

The Relationship between Nurse Workload and Nurse Stress Level in Intensive Care Unit (ICU)

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ABSTRACT

Stress is generally being experienced by most of the nurses due to the duration of working hours and the number of patients. The high workload of nurses often results in fatigue, loss of concentration at work, the ability to remember information is very limited, being emotional and apathetic. This research is an analytic survey, with cross-sectional design in which the independent and dependent variables were examined simultaneously to determine the relationship between the nurse workload and stress level of nurses in the ICU wards of Dr. Pirngadi Regional General Hospital. This study uses primary data which were obtained by using questionnaires and secondary data were obtained from the medical record, with questionnaire instruments. The entire population were nurses in the ICU wards and samples in this study consisted of 24 nurses taken by total sampling technique. Based on the results of the chi square test at work variable, it is found that the X^2 count 3.154, which means there is not any relationship between working hours and the level of stress of nurses working in the ICU, and the variable of the number of patients X^2 count 6,446 which means there is a relationship between number of patients with stress level for nurses in the ICU wards. The study's findings indicate that while there is a correlation between the number of patients and nurses' stress levels in the General Hospital's intensive care unit wards, there is no correlation between working hours and nurses' stress levels.

Keywords: workload, stress level, nurses

INTRODUCTION

Nurses' workload is one of the causes of work stress because caring for too many patients makes it difficult to maintain high standards, feels unable to provide the support needed by colleagues and faces work limitations. Research consistently indicates that ICU nurses experience significant occupational stress, which is often exacerbated by heavy workloads and the emotional demands of patient care. For instance, Şanlıtürk highlights that the expectations placed on ICU nurses to be flexible and skilled in rapidly responding to critical situations contribute to increased occupational stress during the COVID-19 pandemic (Şanlıtürk, 2021). This sentiment is echoed by Alharbi and Alshehry, who note that ICU settings are among the most stressful clinical areas, with nurses frequently facing fears of making errors in complex interventions and dealing with emotionally charged situations involving critically ill patients (Alharbi & Alshehry, 2019).

Moreover, studies have shown a direct correlation between workload and stress levels among ICU nurses. For instance, Alnaiem et al. found that workload was one of the most reported stressors, significantly impacting the mental health of nurses (Alnaiem et al., 2022). Similarly, Huang et al. conducted a meta-analysis revealing that continuous exposure to unpredictable conditions and the demands of caring for unstable patients lead to high levels of anxiety, stress, and burnout among ICU nurses (Huang et al., 2022). The increased workload during the COVID-19 pandemic further intensified these stressors, as highlighted by Aqtam et al., who reported that the pandemic led to longer working hours and heightened stress levels for healthcare personnel, particularly nurses (Aqtam et al., 2023).

The implications of this relationship are profound, as elevated stress levels can adversely affect both nurse well-being and patient care quality. For instance, Guttormson et al. reported that burnout and moral distress among critical care nurses during the pandemic were significantly linked to their workload and the emotional toll of caring for severely ill patients (Guttormson et al., 2022). Furthermore, research by Mahmood et al. indicates that high stress levels among ICU nurses are associated with decreased job satisfaction and increased turnover intentions, which can ultimately compromise the quality of care provided to patients (Mahmood et al., 2020).

Dr. Pirngadi Regional General Hospital, a Medan city government-owned healthcare institution, has 24 nurses providing nursing care to patients in its ICU room. The hospital has 12 bed units, each with different diseases and patients requiring ventilator assistance and strict monitoring. The nurses work extra hard with a higher workload, causing work stress. Interviews and observations revealed that the workload includes caring for patients in a state of termination or death, performing tasks that should be completed by other shifts, handling ventilator damage manually, attending meetings that interfere with nursing tasks, inappropriate shift transfers due to nurses being late, dealing with patient families, and completing actions that must meet predetermined standards. These challenges can cause nurses to feel burdened and afraid of not being able to complete their tasks according to predetermined standards.

