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Relationship of Nursing Unit with Missed Nursing Care at the Aceh Government Hospital, Indonesia

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Abstract

Background: One of the important roles of a nurse is to provide safe nursing care to patients without missing anything. This is because unsafe treatment is one of the most important sources of morbidity and mortality in health services globally. This study aimed to identify the relationship of nursing unit with missed nursing care at the Aceh Government Hospital, Indonesia.

Methods: This study used a cross-sectional research design. Data were collected using Missed Nursing Care instrument. Data analysis was performed using the Chi-square test and multinomial logistic regression with 95% confidence level. The number of samples was as many as 196 respondents selected by purposive sampling technique.

Results: The result showed a significant relationship between shift work (p=0,000), number of working hours (p=0,000), and nurse-patient ratio (p=0,000) with missed nursing care. The ratio of nurses and patients ($\geq$ 7 patients) is the most dominant factor related to missed nursing care in the high category (p = 0.000 with odds ratio = 85.110).

Conclusion: The results of this study concluded that to prevent missed nursing care from occurring in the hospital, an ideal nurse-patient ratio with shift arrangements and standard working hours is required.

1. Introduction

The success in improving the quality of health is mostly occupied by nurses where in this case nurses have a significant contribution in influencing the provision of nursing care and services to patients directly for 24 hours.

The quality of nursing staff is the largest part of the health service staff which in health organizations greatly impacts the productivity of health service facilities in a hospital institution [1]. The role of nurses as a driving force in providing nursing care is a challenge that is felt every day. In carrying out this responsibility, nursing care providers often experience obstacles, delays and missed. Missed nursing care is a variety of nursing actions that are needed by patients but are not carried out either delayed or missed completely [2]. Missed nursing care is an act of negligence where nursing care is not resolved and fulfilled for various reasons which includes various aspects of fulfilment such as emotional, clinical, administrative aspects [3].

Nearly 94% of nurses working in five southwest US hospitals reported having missed at least one or more activities in nursing care [4]. Meanwhile Ball *et al.*, (2018) in his research which was conducted involving 401 practicing nurses in 46 hospitals in England stated that at least 345 or 86% of nurses in England postponed at least one nursing care activity to complete each shift [5]. This is in line with the research of Cho *et al.*, (2016) who conducted research and found that around 82% or as many as 2450 Registered Nurses in Korean hospitals reported delays in one or more providing nursing care on their last shift. must be implemented but constrained by insufficient and efficient time [6].

According to Nantsupawat *et al.* (2022), a low nurse-patient ratio, poor staffing and a lack of human resources in providing care are significantly associated with the incidence of missed nursing care [7]. Cho *et al.* (2022) also added that inappropriate scheduling and working hours and lack of rest will increase missed nursing care and reduce hospital organizational commitment [8].

Inadequate numbers of nurses also greatly affect the heavy workload during shifts [9]. Missed nursing care in the room occurs due to a lack of nurses and also a lot of workload and little time so that the inability of nurses to provide safe and effective services [10, 11].

The characteristics of effective and efficient working hours are important not only for the health of the nurses themselves but also for improving patient outcomes and health care [12]. Extended working hours and inadequate recovery between shifts can exacerbate fatigue, which leads nurses to provide low-quality and dangerous patient care [13, 14].

Based on research conducted in Sweden regarding factors related to missed nursing care, it was found that 74% of nurses reported that there were some treatments that were not carried out in 1 work shift due to the number of patients handled, the role of the nurse, the environment and the number of staff working [15]. Inadequate numbers of nurses also greatly affect the heavy workload during shifts [9].

Based on this description, the researcher wanted to know the relationship between the determinants of wards and missed nursing care at the Aceh Government, Indonesia.

2. Materials and Methods

This quantitative research used correlational-descriptive design with cross-sectional study was conducted among nurses at Aceh Provincial Government Hospital. The population in this study was all nurse working in medical and surgical wards. This study used purposive sampling with a sample of 196 registered nursed that investigated in December 2022.

