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WORK FATIGUE OF OPERATING ROOM NURSES AND ITS CORRELATION WITH SLEEP QUALITY

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Abstract

Work fatigue in operating room nurses is a critical issue that affects nurse performance and patient safety. Nurses who are exhausted show symptoms such as reduced activity levels, decreased motivation, sleep disturbances and difficulty concentrating. This condition has an impact on the quality of work of operating room nurses and is dangerous for patients. The purpose of this study to analyze the relationship between work fatigue and sleep quality among operating room nurses. This quantitative study utilized a correlational design, involving 20 respondents selected through a total sampling technique, comprising all operating room nurses at Karsa Husada Hospital Batu. Data analysis was conducted using a Spearman Rank Correlational test. The study found moderate levels of work fatigue and poor sleep quality among the participants. There is a significant relationship between work fatigue and sleep quality, with a p-value of 0.001 and r = 0.682, indicating a strong and positive correlation. This means that increased work fatigue resulting in poor sleep quality. Excessive activity in operating room nurses leads to work fatigue, resulting in poor sleep quality. It is recommended that operating room management adjust shift schedules according to worker capacity and provide adequate rest periods to reduce fatigue and improve sleep quality

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INTRODUCTION

Nurses are one of the health workers who are at risk of experiencing sleep quality disorders in fulfilling their basic needs. Nurses in Indonesia have a prevalence of sleep quality disorders due to stress and workload of 59.4% - 84.62% (1). Based on the results of research at Depok City Hospital, a total of 98 nurses (56.3%) had poor sleep quality and had EDS (excessive daytime sleepiness) (2)

The quality of nurses' sleep is the most important thing that must be considered, if the quality of sleep deteriorates, it will reduce the quality of care and patient satisfaction, and increase errors in health care (3). Sleep quality decrease has an impact on various aspects of cognitive function and individual well-being. Concentration levels, changes in cognitive abilities, anxiety, as well as reduced overall well-being are the result of decreased sleep quality. (4)

Research by Triwijayanti reported that 61.4% of inpatient nurses experienced sleep disturbances and 56.1% were found to have poor work performance. (5) A statistically significant correlation was observed between sleep problems and

performance ($\rho = 0.035$; $p < 0.05$), suggesting that inadequate sleep may contribute to decreased clinical performance. This happens because the environment in the operating room requires a high level of accuracy and concentration so that it is at risk of high stress and fatigue (2)

Sleep problems among nurses have been widely studied, but little attention has been given specifically to operating room (OR) nurses. The operating room environment is particularly demanding, requiring high accuracy, sustained concentration, and long working hours, which may lead to elevated stress and fatigue. These conditions make operating room nurses

especially vulnerable to sleep disorders, yet this population remains underrepresented in the literature (1)

The tasks and responsibilities of operating room nurses are divided into Scrub Nurse (instrument nurse) and Circulating Nurse (circulation nurse) (6). The main task of the instrument nurse (Scrub Nurse) is to keep the tools/instruments sterile during the action, organize the instruments in accordance with the sequence of operating procedures, and various responsibilities in the operation until it is completed (7). Circulating nurses have duties including meeting additional needs during surgery (instruments & medical devices), ensuring patient position, adjusting room temperature and lighting (8)

Based on the researcher's experience that serving as an instrument nurse can be at risk of fatigue due to being required to stand for a long time, namely 1-3 hours / more according to the difficulty of the operation, while circular nurses with demands for tasks in and out of the room to meet the needs of the surgical team that have not been fulfilled create a risk of fatigue. The relationship between sleep quality and fatigue is evidenced by Permatasari's research, which obtained a Chi Square test value with a p-value of 0.005 and r=0.609, indicating a strong relationship between fatigue and sleep quality (6)

Researchers have accessed Google Scholar to search for reference journals. But of the ten journals obtained, none specifically focused on examining the sleep quality of nurses in the operating room in relation to work fatigue. The operating room is a high-risk environment that requires constant alertness and focus, as nurses play a critical role in supporting complex surgical procedures, handling sterile instruments, and responding promptly to changes in the patient's condition. (7) Work fatigue in this setting may lead to reduced concentration, impaired decision-making, and slower response times, all of which directly increase the risk of patient harm.

This suggests that, despite its clinical importance no previous studies have specifically examined the relationship between work fatigue and sleep quality in operating room nurses in the Indonesian context. Therefore, this study aims to analyze the relationship between occupational fatigue and sleep quality, specifically among nurses working in the operating room at Karsa Husada Batu Hospital.