In conclusion, the interplay between nurse workload and stress levels in ICUs is a multifaceted issue that requires ongoing attention and intervention. Addressing these challenges is essential not only for the well-being of nurses but also for ensuring high-quality patient care in these critical settings. The purpose of the study was to determine the relationship between nurses' workload and nurses' stress levels in the ICU of the Dr. Pirngadi General Hospital, Medan.

METHOD

This type of research is an analytical survey research with a Cross Sectional research design where the independent variables and dependent variables are studied simultaneously to determine the relationship between nurses' workload and nurses' stress levels in the ICU room of Dr. Pirngadi Regional General Hospital. The population in this study were all nurses in the Medan ICU room, totaling 24 people. The entire population was used as a sample in the study, the total sampling was 24 nurses in the ICU room.

This study uses primary data obtained directly using a questionnaire. The data collection process is carried out in several stages, namely: Submitting a research letter to hospital, obtaining research permits, obtaining primary data by providing questionnaires to samples to be filled in after being filled in, the researcher collects the questionnaires again and obtains secondary data from medical records.

Aspect measurement of nurse workload includes: working hours and number of patients. Working hours are appropriate, if working hours are 8 hours/day given code 1, not suitable, if working hours are > 8 hours/day given code 2. The number of patients is large, if 2 nurses care for > 1 patient, given code 1, not much, if 2 nurses care for \leq 1 patient, given code 2.

Nurse stress levels include: 1) Severe stress, if the nurse checks statement number 1, it is given code 1, 2) Moderate stress, if the nurse checks statement number 2, it is given code 2, 3) Mild stress, if the nurse checks statement number 3, it is given code 3. Univariate analysis was performed to describe the distribution of each variable. The data is displayed in the form of a frequency diagram. Bivariate analysis using the chi-square test in the SPSS.

RESULTS

This study was conducted in the ICU room located on the 4th floor, the tools used in the ICU room are monitoring, ventilator, intubation device, ECG, Oxygen, Medicines and Infusion Fluids with a total of twelve beds. The number of personnel on duty in the ICU room is 24 people with DIII Nursing education, S1 Nursing, and Professional Nurses. Indications for patients entering the ICU room include: critically ill patients, unstable patients who require intensive therapy, experiencing severe respiratory failure, heart surgery and stroke patients.

Univariate Analysis

The research results can be seen in the data below:

Frequency Distribution of Working Hours, Number of Patients, and Stress Levels of Nurses

Table 1. Frequency Distribution of Working Hours, Number of Patients, and Stress Levels of Nurses

Variabel	Frequency (f)	Percentage (%)
Working hours		
Appropriate	10	41,7
Not appropriate	14	58,3
Number of patients		
Many	10	41,7
Not much	14	58,3
Nurse stress levels		
Heavy	2	8,3
currently	12	50,0
Light	10	41,7

Based on Table 1 above, out of 24 respondents who stated that the majority of working hours were not in accordance with 14 people (58.3%) and the minority who were in accordance with the working hours were 10 people (41.7%). The number of nurses in the ICU room was 24 people, the majority stated that there were not many patients, namely 14 people (58.3%) and the minority stated that there were many, namely 10 people (41.7%). The level of stress of nurses was 24 people, the majority of moderate stress was 12 people (50.0%) and the minority was severe as many as 2 people (8.3%).

Bivariate Analysis

The research results can be seen in the data below:

Relationship between Working Hours and Nurse Stress Levels

Table 2. Relationship between Working Hours and Nurse Stress Levels

Working time	Stress Levels of Nurses						Total		df	P value	X2 count
	Heavy		Currently		Light						
	N	%	N	%	N	%	N	%			
In accordance	0	0	4	16.7	6	25.8	10	100	2	0.018	8,074
It is not in accordance with	2	8.3	8	33.3	4	16.7	14	100			

Based on Table 2 above, of the 10 respondents who stated that working hours were appropriate, the majority experienced mild stress, 6 people (25.8%), and the minority experienced moderate stress, 4 people (16.7%), while the respondents who answered that it was inappropriate, 14 people, the majority were at moderate stress levels, 8 people (33.3%) and the minority experienced severe stress, 2 people (8.3%).