The Missed Nursing Care by Nilasari (2020) was carried out that containing 48 statement items consisting of 41 positive and 7 negative questions [16]. The research instrument has tested the validity and reliability with the result r count = 0,856 and α = 0,828. Respondents were asked to report how often that item were missed using a 4-point likert scale: 1 = never, 2 = rarely, 3 = always, 4 = often (positive statement) and 1 = often, 2 = always, 3 = rarely, 4 = never (negative statement). Respondents used an online form link to fill out the research survey, which was forwarded by the charge nurses of each wards.

The socio-demographic data, care unit characteristic and the frequency of missed nursing care were descriptively analysis. The relationship between care unit and missed nursing care was analyzed using the Chi-square test and multinomial logistic regression with 95% confidence level. This study has obtained ethical eligibility from The Health Research Ethics Committee of Regional General Hospital Dr. Zainoel Abidin Banda Aceh Number 091/ETIK-RSUDZA/2020.

3. Results and Discussion
Univariate Analysis

Univariate analysis is carried out to analyze each variable from the research results. The univariate analysis in this study describes the research results descriptively regarding the frequency distribution of characteristic of respondents, characteristic of care unit and prevalence of missed nursing care that can be seen in below:

Nurses' age most were ranged between 21 - 31 years old (43.4%), most of them were female (83,2%), were graduated of associate degree in nursing (57.7%), experience in the current ward 1-5 years (49%), 138 nurses (70,4%) were contract employees and there were 70 nurses with the career ladder as clinical nurse II (46.4%).

Table 1: Characteristic of Respondents'

Characteristics of Respondents	Frequency	Percentage (%)
Age (Year)		
21 – 30	85	43,4
31 – 40	56	28,5
41 – 50	43	22
>50	12	6,1
Gender		
Male	33	16,8
Female	163	83,2
Educational Background		
Diploma degree in nursing	113	57,7
Bachelor degree in nursing	83	42,3
Experience in current ward (Year)		
1 – 5	96	49
6 -10	64	32,7
>10	36	18,4
Employment status		
Permanent employees	58	29,6
Contract employees	138	70,4
Career Ladder		
Clinical nurse I	70	35,7
Clinical nurse II	91	46,4
Clinical nurse III	35	17,9

Table 2: Nursing Unit Characteristics

Characteristics of Nursing Unit	Frequency	Percentage (%)
Work schedule		
8 hour/ morning or afternoon shift	54	27.6
>8 hour/ morning or afternoon shift	78	39.8
12 jam/ night shift	64	32.7
Weekly working time		
≤ 40 hours	111	56.6
> 40 hours	85	43.4
Nurse-patient ratio		
≤ 4 patients	62	31,6
5 – 6 patients	91	46,4
≥ 7 patients	43	21,9
Ward Unit		
Surgical	83	42,3
Medical	113	57,7

Table 2 shows that the majority nurses worked on >8 hours/ morning or afternoon shift (39.8%) and ≤40 hours weekly working time (56.6%). Regarding nurse-patient ratio, most the number of patients under nurses' responsibility range 5 – 6 patients (46.4%). In terms of ward unit, 113 nurses (57.7) worked in the medical ward.

Prevalence of Missed Nursing Care

The distribution of missed nursing care can be seen in Table 3 as follow:

Table 3: Frequency distribution of Missed Nursing Care

Missed Nursing Care	Frequency	Percentage (%)
Minimal/ Not Occur Missed Nursing Care	95	48,5
Low Missed Nursing Care	44	22,4
High Missed Nursing Care	57	29,1

Table 3 shows that 95 nurses (48.5%) had missed nursing care in the minimal/non-occurring category, 57 nurses (29.1%) had missed nursing care in the high category and 44 nurses (22.4%) had missed nursing care in the low category.

Bivariate Analysis

Bivariate analysis was conducted to determine the relationship between the independent variable, which are work schedule, weekly working time, nurse-patient ratio, ward unit with the dependent variable which is missed nursing care.

Table 4 below shows a significant relationship between care unit and missed nursing care carried out with Chi Square

Test. It was found that there was relationship between work schedule ($p=0.000$), weekly working time ($p=0.000$), nurse-patient ratio ($p=0.000$) with missed nursing care at Aceh Provincial Government Hospital. Meanwhile, there were no significant relationship between ward unit with missed nursing care ($p=0.968$) at Aceh Provincial Government Hospital.

