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The Effect of Night Shift Work on Nurses' Fatigue and Work Concentration in the Emergency Department

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ABSTRACT

Shifts are part of the work scheduling system in 24-hour hospitals, including the Emergency Department (ER). Night shift work can potentially cause physical and mental fatigue and reduce nurses' concentration, which can impact the quality of care and patient safety. This study aims to analyze the effect of night shifts on nurses' fatigue levels and concentration in the ER of X Regional General Hospital.

The study used a quantitative correlational design with a cross-sectional approach. A purposive sample of 60 nurses was selected, with at least 6 months of work experience in the ER and willingness to participate in the study. Data were collected using a Modified Variable Response Questionnaire (MOQ) Fatigue Impact Scale (MFIS) to measure fatigue and Work Concentration Scale (WCS) for work concentration. Data analysis used Pearson correlation with a significance level of $\alpha = 0.05$.

The results of the study showed a significant positive relationship between night shift work and nurse fatigue levels ($r = 0.68$; $p < 0.05$) and a significant negative relationship between night shift work and work concentration ($r = -0.62$; $p < 0.05$). This indicates that the more frequently nurses work night shifts, the higher their fatigue levels and the lower their work concentration.

In conclusion, night shifts increase fatigue and decrease concentration among nurses in the emergency department. Equitable shift schedules and fatigue management programs are recommended to maintain nurse performance and service quality.

Keywords: Night Shift, Fatigue, Work Concentration, Nurses, Emergency Room

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1. Introduction

Shift work is a form of work scheduling implemented in various healthcare services, particularly in 24-hour Emergency Departments (ERs). This work system aims to ensure the smooth running of healthcare services, but it has consequences for the physical and psychological well-being of nurses. Nurses who work night shifts often experience circadian rhythm disruption, physical and mental fatigue, and decreased concentration, which can impact performance and patient safety (Åkerstedt & Wright, 2009).

Work fatigue is a state of exhaustion experienced due to repeated physical, mental, and emotional stress during work. This fatigue not only reduces work performance but also increases the risk of errors in clinical decision-making (Caruso, 2014). Meanwhile, work concentration is an individual's cognitive ability to focus attention and maintain alertness to the task at hand. Decreased concentration can impact the effectiveness of care and patient safety in the emergency department (Smith et al., 2014). et al., 2020).

Several studies have shown that night shifts are closely associated with increased fatigue and decreased concentration in nurses. For example, Zhang & Chen (2019) found that nurses working night shifts have a higher risk of chronic fatigue and cognitive impairment. This underscores the need for further research to understand the impact of night shifts on nurse performance, particularly in the emergency department (ED), which is a critical care unit.

Based on the description above, this study aims to analyze the effect of night shift work on nurses' fatigue and concentration in the emergency department (ED). This research is expected to provide useful information for hospital management in designing a more effective shift work system that addresses nurses' physical and cognitive health.

2. Research Method

a) Research Design

This study used a quantitative correlational design with a cross-sectional approach. This design was chosen to determine the relationship between night shift work and nurses' levels of fatigue and work concentration at the time of the study.

b) Population and Sample

The study population was all 80 nurses working in the Emergency Room (IGD) of X Regional General Hospital. A sample of 60 nurses was taken using a purposive sampling technique, namely nurses who met the following inclusion criteria:

- 1) Work in the ER for at least 6 months.
- 2) Have worked night shifts at least 3 times in the last month.
- 3) Willing to participate in research and sign *informed consent*.

c) Research Variables

1. Independent variables: Night shift, namely the nurse's work schedule which takes place at night (20.00–08.00).
2. Dependent variable:





- Nurses' work fatigue, measured using the *Modified Fatigue Impact Scale* (MFIS).
- Nurses' work concentration, measured using *Work Concentration Scale* (WCS).

d) Research Instruments

1) Modified Fatigue Impact Scale (MFIS):

- Used to assess levels of physical, cognitive, and psychosocial fatigue.
- Consisting of 21 items with a Likert scale of 0–4, the total score is 0–84. High scores indicate high levels of fatigue.

2) Work Concentration Scale (WCS):

- Measures the nurse's ability to focus on work.
- Consisting of 15 items with a Likert scale of 1–5, the total score is 15–75. High scores indicate good work concentration.

e) Research Procedures

- 1) The researcher obtained permission from the management of RSUD X and ethical clearance from the research ethics committee.
- 2) Questionnaires were distributed to nurses at the end of the night shift to ensure conditions were relevant to the research variables.
- 3) The researcher provided an explanation of the research objectives and how to fill out the questionnaire.
- 4) The questionnaire was collected anonymously to maintain data confidentiality.

f) Data analysis

1. Descriptive Statistics:

- Used to describe respondent characteristics such as age, gender, length of work experience, average fatigue and concentration scores.

2. Inferential Statistics:

- Normality test was performed using Shapiro-Wilk.
- The relationship between night shift work and fatigue and work concentration was analyzed using Pearson correlation.
- The significance level was set at $\alpha = 0.05$.

g) Research Flow:

1. Preparation of research instruments and permits.
2. Recruitment of respondents according to inclusion criteria.
3. Completion of the MFIS and WCS questionnaires by respondents.
4. Data collection and validation.
5. Statistical analysis using SPSS version 25.
6. Interpretation of results and preparation of research reports.

