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Analysis of the Physical and Mental Workload of Nurses with the Implementation of Patient Safety During the Covid-19 Pandemic

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Abstract: The workload of nurses in hospitals encompasses both physical and mental aspects. Physical tasks include tasks such as lifting patients, administering infusions, monitoring vital signs, and administering oxygen, among others. Meanwhile, mental workload involves dealing with job complexity, providing mental and emotional support to patients and their families, especially those undergoing operations or in critical condition, employing specialized skills in patient care, and establishing effective communication with patients and their families. This study aims to examine the physical and mental workload of nurses in relation to the implementation of patient safety during the COVID-19 pandemic at Labuan Baji Hospital in Makassar. The research design employed a quantitative approach with a cross-sectional design, and the study sample consisted of 36 respondents. The objective of this study is to explore the relationship between the independent variables (mental workload and physical workload) and the dependent variable (implementation of patient safety). The study findings reveal a p-value of 0.409 for the relationship between physical workload and the implementation of patient safety, and a p-value of 0.069 for the relationship between mental workload and the implementation of patient safety. In conclusion, this study does not find a significant relationship between physical workload and the application of patient safety in the inpatient ward of Labuan Baji General Hospital in Makassar. Additionally, no significant relationship is observed between mental workload and the implementation of patient safety in the same setting. The results of this study contribute to enhancing understanding of patient safety within hospitals and its association with the workload of nurses.

Keywords: Mental; Physical workload; Safety

Introduction

The World Health Organization (WHO) reports from various countries about patient safety incidents with inpatient adverse events (KTD) of 3–16%. In New Zealand, KTD was reported to be around 12.9% of hospitalization rates, in England it was reported to be 10.8%, in Canada it was reported to be around 7.5%...31.

The Joint Commission International (JCI) and the World Health Organization (WHO) report that several countries have a 70% incidence of medication errors, despite the issuance of Nine Life Savings or 9 patient safety solutions by JCI and WHO. In fact, many patient safety problems continue to occur, including in Indonesia (Sulahyuningsih et al., 2017).

The reporting of Patient Safety Incidents in Indonesia by province has indicated that the DKI Jakarta province has the highest rate, which is 37.9% higher than the other eight provinces. The percentages for the other provinces are as follows: Central Java 15.9%, di Yogyakarta 13.8%, East Java 11.7%, South Sumatra 6.9%, West Java 2.8%, Bali 1.4%, Aceh 10.7%, and South

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Sulawesi 0.7%. Furthermore, in terms of disease specialization, the study found that the majority of errors occurred in the fields of internal medicine, surgery, and children's units, accounting for 56.7% of the total errors. This figure is higher compared to other work units (Azlina, 2021).

Patient safety is a basic principle of health services which views safety as a right for every patient in receiving health services. Patient safety incidents, hereinafter referred to as incidents, are any unintentional events and conditions that result in or have the potential to result in preventable injury to patients consisting of unexpected events (KTD), near misses (KNC), non-injury (KTC), incidents potential injury (KPC) and sentinel. Overall the patient safety program has been implemented, but problems in the field refer to the concept of patient safety, because even though they have attended socialization, there are still injured patients, risk of falling, risk of medication errors, inaccurate delegation during patient operations resulting in poor patient safety maximum (Kusumaningsih et al., 2020).

The quality of service provided by the hospital will build a good hospital image so that it gains the trust of its residents. As an effort to improve quality hospital health services through the Patient Safety Program which was initiated by the World Health Organization (World Health Organization) in 2004. Movement Hospital Patient Safety is a system that avoids the formation of injuries caused by mistakes for doing something (commission) or not doing actions that should be taken (omission) (Ulumiyah, 2018). Nurses should improve nursing care, especially reassessment of at-risk patients according to standard operating procedures. Nurses always apply patient safety in nursing care. Another impact is a decrease in the level of public trust in health services (Sukesi et al., 2021).