Table 4: The Relationship between Nursing Unit Characteristic with Missed Nursing Care

Nursing Unit Characteristic	Missed Nursing Care								P-Value
	Minimal/ Not Occur		Low		High		Total		
	n	%	n	%	n	%	n	%	
Work Schedule									
8 hour/ morning or afternoon shift	9	16.7	12	22,2	33	61,1	54	100	
>8 hour/ morning or afternoon shift	44	56.4	22	28,2	12	15,4	78	100	0,000
12 jam/ night shift	42	65.6	10	15,6	12	18,8	64	100	
Weekly working time									
≤ 40 hours	69	62.2	27	24,3	15	13,5	111	100	0.000
> 40 hours	26	30.6	17	20	42	49,4	85	100	
Nurse-patient ratio									
≤ 4 patients	42	67,7	14	22,6	6	9,7	62	100	
5 – 6 patients	44	48,4	19	20,9	28	30,8	91	100	0.000
≥ 7 patients	9	20,9	11	25,6	23	53,5	43	100	
Ward unit									
Surgical	41	49,4	18	21,7	24	28,9	83	100	0.968
Medical	54	49,4	26	32,0	33	29,2	113	100	

Multivariate Analysis

A multinomial logistic regression to determine the strength of the relationship between two or more variables and also

shows the direction of the relationship between the independent and dependent variables. The result of multivariate analysis can be seen in table 5 below:

Table 5: Multinomial Logistic Regression Relationship between Predictors of Work Schedule, Weekly Working Time and Nurse-Patient Ratio Based on Each Category with High and Low Effects on Missed Nursing Care

Missed Nursing Care	Predictor	B	p-value	OR	95% CI	
					Lower	Upper
Low	Work Schedule					
	8 hour/ morning or afternoon shift	1.884	.002	.152	.047	.492
	>8 hour/ morning or afternoon shift	1.354	.016	.258	.086	.776
	Nurse-patient ratio					
	≥ 7 patients	1.643	.006	5.172	1.617	16.545
High	Work schedule					
	8 hour/ morning or afternoon shift	3.081	.000	.046	.013	.165
	>8 hour/ morning or afternoon shift	3.589	.000	.028	.007	.104
	Weekly Working Time					
	≤ 40 hours	1.355	.004	3.876	1.537	9.759
	Nurse-patient ratio					
	≥ 7 patients	4.444	.000	85.110	17.741	408.29
	5 - 6 patients	2.289	.000	9.863	2.779	35.008

Table 5 shows that for missed nursing care with a low category, the predictor of the number of hours worked has no relationship so it is not shown in table. Meanwhile, the work schedule; 8 hours/morning or afternoon shift, >8 hours/morning or afternoon shift and the nurse-patient ratio; ≥ 7 Patients have a low category relationship with missed nursing care, all p-values <0.05. The results of the analysis of missed nursing care in the high category can be seen that all predictors have a relationship with a p-value <0.05, but not for all categories of each predictor and are no longer shown in table 5. The predictor most related to the high category of missed nursing care is the ratio of nurses to patients; ≥ 7 Patients with p-value = 0.000 and odds ratio = 85.110.

These results indicate that the ratio of nurses and patients ≥ 7 patients tends to experience missed nursing care in the high category as much as 85,110 times compared to the ratio of nurses and patients < 7 patients after controlling for work schedule predictors and number of hours worked/week and missed nursing care in the minimum category/ does not occur as the reference category.

Based on the modelling results, it was found that the variable that was most significant or most significantly related to missed nursing care was the ratio of nurses and patients. In the estimation parameter test, it was found that the variable ratio of nurses and patients ≥ 7 patients tends to experience missed nursing care in the high category 85,110 times compared to the ratio of nurses and patients <7 patients after being controlled. So, it can be concluded that nurses who work with a patient ratio of ≥ 7 patients 85,110 times have a high risk of experiencing missed nursing care and nurses who work with a patient ratio of 5 - 6 patients

9,863 times tend to experience missed nursing care in the high category.