METHODS

This study used an observational method with a correlational design. The purpose of the study was to analyze the relationship between work fatigue as an independent variable with sleep quality in operating room nurses. The total sampling technique was used by researchers to determine the sample size, where the number of samples was the same as the population, namely 20 operating room nurses. This research was conducted at IBS RSUD Karsa Husada Batu after obtaining ethical feasibility from KEPK with NO.020/1005/102.13/2024. Because this sample only consisted of 20 participants, the results of this study cannot be generalized to operating room nurses in other hospitals that have different characteristics.

The measuring instruments used in this study were the Subjective Self-Rating Test (SSRT) to assess work fatigue and the Pittsburgh Sleep Quality Index (PSQI) to assess sleep quality. The SSRT, developed by the Industrial Fatigue Research Committee (IFRC) of Japan, consists of 30 items rated on a Likert scale from 1 (Never) to 4 (Very Often). Validity and reliability of the SSRT in the Indonesian context have been confirmed by previous research, with Cronbach's alpha values above 0.6 and item-total correlation coefficients exceeding 0.325 (8). PSQI questionnaire has been translated and validated for use in Indonesia, with a Cronbach's alpha reliability score of 0.721, indicating good internal consistency. These instruments are thus considered appropriate and reliable for measuring the respective variables in this study.(8)

All data collected were processed and analyzed using SPSS. The analysis consisted of univariate and bivariate testing, utilizing the Spearman Rank Correlation test.. For the purpose of univariate analysis, work fatigue scores were categorized into

four levels (9) : low fatigue (30–52), moderate (53–75), high (76–98), and very high (99–120). Sleep quality scores were classified into two categories: (10)

1. Sleep with good quality: 1-5
2. Poor quality sleep: 6-21

RESULTS AND DISCUSSION

A. Univariate Analysis

Table 1 Frequency Distribution f Work Fatigue in Nurses in the Operating Room at Karsa Husada Batu Hospital in March 2024 (n=20)

Variabel	Mean	Minimum-Maximum	CI 95%
Work Fatigue	53,55	32-70	10.684

The table 1 in this research shows that the operating room nurses' job fatigue ranges from 32-70. The average value of respondents is 53.55, which can be concluded that the tendency of respondents to experience moderate work fatigue. Work fatigue is a sign of decreased efficiency and endurance of a person in working mentally and physically

A person's physical condition will decrease if they are involved in too much work during working hours. The results of research at IBS Dr. Kariadi Hospital Semarang stated that out of 101 respondents who had work fatigue, 47 nurses (46.5%) experienced moderate fatigue (11))

In the opinion of the researcher, fatigue in the operating room is a result of increased demands for focus and pressure of work with patients. Instrument nurses are required to concentrate on performing actions in a standing position with a duration of 1-3 hours / more according to the complexity of the operation, while circular nurses are required to go in and out of the room to meet the needs of the surgical team until the operation is complete. If the number of patients is large, the nurse will repeat the operation with the same relative duration and the rest time obtained is also decreasing because it is used to prepare for the next operation, this results in the emergence of work fatigue.

Work fatigue of operating nurses at IBS RSUD Karsa Husada Batu allows for treatment through several ways, namely adjusting physical and mental work capacity, getting a break of approximately 2 hours, and organizing a pleasant work environment by providing food or drinks to be consumed in between breaks.

Table 2 Distribution of Sleep Quality in Nurses in the Operating Room of Karsa Husada Batu Hospital in March 2024 (n=20)

Variable	Frequency	Percentage %
Sleep Quality		
Good	4	20
Bad	16	80

Based on Table 2 shows that almost all of the respondents had poor sleep quality as many as 16 people with a percentage of 80%. Assessment of the quality of sleep of operating room nurses using the PSQI questionnaire which contains 7 aspects, namely sleep duration, sleep quality (subjective assessment of how good sleep is obtained), sleep disturbance, sleep latency (the time it takes to fall asleep after lying in bed), sleep efficiency, use of sleeping pills, daytime dysfunctions (12) . The study found that 73.3% of nurses in Sanglah Hospital's pediatric inpatient intensive room had poor sleep quality and 26.7% of nurses had good sleep quality. poor sleep quality and 26.7% of nurses with good sleep quality. (2) This finding supports the pattern observed in this study.

Researchers found that 80% of operating room nurses in this study had poor sleep quality. Although this figure highlights a significant issue, it is important to consider potential biases in interpretation. Given the small sample size (n=20) and the use of a self-reported instrument such as the PSQI, responses may be influenced by individual perceptions, current workload, or recall bias. These factors may limit the objectivity of the results and should be acknowledged when drawing broader conclusions.

