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Impact of Sleep Quality, Workload, Job stress, and Coping Strategies on Work Fatigue among Nurses at Hermina Hospital Manado

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ABSTRACT

Work fatigue in nurses affects patient care, including patient safety, the risk of patient falls, and medical errors, and decreases organizational performance. This study evaluates the relationship between sleep quality, workload, job stress, and coping strategies with work fatigue among nurses at Hermina Manado Hospital. The approach utilized involves observational analysis using a cross-sectional method involving a sample of 63 nurses, using questionnaires, Spearman correlation analysis and logistic regression. The results show that most respondents experienced moderate levels of work fatigue (69.8%), poor sleep quality (61.9%), heavy workload (57.1%), moderate job stress (63.5%), and use of emotion-based coping strategies (85.7%). Spearman correlation showed a positive relationship between sleep quality (r = 0.444; p = 0.000), workload (r = 0.429; p = 0.000), job stress (r = 0.507; p = 0.000), coping strategies (r = 0.268; p = 0.034) and work fatigue. Multivariate analysis yielded (Exp(B) 14.756; p = 0.019) for job stress. It can be inferred that there is a relationship between sleep quality, workload, job stress, and coping strategies with work fatigue in nurses, with the most dominant factor being job stress.

Keywords: Sleep Quality, Workload, Job stress, Coping Strategies, Work Fatigue

1. INTRODUCTION

A hospital is a healthcare facility that provides promotive, preventive, curative, rehabilitative, and palliative services. These services include outpatient care, inpatient care, and emergency care, all of which require professional healthcare workers, including nurses. Nurses, as the biggest group of healthcare workers in Indonesia, play a crucial role in 24-hour healthcare services (Kemenkes RI, 2020; Peršolja, 2023).

The intense and continuous role of nurses puts them at high risk of work fatigue. This fatigue, resulting from various factors such as patients' varying conditions, long working hours, and heavy workloads, can reduce productivity and physical resilience (Lestari, Jingga, & Wahyudiono, 2023; Sari, 2020). The impacts include a decline in service quality, an increase in medical errors, and the risk of workplace accidents (Jun et al., 2021; Lee & Kang, 2020).

Sleep quality, workload, and job stress are factors contributing to nurses' work fatigue. Poor sleep quality, often due to shift work, significantly impacts fatigue (Rizky & ., 2018; Wijanarti & Tesha, 2022). A heavy workload that is disproportionate to working capacity is also a significant cause of fatigue (Lestari, Jingga, & A. Wahyudiono, 2023). Nurses who work for 16 hours experience higher stress,

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which correlates with increased work fatigue (Hosona & Uesugi, 2023).

Coping strategies, whether problem-focused or emotion-focused, are necessary to manage stress and reduce work fatigue (Al Barmawi et al., 2019; Bregar, B., Skela-Savič, B., & Plesničar, 2018). Hermina Manado Hospital, as a type C hospital, faces an increasing number of patients each year, which demands optimal nursing staff to maintain the quality of service. However, the shortage of nurses leads to increased workload and fatigue, affecting the quality of service and patient safety.

Based on this background, this study aims to analyze the link between sleep quality, workload, job stress, and coping strategies with work fatigue among nurses at Hermina Manado Hospital. The research results are expected to improve the quality of healthcare services and the effectiveness of nursing care.

2. RESEARCH METHODOLOGY

The research design is a plan arranged in such a way as to guide the researcher in obtaining answers to the research questions. The researcher collected data at one point in time to avoid longer durations and to be relatively more affordable. Hence, this category of research utilizes an observational analytic design with an approach of cross-sectional to analyze the link between sleep quality, workload, job stress, and coping strategies with work fatigue among nurses at Hermina Manado Hospital. This research was conducted from October 2023 to April 2024 at Hermina Manado Hospital.

