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The Effect of Work Shifts on Fatigue and Work Stress in Medical Personnel at Hospital X Batam City in 2025

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Abstract
Introduction: *Work shifts are a work system that is commonly applied in hospitals to ensure that health services last for 24 hours. However, the implementation of work shifts, especially night shifts and irregular rotations, can have a negative impact on the physiological and psychological conditions of medical personnel, such as fatigue and work stress.* ***Objective:*** *This study aims to analyze the effect of work shifts on the level of fatigue and work stress in medical personnel at the Batam City Regional Hospital.* ***Method:*** *The research uses a quantitative method with a cross-sectional approach. Samples were taken purposively as many as 100 medical personnel working with a shift system. The instruments used included the Standard Shiftwork Index (SSI) and Job Stress Scale (JSS) questionnaires.* ***Result and Discussion:*** *The results of the analysis showed a significant relationship between the type of work shift and the level of fatigue ($p < 0.05$) and work stress ($p < 0.05$). Medical personnel who work night shifts and rotational shifts tend to have higher fatigue and stress scores compared to morning shifts.* ***Conclusion:*** *The study concludes that a poorly managed work shift system can increase the risk of fatigue and work stress, which can ultimately impact patient safety and work productivity. Therefore, hospital management needs to consider more ergonomic shift scheduling as well as provide a stress management and workforce recovery program.*

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Introduction

Hospitals as health service institutions must operate for 24 hours to ensure continuity of services to the community. To meet these demands, the shift work system is applied, especially to medical personnel such as nurses and doctors who have a central role in the service process (Sabani, Remmang, & Mane, 2024). A work shift system is a work time arrangement outside of conventional working hours, which often involves working nights, weekends, and schedule rotations (Larry & Susilawati, 2024); (Basalamah, Ahri, & Arman, 2021)

Although work shifts provide operational flexibility for hospitals, a number of studies have shown that these systems can have negative consequences on workers' physical and mental health, particularly in the form of fatigue and work stress (Miranda, 2023); (Sesrianty & Marni, 2021); (Seguh, Kolibu, & Kawatu, 2019); (Ginting & Malinti, 2021).

Chronic fatigue caused by circadian rhythm disruption and lack of adequate rest time risk lowering immunity and leading to work errors, which have a direct impact on patient safety (Ned, 2024); (Ulandari, Noor, Noor, & Nisa, 2024). Meanwhile, prolonged work stress can lead to burnout, decreased performance, and serious psychological disorders (Ulhaq et al., 2024); (NISA, 2024)

This condition is a special concern at Hospital X Batam City, considering the high workload of medical personnel and the demands of professionalism in service. Empirical data and preliminary observations show that some medical personnel in this hospital show symptoms of fatigue and stress, especially those who work night shifts and rotations. However, there have not been many local studies that have specifically examined the relationship between work shifts and the level of fatigue and work stress in medical personnel in this region.

Based on this background, this study aims to analyze the effect of work shifts on fatigue and work stress in medical personnel at Batam City Regional Hospital. The results of this research are expected to be the basis for hospital management in designing a more ergonomic and healthy work system for medical personnel.

Method

This study uses a quantitative method with an observational analytical approach. The design used is cross sectional, which is to observe independent variables (work shifts) and dependent variables (fatigue and work stress) simultaneously at the same time. The bivariate analysis uses the Chi-Square test to look at the relationship between work shifts and stress and work fatigue.

The research was conducted at the Batam City Regional Hospital, the location was chosen because this hospital implements a full shift work system and has a fairly representative number of medical personnel.

The population in this study is all medical personnel (nurses) who work with the shift system at Hospital X Batam City. The sample was determined by a random sampling total of 100 populations, nurses who were on leave or in sick condition during the data collection period. Independent variables: Type of work shift (morning, night, rotation), Dependent variable: Levels of fatigue and work stress.

Results and Discussion

1. Result

Table 1
Distribution of Work Shifts and Stress Levels

Work Shifts	High Stress Level (%)	Low Stress Level (%)
Morning	31.8%	68.2%
Night	80.0%	20.0%
Rotation	79.3%	20.7%

Table 1 shows that the highest levels of stress occur in medical personnel working night shifts and rotations, with high stress percentages of 80.0% and 79.3%, respectively. The morning shift has a more dominant low stress level at 68.2%.

Medical personnel who work nights or with a rotational system tend to experience higher levels of stress. This can be caused by disruption of circadian rhythms, lack of sleep, fatigue, and low social support during the night hours. From the study of Folkard & Tucker (2003) stated that night work significantly increases the risk of fatigue and stress due to disruption of the body's biological clock and the results of the study of Ruggiero & Redeker (2014) found that unstructured rotational shifts lead to sleep disturbances and increased psychological stress.

