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Factors Associated with Work Fatigue among Nurses in South Tangerang City Public Hospital

Haris Muzakir [a,1*], Andra Vidyarini [b,2]

[a] Public Health Study Program, Universitas Muhammadiyah Prof. Dr. Hamka, Jakarta, Indonesia
[b] Nutrition Science Study Program, Universitas Muhammadiyah Prof. Dr. Hamka, Jakarta, Indonesia

Corresponding Author: Haris Muzakir (haris.muzakir@uhamka..ac.id)

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ABSTRACT

Work fatigue is a pervasive issue that affects nursing care quality and patient safety in healthcare settings. This study examined the prevalence of work fatigue among nurses and its association with various factors, including age, body mass index (BMI), work tenure, and work shift. This study employed a cross-sectional quantitative approach and was conducted at the South Tangerang City Public Hospital from February to March 2023. A total of 85 nurses participated in this study. The Industrial Fatigue Research Committee (IFRC) instrument was used to measure work fatigue, encompassing general, mental, and physical domains. Workload-related symptoms were assessed using Likert scale-based responses, classifying the respondents into fatigue and non-fatigue groups. The results indicated that 55.3% of the nurses reported experiencing work fatigue. Significant associations were observed between work fatigue and several other factors. Older nurses demonstrated a lower prevalence of work fatigue (PR:0.579; 95% CI:0.415–0.808; p = 0.013), suggesting that age is a protective factor against fatigue. Conversely, nurses with non-normal BMI exhibited a higher prevalence of work fatigue (PR,1.587; 95% CI:1.100–2.291). A longer work tenure was associated with increased work fatigue (PR:1.851, 95% CI:1.298–2.639), possibly due to cumulative stress and physical demands. Furthermore, night-shift nurses experienced higher work fatigue (PR:1.882, 95% CI:1.302–2.721) than day-shift nurses, indicating the disruptive impact of irregular sleep patterns. These findings emphasize the need for healthcare organizations to address work fatigue among nurses. Strategies may include workload management, providing resources for emotional support, and promoting a healthy work environment. Addressing the specific vulnerabilities of younger nurses, individuals with non-normal BMI, and working night shifts is vital for mitigating work fatigue.

1. Introduction

Work fatigue is a significant issue that affects the quality of nursing care and patient safety in healthcare settings. Nurses are responsible for providing continuous care to patients and are required to work long hours and rotate shifts, which can lead to work fatigue [1]. Work fatigue is a state of physical, emotional, and mental exhaustion that results from prolonged exposure to

work demands and can affect nurses' ability to provide safe and effective patient care [2].

Work fatigue can cause nurses to experience difficulty concentrating, making decisions, and communicating with patients and colleagues [3]. It can also lead to increased medical errors, decreased patient satisfaction, and decreased job satisfaction among nurses [4]. Therefore, addressing work fatigue is essential to maintain high-quality nursing care and promote patient safety in healthcare settings.

Research has shown that factors such as workload, work environment, job demands, personal characteristics, and health status can contribute to work fatigue among nurses [5]. Nurses who experience work fatigue are more likely to experience burnout, which can lead to high turnover rates and staffing shortages in healthcare organizations [5]. Therefore, healthcare organizations must recognize the impact of work fatigue on nurses and take steps to address this issue.

Nurses in the health care sector must interact directly with patients, their families, and the community. The duties of nurses in providing nursing care include respecting, paying attention, behaving well, being fair and professional in dealing with patients, and communicating by prioritizing patient feelings [6]. Nurses must professionally perform their duties to provide the best care to all patients without distinguishing one patient from another to assist patients in receiving treatment, and they must always be friendly and supportive.

Nurses must maintain their health to effectively perform their roles. Nurses frequently face challenges owing to fatigue when performing their duties. According to Pongantung et al. [7], fatigue caused by unequal numbers of patients and nurses, as well as the various health conditions of patients, causes nurses to perform additional tasks.

Each patient has different symptoms depending on the level of fatigue. In general, fatigue is associated with a weak physical condition and a lack of enthusiasm for carrying out activities. Fatigue symptoms include headaches, dizziness, difficulty sleeping, and digestive disturbances [8]. According to a 2016 Indonesian National Nurses Association survey, 50.9% of nurses working in four provinces complained of fatigue such as dizziness and lack of rest hours due to workload [9].