The target population of the research is all nurses working at Hermina Manado Hospital. In contrast, the accessible population consists of nurses working shifts in 24-hour service units in the emergency room and inpatient wards, totaling 63 nurses. The sampling was done using the total sampling method, where all nurses meeting the inclusion and exclusion criteria were included. Bias can be reduced by ensuring that all members of the population are included in the study. The inclusion criteria include the executing nurses of Hermina Manado Hospital who are willing to be respondents.

In contrast, the exclusion criteria include nurses who are on leave, on study assignments or have a history of psychiatric disorders related to sleep disturbances. This study includes the dependent variable which is work fatigue; and the independent variables are sleep quality, workload, job stress, and coping strategies.

Before its implementation, this research gained ethical approval from the Ethics Committee, Prof. Dr. R. D. Kandou Central General Hospital, with number 018/EC/KEPK-KANDOU/I/2014. All nurses received the study explanation and signed the informed consent form before joining the study.

2.1 Research Instrument

This study uses questionnaires as data collection tools to produce valid and reliable quantitative data.

a. Work Fatigue Questionnaire

- The IFRC questionnaire was used in the Indonesian edition by Tarwaka (2010).
- Consists of 30 items divided into three sections: activity weakening, motivation weakening, and physical fatigue.
- Ramdan (2019) tested the validity and reliability of nurses in East Kalimantan with a Cronbach's alpha value of 0.921 (Ramdan, 2019).
- A 4-point Likert scale is used to measure respondents' complaints, with fatigue levels classified as moderate (0-60) and severe (61-120).

b. Sleep Quality Questionnaire

- Uses the Pittsburgh Sleep Quality Index (PSQI) translated into Indonesian.
- Validity and reliability were tested by Rizky (2018) on nurses at Cibinong Bogor Regional Hospital with a Cronbach's Alpha value of 0.79 and validity of 0.89 (Rizky, 2018; Setyowati & Chung, 2021).
- Consists of 19 questions with scores ranging from 0-3, for a total score of 0-21. A score above 5 indicates poor sleep quality.

c. Workload Questionnaire

- Uses the NASA-TLX instrument developed by Sandra Hart and Lowel E. Staveland.
- Validity and reliability in Indonesian tested with a validity value of 0.857 and reliability of 0.921 (Destiani et al., 2020).
- Workload is categorized as moderate (<80) and heavy (>80).

d. Job Stress Questionnaire

- It uses the Expanded Nursing Stress Scale (ENSS), which is highly valid and reliable, with a Cronbach's alpha value of 0.96.
- Translated and validity tested by Harsono (2024) on nurses in South Jakarta with r values ranging from 0.362 to 0.793 and a Cronbach's alpha of 0.939.
- Consists of 54 questions divided into 8 subscales. Job stress is categorized as moderate (0-114) and severe (115-228).

e. Coping Strategies Questionnaire

- Uses Brief-COPE, a short version of the COPE Inventory.
- Validity and reliability in Indonesian tested by Huda et al. (2022) with a Cronbach's alpha value of 0.825.
- Measures three dimensions: emotion-focused coping, problem-focused coping, and dysfunctional coping, with 14 subdimensions consisting of 28 items.

2.2 Processing and Analyzing of Data

Data was collected using questionnaires and went through the stages of re-examination, coding, data tabulation, and data checking. Data analysis was conducted to address the research problems using SPSS software version 25. Three types of data analysis were used in this study: univariate, bivariate, and multivariate analysis.

Univariate analysis was used to illustrate the characteristics of each research variable. Each variable was analyzed individually to obtain a general overview of the collected data.

Bivariate analysis was used to examine the link between two variables, namely the independent variables (workload, job stress, sleep quality, coping strategies) and the dependent variable (work fatigue). In this study, Spearman's correlation test was used because the data was categorical. A significance value of <0.05 indicates a relationship. The correlation coefficient value between -1 and +1 was used to measure the strength and direction of the relationship between variables, with correlation categories ranging from very weak to very strong.