Based on the results of the chi square test of the relationship between working hours and stress levels of nurses in the ICU room, with a degree of significance (α) = 0.05 and $df = 2$, the calculation results obtained X^2 count 3.154a < X^2 table 5.99 and p value = -207, then H_0 is accepted and H_a is rejected. The conclusion is that there is no relationship between working hours and stress levels of nurses in the ICU room of Dr. Pirngadi Hospital, Medan.

Relationship Between Number of Patients and Nurse Stress Levels

Table 3. Relationship Between Number of Patients and Stress Level of Nurses in ICU

Number of patients	Stress levels of nurses						Total		df	P value	X2 count
	Heavy		Currently		Light		N	%			
	N	%	N	%	N	%					
Lots	0	0	8	33.3	2	8.3	10	100	2	0.539	1,236
Not many	2	8.3	4	16.7	8	33.3	14	100			

Based on Table 3 above, of the 10 respondents who stated that the number of patients was high, the majority experienced moderate stress, as many as 8 people (33.3%) and the minority experienced mild stress, as many as 2 people (8.3%), while the respondents who answered that there were not many, as many as 14 people, the majority experienced mild stress, as many as 8 people (33.3%) and the minority experienced severe stress, as many as 2 people (8.3%).

Based on the results of the chi square test of the number of patients with stress levels of nurses in the ICU room, with a degree of significance (α) = 0.05 and $df = 2$, the calculation results were obtained, namely X^2 count 6.446a > X^2 table 5.99 and p value = -0.40, then H_0 is rejected and H_a is accepted. The conclusion is that there is a relationship between the number of patients and the level of stress of nurses in the ICU room of Dr. Pirngadi General Hospital, Medan.

DISCUSSION

Relationship between Working Hours and Nurse Stress Levels

Based on the data that there is no relationship between working hours and stress levels of nurses in the ICU room of Dr. Pirngadi Regional General Hospital. Long working hours have been consistently linked to increased stress and burnout in nurses. For instance, a study by Fond et al. highlights that nurses in France reported significant stress levels associated with health-promoting work schedules, indicating that longer hours can exacerbate stress and burnout symptoms (Fond et al., 2023).

Similarly, Alasqah et al. found that nurses in Saudi Arabia experienced heightened stress levels due to prolonged working hours, which aligns with earlier findings that suggest longer shifts contribute to increased burnout (Alasqah et al., 2023). This sentiment is echoed in research conducted by Udho and Kabunga, which noted that nurses working extended hours faced detrimental effects such as fatigue and emotional exhaustion (Udho & Kabunga, 2022).

Moreover, the impact of shift work on nurse burnout cannot be overstated. Hiaq's research indicates that nurses working more than 44 hours per week and those on rotating shifts are at a higher risk for burnout, reinforcing the notion that both the quantity and nature of work hours significantly influence stress levels (Hiaq et al., 2024). Kangarlou et al. also reported that nurses with longer working hours were more likely to experience depersonalization, a key aspect of burnout, particularly during the COVID-19 pandemic (Kangarlou et al., 2022). This is supported by findings from Socaciu et al., which identified that night shifts and increased workloads are associated with elevated emotional exhaustion among nurses (Socaciu et al., 2020).

The literature further suggests that the cumulative effects of long working hours lead to adverse health outcomes. Tsou et al. reported that over 50% of nurses experienced burnout, which was exacerbated by long hours and high workloads, leading to detrimental changes in sleep and lifestyle habits (Tsou et al., 2021). This is particularly concerning as burnout has been linked to various health issues, including metabolic syndrome and cardiovascular diseases (Xie et al., 2021). Additionally, Zahednezhad et al. emphasized that poor work-life quality and excessive working hours significantly contribute to burnout levels among nursing professionals (Zahednezhad et al., 2021).

In conclusion, the evidence strongly supports the assertion that extended working hours are directly related to increased stress and burnout levels among nurses. This relationship underscores the need for healthcare organizations to consider work schedule reforms and implement supportive measures to mitigate the adverse effects of long working hours on nursing staff.