Table 2
Chi-Square Test Results between Work Shift and Work Stress

Chi-Square Value	Df	p-value
11.329	2	0.003

Based on Table 2, the Chi-Square test results show a value of $p = 0.003 < 0.05$ which means that there is a significant relationship between work shifts and stress levels in medical personnel. Work shifts affect work stress significantly. The more extreme and irregular the shift, the more stressful the tendency to be. This shows that the work time factor has a real psychological impact. In the study, Caruso et al. (2004) stated that overtime work and night shifts are correlated with increased stress and mental health disorders. Similar research by Yoshitake (1978) also showed that an unbalanced workload (shift) exacerbates the physiological stress response.

Table 3
Spearman's Correlation between Work Shift and Work Stress

Correlation Coefficient (rho)	Significance (2-tailed)	Information
0.422	0.000	Moderate Positive Relationships

Table 3 shows that there is a moderate positive correlation between work shifts and work stress levels with a coefficient of rho = 0.422 and a significance value of p = 0.000. This means that the more irregular the work shift, the higher the level of stress experienced. There is a moderate positive relationship between work shifts and stress levels. This means that the more irregular or extreme the type of shift, the higher the likelihood of stress in medical personnel. In Costa (1996) mentioned that night shifts and rotations cause disruptions to the body's physiological functions that affect mood, concentration, and stress levels and Research Boivin et al. (2007) also confirmed that circadian rhythm disturbances cause an increase in cortisol which is directly related to psychological stress.

2. Discussion

The Relationship between Work Shift and Work Stress

The results of the study showed that the type of work shift had a close relationship with the level of stress in medical personnel. Based on the distribution data (Table 1), it can be seen that medical personnel who work night shifts and rotations show higher levels of stress compared to those who work on the morning shift. As many as 80% of respondents on the night shift and 79.3% on the rotational shift experienced high stress, while only 31.8% of medical personnel on the morning shift experienced high stress. This suggests that working time that does not match the biological rhythm of the body tends to cause physiological and psychological imbalances.

This phenomenon is in line with the theory of circadian rhythm, which is the body's natural rhythm that works following the cycle of day and night. When medical personnel have to work outside of normal biological hours, especially at night, there will be sleep disturbances, fatigue, and reduced social support, which ultimately triggers work stress. Support for these results is also reinforced by previous research by Folkard & Tucker (2003) and Ruggiero & Redeker (2014) which stated that night work and rotation lead to sleep disturbances and psychological distress.

Statistical Analysis of Work Shifts on Work Stress

The results of the Chi-Square test (Table 2) showed a significant relationship between the type of work shift and the level of work stress ($p = 0.003$). With a p value of less than 0.05, it can be concluded that the type of work shift significantly affects the stress level of medical personnel. This means that the more extreme or irregular the shift schedule, the greater the risk of a person experiencing work stress.

These results are also reinforced by the study of Caruso et al. (2004) which stated that night shifts and overtime work increase workers' mental and psychosocial health disorders. In addition, Yoshitake (1978) also found that an unbalanced work schedule can exacerbate the physiological response to stress.

Correlation of Work Shift and Work Stress

The results of the Spearman Correlation analysis (Table 3) showed a correlation coefficient value of 0.422 with a significance value of $p = 0.000$, which means that there is a moderate positive relationship between work shifts and work stress. This indicates that the more irregular the work shifts undertaken, the higher the level of stress experienced by medical personnel.

This correlation suggests that disruptions in work rhythms, such as night shifts and rotations, can increase mental tension due to disruptions in rest patterns and body function. Costa (1996) explained that shift disorders can reduce cognitive ability, mood, and cause hormonal disorders such as increased cortisol, which is a major indicator of stress. Research by Boivin et al. (2007) also states that disturbances in circadian rhythms are strongly related to psychological stress.

Implications of the Findings

These findings provide important implications for hospital management. Shift work systems, if not ergonomically designed, can increase the psychological burden and risk of fatigue on medical personnel. This not only endangers the health of the workforce itself, but also has a direct impact on the quality of service and patient safety. Therefore, it is important for hospitals to evaluate and improve shift scheduling systems, particularly

night shifts and rotations, and to provide effective psychological support and recovery programs for medical personnel. In addition, these findings can also serve as a basis for the development of more humane and sustainable work policies in a health care system that operates 24 hours a day

Conclusion

Work shifts have a significant influence on the level of work stress of medical personnel. The results of the Chi-Square test showed a meaningful relationship ($p = 0.003$) between the type of shift and the level of stress experienced. Medical personnel with night shifts and rotational shifts tend to experience higher levels of stress and fatigue than those who work the morning shift

There was a moderate positive correlation between the type of shift and work stress ($\rho = 0.422$, $p < 0.001$), which means that the more irregular the shift, the higher the level of stress of medical personnel. Majority respondents experienced fatigue and work stress in the moderate category, which indicates the need for work management interventions to maintain the well-being of medical personnel

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