According to data from the International Labor Organization [ILO] in 2013, fatigue is a factor in work accidents worldwide, affecting two million workers annually [10]. In 2013, the Ministry of Manpower and Transmigration reported that daily reports of work accidents contributed to an average of 414 incidents caused by fatigue, accounting for 27.8% of all incidents [10].

Worker fatigue can indirectly cause work accidents. The high number of work-related accidents caused by fatigue requires special attention in the workplace to maintain employees' health and safety. Nurse fatigue can affect work activities because it leads to duty-related mistakes [11]. Several symptoms of fatigue in nurses can interfere with work processes, making it difficult for them to focus [12]. Symptoms can increase with minor and major mistakes made by the nurses.

2. Method

This study employs a quantitative research approach with a cross-sectional design. This design involved collecting data at a single point in time from a sample of participants to understand the prevalence and associations of work fatigue among nurses. The research was conducted at the South Tangerang City Public Hospital and took place during the period from February to March 2023. The study population consisted of 145 nurses at South Tangerang City Public Hospital. The Lemeshow formula was used to determine the sample size. The minimum

sample size required was 57 participants. However, additional 25 nurses voluntarily completed the questionnaire, resulting in a total sample size of 85 participants.

This study used the Industrial Fatigue Research Committee [IFRC] instrument to measure fatigue among nurses. The IFRC questionnaire is a method for analyzing subjective worker fatigue that assesses workload based on worker fatigue symptoms using 30 questions[13]. The IFRC questionnaire is a standardized survey that includes several questions on workloads and fatigue symptoms. The IFRC questionnaire assessed workload and perceived fatigue. It evaluates several fatigue-related domains, including general, mental, and physical fatigue. The IFRC survey often asks respondents to rate the intensity or frequency of their fatigue symptoms using a Likert scale or equivalent rating system. Each item was rated subjectively by the respondents depending on how they felt about it. Based on their responses to the questionnaire items, the respondents to the IFRC questionnaire were divided into fatigue and non-fatigue groups [14]. Supporting data such as age, body mass index, work tenure, and work shifts were obtained from respondents who filled out the questionnaire.

A limitation of this study is that the sample size was relatively small, with 85 nurses from a single hospital. This limited sample size may not fully represent the diversity of nursing experience in different healthcare settings, potentially affecting the generalizability of the findings.

3. Results and Discussion

3.1. Results

Table 1. Distribution of Work Fatigue Age, Body Mass Index, Work Tenure and Work Shift

Variable	N	%
Fatigue		
Fatigue	47	55.3%
Not Fatigue	38	44.7%
Age		
≥ 40	64	75.3%
< 40	21	24.7%
Body Mass Index		
Not Normal	32	37.6%
Normal	53	62.4%
Work Tenure		
≥ 5	29	34.1%
< 5	56	65.9%
Work Shift		
Day Shift	32	37.6%
Night Shift	53	62.4%

The data presented are the percentages of various factors among nurses. Among the nurses, 55.3% reported experiencing fatigue, and 4.7% reported no fatigue. In terms of age, 75.3% of the nurses were 40 years or older, while 24.7% were below 40 years of age. Regarding body mass index, 37.6% of nurses had a non-normal BMI, while 62.4% had a normal BMI. In terms of work tenure, 34.1% of nurses had been working for more than 5 years, while 65.9% had been working for less than 5 years. Furthermore, 37.6% of the nurses worked day shifts, whereas 62.4% worked night shifts.