The researcher's assumption is that there is no relationship between working hours and nurse stress levels because on average nurses provide nursing care for less than 8 hours/day so that nurses can still do all nursing care without any workload. Of the 10 respondents who stated that it was appropriate, if the working hours were 8 hours/day, the majority experienced mild stress as many as 6 people (25.8%), these respondents stated that the working hours in the room

were in accordance with the specified time and the minority experienced moderate stress, namely 4 people (16.7%), while those who stated that it was not appropriate if the working hours were > 8 hours/day from 14 respondents. The majority were in moderate stress as many as 8 people (33.3%) and mild stress as many as 4 people (16.7%) and severe stress as many as 2 people (8.3%) these respondents admitted that the working hours they received were not in accordance with the specified working hours, this was due to caring for patients who needed total treatment and shift changes that did not come at the specified time.

Relationship between Number of Patients and Nurse Stress Levels

Based on the data, it can be seen that there is a relationship between the number of patients and the stress level of nurses in the ICU room. Nurses must improve their abilities so that they can follow developments in health science, especially care so that the actions taken can accelerate the patient's healing process.

Research indicates that as the number of patients increases, nurses face heightened psychological and physical demands, leading to elevated stress levels. For instance, Kokoroko and Sanda found that increased workload significantly contributes to job stress among nurses, corroborating findings from Almendra and others who noted that higher demands correlate with greater stress levels (Kokoroko & Sanda, 2019). Similarly, Yuan et al. highlighted that negative emotions stemming from patient interactions exacerbate nurses' perceptions of stress, further complicating their mental workload (Yuan et al., 2023). This is particularly evident in high-pressure environments such as emergency departments, where overcrowding can lead to significant job frustration and stress for nurses (Dewi et al., 2021).

Moreover, the COVID-19 pandemic has intensified these challenges, with studies showing that nurses working in high-demand settings, such as intensive care units, report higher stress levels due to increased patient loads and the complexity of care required (Sukoco et al., 2023). For example, research by Özkan and Ünlü demonstrated that surgical nurses experienced heightened anxiety and stress levels directly linked to their workload during the pandemic (Özkan & Aktaş Ünlü, 2021). This pattern is echoed in findings from Dabou et al., who noted that work-related stress among nurses during the pandemic was exacerbated by increased patient numbers and the associated workload (Dabou et al., 2022).

The implications of these findings are profound. High patient-to-nurse ratios not only lead to increased stress but also adversely affect the quality of care provided. Al-Yaqoubi and

Arulappan emphasized that as nurses are tasked with caring for sicker patients, the resultant workload can lead to detrimental outcomes for both patient care and nurse job satisfaction (AL-Yaqoubi & Arulappan, 2023). Furthermore, studies have shown that excessive workload can lead to burnout, which further diminishes the quality of care and increases turnover rates among nursing staff (Saher et al., 2022).

According to the researcher's assumption, the number of patients in the ICU room can be a burden and related to stress for nurses because when compared to the number of nurses each day with the number of patients, the number of patients is greater than the number of nurses, this can be seen from 10 respondents who stated that the number of patients is large, the majority experience moderate stress (33.3%) and the minority experience mild stress (8.3%). While from 14 respondents who stated that there were not many, the majority experienced mild stress (33.3%) and the minority experienced severe stress (8.3%). So the number of patients who must be treated each day exceeds the number of nurses on duty on each shift.

CONCLUSION

Based on the results of the research and discussion that have been described, the author draws conclusions regarding the relationship between nurses' workload and the level of stress of nurses in the ICU room of Dr. Pirngadi Regional General Hospital. There is no relationship between working hours and the level of stress of nurses in the ICU room. There is a relationship between the number of patients and the level of stress of nurses in the ICU room. The evidence strongly supports the assertion that an increase in the number of patients correlates with heightened stress levels among nurses. This relationship underscores the need for healthcare systems to address staffing ratios and workload management to mitigate stress and improve both nurse well-being and patient care outcomes.

LIMITATION

Based on the results of the research and discussion that have been described, the author has the limitation of only doing it in one intensive care room. It would be better if future researchers could research in several other inpatient rooms.

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