaliyah R, Sumiaty, Rezky Aulia Yusuf, Mansur Sididi, Andi Sani. Faktor Yang Berhubungan Dengan Stres Kerja Pada Perawat Di RSUD Dr. Tadjuddin Chalid. Wind Public Heal J. 2024;5(2):196-204.

32. Gündüz ES, Öztürk NK. Mental workload as a predictor of burnout in intensive care nurses. Nurs Crit Care. 2025;30(2). <https://doi.org/10.1111/nicc.13173>

FINANCING

The authors did not receive financing for the development of this research.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Gagarin Gyardani Samani, Syamsiar S. Russeng, Lalu Muhammad Saleh, Yahya Thamrin, Apik Indarty Moedjiono.

Data curation: Gagarin Gyardani Samani.

Formal analysis: Gagarin Gyardani Samani.

Research: Gagarin Gyardani Samani.

Methodology: Gagarin Gyardani Samani, Syamsiar S. Russeng, Lalu Muhammad Saleh, Yahya Thamrin, Apik Indarty Moedjiono.

Project management: Gagarin Gyardani Samani, Syamsiar S. Russeng, Lalu Muhammad Saleh.

Resources: Gagarin Gyardani Samani.

Software: Gagarin Gyardani Samani.

Supervision: Syamsiar S. Russeng, Lalu Muhammad Saleh.

Validation: Yahya Thamrin, Apik Indarty Moedjiono.

Display: Gagarin Gyardani Samani.

Drafting - original draft: Gagarin Gyardani Samani.

Writing - proofreading and editing: Gagarin Gyardani Samani.