Table 2. Association between age, body mass index, work tenure, work shift with work fatigue

Variable		Fatigue				PR 95% CI	P Value
		Fatigue		Not Fatigue			
		N	%	N	%		
Age							
-	≥ 40	40	46.9	34	53.1	0.579 [0.415-0.808]	0.013
-	< 40	14	81.0	4	19.0		
Body Mass Index							
-	Not Normal	23	71.9	9	28.1	1.587 [1.100-2.291]	0.030
-	Normal	24	45.3	29	54.7		
Work Tenure							
-	≥ 5	23	79.3	6	20.7	1.851 [1.298-2.639]	0.003
-	< 5	24	42.9	32	57.1		
Work Shift							
-	Not Normal	35	56,5%	27	43,5%	1.882 [1.302-2.721]	0.002
-	Normal	6	19,4%	25	80,6%		

Bivariate analysis between age and work fatigue among nurses yielded a prevalence ratio [PR] of 0.579, with a 95% confidence interval of 0.415 to 0.808 and a p-value of 0.013. This finding suggests a statistically significant association between age and work fatigue among nurses. Specifically, older nurses may have a lower prevalence of work fatigue than younger nurses. A PR of 0.579 suggests that the prevalence of work fatigue was 42.1% lower among older nurses than among younger nurses. The 95% confidence interval of 0.415–0.808 suggests that we can be 95% confident that the true prevalence ratio falls within this range. Finally, a p-value of 0.013 indicated that this association was statistically significant.

Bivariate analysis between body mass index [BMI] and work fatigue among nurses yielded a prevalence ratio [PR] of 1.587, with a 95% confidence interval of 1.100–2.291, and a p-value of 0.030. This finding suggests a statistically significant association between BMI and work fatigue among nurses. Specifically, nurses with non-normal BMI may have a higher prevalence of work fatigue than those with normal BMI. A PR of 1.587 suggests that the prevalence of work fatigue is 58.7% higher among nurses with a non-normal BMI than among those with a normal BMI. The 95% confidence interval of 1.100–2.291 suggests that we can be 95% confident that the true prevalence ratio falls within this range. Finally, a p-value of 0.030 indicated that this association was statistically significant.

Bivariate analysis between work tenure and work fatigue among nurses yielded a prevalence ratio [PR] of 1.851, with a 95% confidence interval of 1.298–2.639 and a p-value of 0.003. This finding suggests a statistically significant association between work tenure and work fatigue among nurses. Specifically, nurses who have been working for more than five years may have a higher prevalence of work fatigue than those who have been working for less than five years. A PR of 1.851 suggests that the prevalence of work fatigue is 85.1% higher among nurses who have been working for more than five years than among those who have been working for less than five years. The 95% confidence interval of 1.298–2.639 suggests that we can be 95% confident that the true prevalence ratio falls within this range. Finally, the p-value of 0.003 indicates riate analysis between work shift [night shift and day shift] and work fatigue among nurses yielded a prevalence ratio [PR] of 1.882, with a 95% confidence interval of 1.302–2.721, and a p-value of 0.002. This finding suggests a statistically significant association between work shifts and work fatigue among nurses. Specifically, nurses who work night shifts may have a higher prevalence of fatigue than those who work day shifts. A PR of 1.882 suggests that the prevalence of work fatigue is 88.2% higher among nurses who work night shifts than among

those who work day shifts. The 95% confidence interval of 1.302–2.721 suggests that we can be 95% confident that the true prevalence ratio falls within this range. Finally, a p-value of 0.002 indicated that this association was statistically significant.

3.2. Discussion

Association between age and work fatigue

This suggests a significant association between age and work fatigue among nurses and that age is a protective factor against work fatigue among nurses. It is possible that older nurses have more experience and are better equipped to cope with the demands of their job, or that younger nurses may be more susceptible to burnout due to the stress of the job combined with other life stressors.

Older nurses may have more experience and better coping mechanisms to manage work-related stress and demands. They may have developed better time management skills, communication skills, and problem-solving abilities over time, which may have helped them manage their workload more effectively and prevent burnout [15]. Additionally, older nurses may have had more opportunities to develop supportive relationships with colleagues and supervisors, which may have been a protective factor against work fatigue. They may have a better sense of belonging and stronger support network, which can help reduce feelings of isolation and burnout. Older workers maintain or enhance their affective functioning, which is likely related to the effectiveness of the organization [16].

However, younger nurses may be more susceptible to work fatigue because of the challenges of adjusting to a new work environment and the steep learning curve associated with this new role. They may be more likely to experience role ambiguity, a lack of support, and other job-related stressors that can lead to burnout over time. According to Purcell et al., owing to activities outside the hospital, especially during weekends, younger nurses have higher levels of nursing stress than their more experienced counterparts [17].