3. Results And Discussions





a. Results

1. Respondent Characteristics

Table 1. Respondent Characteristics

Characteristics	Frequency (n=60)	Percentage (%)
Age (years)		
20–25	18	30
26–30	25	41.7
31–35	12	20
>35	5	8.3
Gender		
Woman	48	80
Man	12	20
Length of Work Experience		
6–10 months	10	16.7
1–3 years	22	36.7
4–6 years	18	30
>6 years	10	16.6

2. Variable Description

Table 2. Average Scores of Fatigue and Work Concentration

Variables	Average Score	Standard Deviation	Category
Fatigue (MFIS)	56.3	8.4	Tall
Concentration (WCS)	42.7	6.2	Currently

From the table above, it can be seen that most nurses experience high levels of fatigue during night shifts, while work concentration is in the moderate category.

3. Correlation Analysis

Table 3. Relationship between Night Shift Work and Fatigue and Work Concentration

Variables	r	p -value	Connection
shift → Fatigue	0.68	0,000	Significant positive
shift → Concentration	-0.62	0,000	Significant negative

The results of the analysis show:





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1. Significant positive correlation between night shifts and fatigue: The more often nurses work night shifts, the higher the level of fatigue.
 2. Significant negative correlation between night shifts and work concentration: The more often nurses work night shifts, the more their work concentration tends to decrease.
- These results indicate that night shifts affect the physical and cognitive conditions of nurses, so a good shift management strategy is needed to minimize fatigue and maintain work concentration.

b. Discussion

The results of this study indicate that night shift work significantly affects nurses' fatigue and work concentration in the Emergency Department (ER). Correlation analysis showed a significant positive relationship between night shift work and fatigue ($r = 0.68$; $p < 0.05$) and a significant negative relationship between night shift work and work concentration ($r = -0.62$; $p < 0.05$). This finding is in line with previous studies that confirmed the impact of night shift work on the physical and cognitive health of healthcare workers (Caruso, 2014; Zhang & Chen, 2019).

1) Night Shifts and Fatigue

Nurses who work night shifts are prone to circadian rhythm disruption, which impacts sleep quality and energy levels. Åkerstedt & Wright (2009) state that shifts in sleep patterns due to night shifts can increase the risk of chronic fatigue. This fatigue not only affects physical performance but also mental health, mood, and work motivation. In the emergency department (ED), the dynamic work environment and the demands of responding to emergencies further exacerbate nurse fatigue.

2) Shifts and Work Concentration

Work concentration is the cognitive ability to focus attention on complex tasks. Research shows that night shifts reduce nurses' work concentration levels. This decreased concentration can increase the risk of clinical errors, delays in responding to critically ill patients, and decrease the quality of communication between medical teams (Smith et al. al., 2020). This occurs because physical and mental fatigue reduces attention capacity, working memory, and decision-making.

3) Practical Implications

Based on these findings, hospital management needs to consider strategies to reduce the negative impacts of night shifts, including:

- Fair shift rotation: Alternating night shifts so that nurses do not have to work consecutive night shifts too often.
- Fatigue management program: Provides training in relaxation techniques, light exercise, and education about quality sleep.
- Nurse health monitoring: Conducting regular check-ups to identify nurses at risk of chronic fatigue and cognitive impairment.





4) Research Limitations

This study has several limitations, including:

- a) Using a cross-sectional design so that it only shows relationships, not cause and effect.
- b) Fatigue and concentration data were obtained through self-report questionnaires, which may be influenced by respondents' subjective perceptions.
- c) Other variables such as work stress, patient load, and the physical environment of the ER were not analyzed, even though they can affect fatigue and work concentration.

Taking these limitations into account, further research is recommended to use longitudinal or experimental designs to obtain stronger evidence of causality, as well as adding work environment variables and job stress as additional factors.

4. Conclusion and Suggestion

a. Conclusion

Based on the research results, it can be concluded that:

- 1) Shifts significantly increase nurse fatigue levels in the Emergency Department (ER). The more frequent night shifts nurses work, the higher their perceived fatigue levels.
- 2) Shifts significantly reduce nurses' concentration. The more frequently nurses work night shifts, the lower their concentration tends to be, which can impact the quality of care and patient safety.

b. Suggestion

1. For Hospital Management:

- Establish a fair and alternating work shift schedule so that nurses do not have to work consecutive night shifts too often.
- Provides fatigue management programs, including relaxation training, light exercise, and quality sleep education.
- Conduct routine monitoring of nurses' physical and psychological health to detect chronic fatigue and cognitive impairment.

2. For Nurses:

- Implement good sleep and rest time management, maintain a diet, and do light physical activity during night shifts to reduce fatigue.
- Increase awareness of the importance of work concentration, including focus strategies when working in a dynamic ER environment.

3. For Further Researchers:





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- It is recommended to conduct research with a longitudinal or experimental design to determine a clearer cause-and-effect relationship between night shifts, fatigue, and work concentration.
- Adding work environment variables, work stress, and patient burden as additional factors that may influence research results.

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