Multivariate analysis was conducted to analyze the influence of the independent variables on the dependent variable together and to determine which independent variable most dominantly affects the dependent variable. Since the collected data is categorical, the statistical test used was logistic regression analysis with data interpretation based on a p-value <0.25. This analysis is essential to understand which independent variables have the most significant influence on the dependent variable.

3. RESULT AND DISCUSSION

Hermina Hospital Manado is a Type C General Hospital located at Ring Road 2 Street, Lingkungan 1, Kelurahan Paniki Bawah, Mapanget region, Manado city. This hospital is the 38th branch of PT Medika Loka Hermina Tbk and was inaugurated on July 25, 2020, with operational permit number 354/1570/4/IORSA/DPMPTSP/VII/2020.

Hermina Hospital Manado prioritizes maternal and child services and has been accredited at the paripurna level according to the Ministry of Health's Accreditation Standards (STARKES) in 2022. Available facilities include emergency services, outpatient care, inpatient care, intensive care units, medical support services such as pharmacy, laboratory, medical records, radiology, and general facilities such as a prayer room and café. The medical staff at Hermina Hospital Manado consists of 13 general practitioners, 48 specialists, 87 nursing staff, and 29 other healthcare workers.

Characteristics of Research Respondents

This study involved 63 respondents with the following characteristics:

1. Age of Respondents: The median age of respondents is 26, with an age range between 22 and 35.
2. Gender: Of the 63 respondents, 14 (22.2%) are male and 49 (77.8%) are female.
3. Marital Status: A total of 45 respondents (71.4%) are unmarried, 17 respondents (27.0%) are married, and 1 respondent (1.6%) is divorced.
4. Education Level: A total of 13 respondents (20.6%) have a diploma (D3) as their highest education, while 50 respondents (79.4%) have a bachelor's degree (S1) as their highest education.

3.2 Univariate Analysis

The results of the univariate analysis describe the characteristics of each research variable that has been studied, including work fatigue variables, sleep quality variables, workload variables, work stress variables, and coping strategy variables.

Table 1. Distribution of Respondents Based on Work Fatigue, Sleep Quality, Workload, Job Stress, and Coping Strategies

Variable	Category	Frequency (n)	Percentage (%)
Work Fatigue	Medium	44	69,8
	High	19	30,2
	Total	63	100,0%
Sleep Quality	Medium	24	38,1
	High	39	61,9
	Total	63	100,0
Workload	Medium	27	42.9
	High	36	57,1
	Total	63	100,0%
Job Stress	Medium	40	63,5
	High	23	36,5
	Total	63	100,0
Coping Strategy	Problem-based coping	9	14,3
	Emotional-based coping	54	85,7
	Total	63	100,0

Based on Table 1, the overview of respondents shows that out of 63 nurses, 44 (69.8%) experienced moderate work fatigue, and 19 (30.2%) experienced high work fatigue. Sleep quality is also a concern, with 24 nurses (38.1%) having good sleep quality and 39 nurses (61.9%) having poor sleep quality. In terms of workload, 27 nurses (42.9%) experience a moderate workload, and 36 nurses (57.1%) experience a heavy workload. The job stress experienced by respondents also varies, with 40 nurses (63.6%) experiencing moderate job stress and 23 nurses (36.5%) experiencing high job stress. Lastly, regarding the coping strategies used, 9 nurses (14.3%) use problem-based coping, while 54 nurses (85.7%) use emotional-based coping.

3.3 Bivariate Analysis

Bivariate analysis is employed to explore the connection between two variables, the independent and dependent variable, using Spearman's correlation test.

Table 2. Relationship Between Sleep Quality and Work Fatigue

Variable	Correlation Coefficient	Sig
Sleep Quality * Work Fatigue	0,444	0,000

Based on Table 2, it can be seen from the Sig value of 0.000 < 0.05, which means there is a significant relationship between sleep quality and work fatigue. The correlation coefficient value of 0.444 indicates a moderate strength and a positive direction of the relationship. Nurses who experience poor sleep quality tend to experience higher work fatigue.