Association between BMI and work fatigue

BMI is a significant risk factor for work fatigue in nurses. Being overweight or obese can increase the risk of a range of health problems such as cardiovascular disease, diabetes, and musculoskeletal disorders [18]. These health problems can in turn impact work performance and increase the risk of burnout, which may lead to increased work fatigue. Additionally, overweight and obese individuals may have lower levels of physical fitness, which can affect their ability to perform physically demanding tasks and increase their risk of injury [19].

Overweight and obese individuals may have a higher prevalence of sleep apnea [20]. Sleep disorders can lead to poor sleep quality and increased daytime fatigue. Poor sleep quality and excessive daytime sleepiness are known risk factors for work fatigue and may explain the association between BMI and work fatigue [21].

Overweight and obese individuals may experience psychological distress related to their weight status such as low self-esteem and negative body image. Psychological distress may contribute to increased levels of stress and fatigue, which can affect work performance and increase the risk of burnout [22].

Association between work tenure and work fatigue

The significant association between work tenure and fatigue among nurses could be attributed to several factors. Shorter-tenured nurses may have less experience and may not have

fully developed the coping mechanisms and abilities required to manage the demands of their jobs, which might increase stress and exhaustion [23]. In contrast, nurses who have worked in the field for a longer period may have grown more resilient and developed coping mechanisms, enabling them to handle the demands of their jobs better and lower the chance of becoming overworked [24].

Given that they may have been exposed to additional pressure and emotional demands at work over time, nurses who have worked for a longer period may be more susceptible to burnout or compassion fatigue [25]. This may result in a drop in job satisfaction, decline in engagement, and increase in work-related weariness.

Longer-tenured nurses may also be more vulnerable to musculoskeletal ailments or physical stress related to their employment, which can increase their work fatigue. Chronic pain or discomfort that can affect job performance and increase the risk of work fatigue might result from these injuries, which may gradually worsen over time and be worsened by repetitive motion or poor ergonomics [26].

Association between work shift and work fatigue

There are several reasons why night-shift employment is significantly associated with nurses' work fatigue. Working night shifts may interfere with the circadian clock, causing exhaustion and sleep problems. Working against this natural rhythm can influence the quality and quantity of sleep because the body's internal clock encourages wakefulness during the day and sleep at night [27]. Additionally, nurses who work night shifts may find it challenging to acclimatize to erratic sleep schedules, which can result in long-term sleep deprivation and daytime fatigue [28].

The risk of burnout and work fatigue is increased by a higher workload and more demanding patient care requirements related to night shift work. Nurses who work night hours have less access to resources and support, as well as necessary services such as diagnostic testing and doctor consultations. Increased stress and effort as a result of this may worsen the effects of sleep disturbances and contribute to worker fatigue [29]

Bivariate analysis between age and work fatigue among nurses yielded a prevalence ratio [PR] of 0.579, with a 95% confidence interval of 0.415 to 0.808 and a p-value of 0.013. This finding suggests a statistically significant association between age and work fatigue among nurses. Specifically, older nurses may have a lower prevalence of work fatigue than younger nurses. A PR of 0.579 suggests that the prevalence of work fatigue was 42.1% lower among older nurses than among younger nurses. The 95% confidence interval of 0.415–0.808 suggests that we can be 95% confident that the true prevalence ratio falls within this range. Finally, a p-value of 0.013 indicated that this association was statistically significant.

4. Conclusion

This study suggests that 55.3% of the nurses reported experiencing fatigue and that there were significant associations between age, body mass index, work tenure, and work shift with work fatigue. Hospitals should prioritize efforts to reduce physical strain and injury risks associated with nursing work. Hospitals should offer resources and support to help nurses manage the emotional demands of their work and prevent burnout and compassion fatigue.

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Conflict of Interest

This study has no conflicts of interest to declare.

Authors Contributions

The contributions of the authors are as follows: Haris conceptualized the study, designed the research methodology, conducted data analysis, and played a key role in manuscript development, ultimately approving the final version for submission. Andra contributed to the literature review, participated in data collection and analysis, and collaborated in manuscript drafting and revision.

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