The ratio of nurses and patients is one of the determining factors for patient satisfaction. A higher workload and a high ratio of nurses and patients increases the risk of medication errors, iatrogenic complications, hospital morbidity, length of stay in hospital and endangers patient safety [17].

This is consistent with research which reports that the ratio of nurses and patients who do not match is one of the most significant predictors of delays and delays in nursing care [18]. In Rassin and Silner's study (2007 in Sharma & Rani, 2020) conducted in 168 Israeli public hospitals found that an increase in the ratio of nurses to patients from 1:4 to 1:6 increased patient mortality by 7% and with an increase of more further in the nurse-patient ratio to 1:8, the mortality rate increases to 14% [17].

Working with the ineffectiveness of the ratio of patients while on duty will make nurses tired at work thereby potentially causing a delay in implementing the nursing care needed by patients which leads to losses for patients and also nurses, where nurses have to add time from the time they should in order to be able to carry out the work that he had previously put off. Other studies report that the level of arrangement and execution of shifts by nurses with patients who are ineffective will increase the incidence of high fatigue and burnout at work [19].

The result of multivariate analysis in table 5 shows that work schedule has a significant relationship with missed nursing care, where the work schedule has the p-value of $0.000 < 0.05$ and has OR value in category of >8 hours/shift of 3.589. This mean that work schedule has 3.589-time chance of experiencing high missed nursing care.

In nursing care, scheduling work shift is very important to assist nursing in improving nursing care services and quality of work. It is hoped that this work schedule will be carried out as well as possible by nurses in accordance with the workload more effectively [20].

The results of this study are in line with Nurses' comprehensive review of work schedules (shifts) concluded that nurse shift patterns are an important factor in achieving recovery from burnout [21]. Giving nurses increased control over shift patterns has been explored as an intervention to reduce sick absences, and found that it reduced absenteeism by 6% [22].

This is supported by research conducted by Bae & Fabry (2014) which revealed that insufficient rest between shifts among rotating shift nurses was found to increase lethargy, fatigue, pathological fatigue, and excessive fatigue [23]. Many nurses also attribute the adverse effects of shift work, especially fatigue, to thwarting activities and efforts to eat healthy. This supports the existing evidence describing how health-related coping practices are often hampered by disruption of one's work rhythm due to shift work [24].

The result in table 5 also shows that the multivariate analysis for weekly working time has a significant relationship with missed nursing care, where the weekly working time has the p-value of $0.004 < 0.05$ and has OR value in category of >8 hours/shift of 3.876. This mean that work schedule has 3.876-time chance of experiencing high missed nursing care.

Working hours can be determined by the nurse's shift work schedule per week. In a similar concept, overtime can be measured by the contrast between scheduled hours worked and actual hours worked. The high number of working hours causes overtime. The culmination of longer working hours throughout the work week leads to shorter rest periods between shifts, which can not only affect nurses' recovery time but also increase their exposure time to work stress and potential hazards [23].

Long working hours have been shown to adversely affect the health and well-being of nurses, causing fatigue which can affect sleep, alertness, vigilance and reaction time [25]. Other findings also report that there is a positive relationship between long working hours and missed nursing care outcomes, including work accidents, absenteeism, and job dissatisfaction [23]. Nurses who work for 5 days with working hours > 40 hours greatly impact the decrease in the ability of nurses to provide nursing care and increase the possibility of unexpected events in patients including medication errors, falls with injuries, nosocomial infections, and errors or near misses. Research Son, Lee, & Ko (2019) states that the majority of nurses working more than 40 hours/week have a very significant relationship to adverse nurse outcomes for patients, low patient safety, increased patient safety accident reports also correlate with poor treatment outcomes [26].

One of the solutions to prevent the potential occurrence of missed nursing care in the workplace is to properly manage the distribution of responsibility for patients to nurses and adjust it to the level of dependence of patients in care and the ability of nurses to provide care. In addition, it is very important for a leader or manager in a room to determine how shifts are organized, in terms of shift length, overtime, weekly hours, rotational and/or permanent schedules [27], and return to work after rest (<11 hours between shifts) [28].

4. Conclusion
The study findings showed that work schedule, working time, and nurse-patient ratio that have a significant relationship with missed nursing care among nurses. However, ward unit was not significantly related to missed nursing care.

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