Despite these limitations, the high rate of poor sleep quality remains concerning. It may affect nurses' alertness, decision-making, and performance, potentially compromising patient safety. Ongoing sleep disturbances also raise risks of fatigue and health problems. These results point to the need for interventions focused on schedule regulation, stress reduction, and promoting healthy sleep habits in high-pressure settings (13)

Table 3 Cross tabulation of age and gender factors with Work Fatigue in Nurses in the Operating Room at Karsa Husada Batu Hospital in March 2024 (n=20)

Variable	Sleep Quality				Total
	Good		Bad		
Work Fatigue	**f**	**%**	**f**	**%**	
Low	6	30	9	45	100
Moderate	0	0	1	5	

Based on Table 3, it is known that work fatigue occurs mostly in the age group of 26-35 years and only a few experiences work fatigue at the age of more than 35 years. Based on gender, female experience more moderate levels of fatigue than male. Work fatigue will be more pronounced at the age of 25 years and above. Muscle strength tends to increase until the age of 25, but will experience a drastic decline reaching 75%-80% when it reaches the age of 65 (14) At that age, individuals tend to have high work enthusiasm and are very productive so that maximum muscle exertion occurs which can cause fatigue

Female have more severe work fatigue than male because they only have about two-thirds of the physical strength of male, so they tend to feel tired faster (15) Previous research stated that there was a relationship between gender and work fatigue, based on the P value = (0.000) < (α = 0.05) (15). The level of fatigue and risk of muscle injury is also influenced by gender, because physiologically and biologically there are differences in muscle strength and flexibility, female have greater muscle strength due to hormonal differences and genetics, while female have higher flexibility which can affect the way muscles and joints function to the risk of injury (14)

The study found that age and gender are interrelated with job fatigue, where older age allows for more experience and better coping strategies in terms of job fatigue and job stress. The average female nurse also tends to have lower stamina than males, because muscle mass is greater than female and the hormone testosterone in male plays an important role in muscle development and physical strength.

Table 4 Cross tabulation of Work Fatigue factors with Sleep Quality of Nurses assigned to the Operating Room at Karsa Husada Batu Hospital in March 2024 (n=20)

In table 4, most nurses have moderate job fatigue with poor sleep quality, 11 people (100%).

The Factors of Effect	Work Fatigue				Total	
	Low		Medium			
	f	**%**	**f**	**%**	**f**	**%**
Age						
26-35	**6**	**30**	**9**	**45**	**15**	**100**
36-45	**0**	**0**	**1**	**5**	**1**	
46-55	**3**	**3**	**1**	**5**	**4**	
Gander						
Male	**9**	**45**	**5**	**25**	**14**	**100**
Female	**0**	**0**	**6**	**30**	**6**	

B. Bivariate Analysis

Table 5. Cross tabulation of Work Fatigue factors with Sleep Quality of Nurses assigned to the Operating Room at Karsa Husada Batu Hospital in March 2024 (n=20)

Variable	Correlation Value	p-value	Conclusion
Work Fatigue Sleep Quality	0.682	0.001	p-value (0,001) < α (0,05)

Based on table 5, it is known that the p value (0.001) < α (0.05), thus H1 is accepted, which means that there is a significant relationship between work fatigue and the quality of sleep of operating room nurses. The r value shows a strong relationship level of 0.682 and the r value is positive, meaning that the higher the work fatigue of nurses in the operating room, the worse the sleep quality.

Sleep quality is influenced by complex interactions between work fatigue, circadian rhythms, and hemostatic factors. Excessive fatigue increases the hemostatic requirement for sleep. If this need is not met due to work stress or sleep disturbance, sleep quality will decline. Work-stress can disrupt circadian rhythms through hormonal and stress mechanisms. For example, night work or shift work can disrupt the natural sleepwake rhythm, leading to sleep disturbances (13)
Low sleep quality due to circadian and hemostatic disturbances can reduce work performance, increase the risk of accidents, and lead to long-term health problems such as chronic sleep disorders. In line with Permatasari's research, the results of a strong correlation between work fatigue and sleep quality of internal medicine unit nurses at Sekarwangi Sukabumi Hospital using Pearson's R test obtained a value of 0.609. (16) Juliana's research results also support that there is a relationship between sleep quality and work fatigue using the Chi-square test p-value = 0.001. (17). Researchers believe that fatigue experienced by individuals can accelerate the process of falling asleep, because the slow wave stage (NREM) is shortened and the REM cycle will be longer in order to compensate for sleep needs and maintain the balance of energy that has been expended. However, there are side effects of excessive physical activity, namely the risk of stress, a constantly working mind, irregular working hours, lack of leisure time, physical fatigue, and caffeine use. These problems interfere with the body and mind's ability to relax and sleep well.

CONCLUSION

There is a significant relationship between work fatigue and sleep quality among operating room nurses. This highlights the importance of hospital management in designing appropriate work schedules to minimize fatigue and improve sleep quality. Management may consider shift patterns or increasing staffing levels, particularly in operating rooms, to prevent excessive workload. Addressing these issues is essential to maintain nurse performance and ensure patient safety in high-pressure clinical settings.

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