Table 3. The Relationship Between Workload and Work Fatigue

Variable	Correlation Coefficient	Sig
Workload * Work Fatigue	0,429	0,000

Based on Table 3, it can be seen from the Sig value of 0.000 < 0.05, which means there is a significant relationship between workload and work fatigue. The correlation coefficient value

of 0.429 indicates a moderate strength and a positive direction of the relationship, meaning that the higher the workload, the higher the work fatigue of the nurses, and vice versa.

Table 4. The Relationship Between Job Stress and Work Fatigue

Variable	Correlation Coefficient	Sig
Job stress * Work Fatigue	0,507	0,000

Based on Table 4, it can be seen from the Sig value of 0.000 < 0.05, which means there is a significant relationship between job stress and work fatigue. The correlation coefficient value of 0.507 indicates a moderate strength and a positive direction of the relationship. The heavier the job stress experienced by nurses, the higher their work fatigue will be.

Table 5. The Relationship Between Coping Strategies and Work Fatigue

Variable	Correlation Coefficient	Sig
Coping Strategies * Work Fatigue	0,398	0,034

Based on Table 5, it can be seen from the Sig value of 0.034 < 0.05 that there is a significant relationship between coping strategies and work fatigue. The correlation coefficient value of 0.398 indicates a weak strength of the relationship and a positive direction. The coping strategies used by nurses, whether emotional-based coping or problem-based coping, have little influence on the occurrence of fatigue in nurses.

3.4 Multivariate Analysis

This study's multivariate analysis uses logistic regression to determine the most influential factors on work fatigue. The independent variables that meet the criteria for inclusion in the candidate multivariate model are as follows.

Table 6. Bivariate Selection

No	Variable	p - value
1	Sleep Quality	0,000
2	Workload	0,000
3	Job stress	0,000
4	Coping Strategies	0,034

According to Table 6, independent variables with a p-value < 0.25 from the bivariate analysis were incorporated into the multivariate analysis model utilizing the Backward Wald logistic regression technique. It involves entering all candidate variables into the model, then automatically removing each independent variable with a p-value > 0.05 one by one based on statistical significance.

Table 7. Logistic Regression Test Results

Variable	Sig.	Exp(B)
Sleep Quality	0,009	7,485
Workload	0,021	8,287
Job stress	0,019	14,756
Coping Strategies	0,999	0,000

Based on Table 7, the results of the logistic regression test using the *Backward Wald* method show that the independent variable most related to work fatigue among nurses at Hermina Hospital Manado is job stress. The job stress variable has the highest Exp(B) or OR (14.756) with a significance value of 0.021, indicating that job stress can affect work fatigue by 14 times. Other variables affecting work fatigue are workload, with an OR of 8.287 and a significance of 0.021, and sleep quality, with an OR of 7.485 and a significance of 0.009. Meanwhile, the coping strategies variable does not significantly affect work fatigue as the p-value is 0.999 > 0.05.

This study was conducted at Hermina Hospital Manado, involving 63 nurses working in various units such as inpatient care, emergency, intensive care, and outpatient clinics. The majority of respondents were female (77.8%), with an average age of 26 years. Most nurses were unmarried (71.4%), indicating challenges related to work schedules and potential fatigue. Age and marital status affect health conditions and work fatigue levels, consistent with literature showing that age can

increase the risk of work-related health problems (Ellis, 2018).

The research results indicate a significant relationship between sleep quality and work fatigue, its Sig value is 0.000 and a correlation coefficient is 0.444, suggesting that improving sleep quality can reduce work fatigue. Other studies support this finding, showing that poor sleep quality is associated with high fatigue and poor health among nurses. (Dimkatni et al., 2020; Feby Surantri et al., 2022; Hosona & Uesugi, 2023).

Sleep quality plays a crucial role in both physical and mental health because sleep enables the body to recover and rest after daily activities, reduces stress and anxiety, and enhances concentration for daily activities. (A. Allo & Yanti, 2022). Poor sleep quality not only impacts the health of nurses but also patient safety (Segon et al., 2022; Tarwaka, & Bakri, 2014).

Furthermore, this research discovered a notable association between workload and work fatigue, evident from a Sig value of 0.000 and a correlation coefficient of 0.429. Other research supports that heavy workloads increase work fatigue, indicating that workload management is crucial to reducing fatigue (Dimkatni et al., 2020; Lestari, Jingga, & Wahyudiono, 2023; Pongantung et al., 2018). Nurses often experience heavy workloads and have to handle tasks beyond their primary roles, such as administrative and management duties, which increases the risk of fatigue.

Job stress was also found to have a significant relationship with work fatigue, with a Sig value is 0.000 and a correlation coefficient is 0.507. This finding is consistent with research indicating that high job stress can lead to physical and mental fatigue, disrupting the health and well-being of nurses (Ardian, 2019; Jalilian et al., 2019; Oktariani et al., 2022). Job stress often arises from job demands that are unbalanced with individual capabilities, which can affect work efficiency and productivity (Mulfiyanti et al., 2020).

Stress responses can also impact health and physiological disruptions in the body. Physiological changes that occur when the body experiences stress is mediated by cortisol hormones produced by the HPA axis. *Cortisol* is a stress hormone that increases muscle, cardiovascular, respiratory, endocrine, and nervous system activity. Increased muscle activity leads to more accumulation of lactic acid, which can cause fatigue (Oktariani et al., 2022).

This study also demonstrates a relationship between coping strategies and work fatigue, the Sig value is 0.034 and a correlation coefficient is 0.268. The coping strategy most commonly used is emotional-based coping, mainly through spiritual support (Al-Ruzzieh & Ayaad, 2021; Al Barmawi et al., 2019). Nursing managers are advised to create a supportive work environment and provide coping training programs to enhance the quality of work and the well-being of nurses (Abou Hashish & Ghanem Atalla, 2023; Jilou et al., 2021).

The multivariate analysis found that work stress was the most dominant variable affecting work fatigue, followed by workload and sleep quality. Work stress is often caused by excessive workloads and issues with patients, which can result in physical and mental fatigue (Ardian, 2019; Tarwaka, 2015). Nurses who work 16-hour night shifts have a more challenging time reducing stress and work-related fatigue (Hosona & Uesugi, 2023). Sufficient rest and recovery are crucial to reducing fatigue and maintaining health and work efficiency (Suma'mur, 2014).

CONCLUSSION

This study indicates a moderate correlation between sleep quality and work fatigue among nurses at Hermina Hospital Manado, suggesting that better sleep quality tends to reduce work fatigue. Additionally, a moderate correlation was also found between workload and work fatigue, indicating that higher workloads lead to increased levels of fatigue among nurses. The moderate correlation between work stress and work fatigue reinforces the finding that work stress is a significant factor contributing to fatigue. On the other hand, coping strategies show a weak correlation with work fatigue, indicating that how nurses cope with stress does not have a strong influence on their fatigue levels. From

the multivariate analysis, the most dominant variable affecting work fatigue among nurses at Hermina Hospital Manado is work stress, highlighting the importance of effective stress management in reducing work fatigue among nurses.

SUGGESTION

Future researchers could conduct studies with larger samples and consider other factors such as tenure, work environment, and time management, using more in-depth research designs such as longitudinal studies. Management can support efforts to reduce nurse fatigue by implementing rotating shift schedules and limiting overtime to no more than 16 hours. Additionally, providing stress management training would be beneficial. Nurses are also encouraged to improve their sleep quality and actively participate in stress management training to mitigate the impact of work fatigue.

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