During the early period of the Covid-19 pandemic, the chart for the development of active cases and deaths in Indonesia showed a very sharp increase. You can see that in the first four months from March to June 2020, the development of COVID-19 tended to increase sharply in Indonesia, reaching 70 to 90%. Then from July to August 2020 the addition of COVID-19 cases had decreased compared to previous months. But unfortunately, in September there was a significant increase of 42.3% or 45,895 cases. Then in September, October and November the number of cases tends to decrease but the number continues to increase. Then a sharp increase occurred again in December 2020 and January 2021 (Lubis, 2020).

During the pandemic, the nurse's work shift becomes longer, which can cause nurses to become fatigued and health problems for nurses such as lack of sleep. Study Muzio et al., Long work shifts make nurses tired, poor work skills and a lot of worries that cause errors such as errors in medication administration that often occur on night shifts. If the nurse lacks sleep, it can cause a lack of concentration in caring for patients so that it can have an impact on patient safety incidents. Long work shifts can also cause nurses to be more often exposed to patients and the hospital environment and be vulnerable to the risk of infection (Hutahaean et al., 2022).

Efforts to accelerate handling by the government, trying to flatten the graph, until now it has gradually decreased. On the other hand, on the recovery side, the graph is slowly increasing. And compared to the world, the average development of COVID-19 in Indonesia is better. In the case of world deaths, it also increased sharply in March-April 2020. Then in line with Indonesia, the trend has been sloping until now. And as of March 1, 2021, Indonesia's percentage is 2.71%, and the world's is 2.22% with a difference of 0.5%. Then, for recovery in Indonesia, the percentage shows a sharp increase until August 2020, then tends to be sloping even though it continues to show an increase until now. Meanwhile, world healing experienced a drastic decline during March 2020, and then continued to increase until now. As of March 1 2021, the percentage of recoveries in Indonesia was 85.88%. While in the world it is 78.74% (Indrianingrum et al., 2021).

In the current situation of the COVID-19 pandemic, patient safety cannot be ignored by health workers working in services. Working in the midst of the COVID-19 pandemic is a concern for health workers because of the long, massive, and perhaps unprecedented duration of work, some health workers have additional implications in triggering negative psychological effects including emotional disturbances, depression, stress, low mood, fatigue, irritability, panic attacks, phobias, symptoms, insomnia, and emotional exhaustion. Patient safety (patient safety) is a basic principle of health services that views patient safety as the right of every patient in receiving healthcare services (Handayani et al., 2021).

One of the factors that can cause a decrease in patient safety is complaints of the high workload of personnel. The high workload occurred due to an increase in the number of patient visits and an increase in the Bed Occupancy Rate (BOR), while the number of staff working remained the same for a long period of time. The high workload of health workers in a hospital will have an impact on decreasing work performance. Nurse workload is the work volume of nurses in a hospital unit. Meanwhile, it is said that the work volume of nurses is the time needed to treat patients per day. It is important to know the workload as a basis for understanding the work capacity of nurses so that there

is a balance between nursing staff and workload (Yudi et al., 2019).

Medical personnel is responsible for patients. However, their activity also allows for stress. Stress on medical personnel influence work performance. Adverse physical and mental conditions affect their work. It influences the quality of services to patients. According to commonly, error rates of medical personnel are in the intensive care unit (ICU), Radiation Oncology (RO) and emergency department (ED). Physiological and psychological factors make medical errors occur. Some causes included increased workload, fatigue, ineffective communication, and wrong information. The nurse is a work that requires productive activity and little error. Changing of nurse mental workload affected patient health and safety (Restuputri et al., 2019).

The workload is one of many factors that can affect performance. The workload is an important thing that can affect the performance of nurses. In previous research on 394 pharmacists every month starting from 2012 to 2018 at the two most important health care centers in Taiwan, Shao et al. concluded that reducing workload can improve the performance of pharmacists (Pamungkas et al., 2022).

Nurses are part of the Human Resources (HR) component in the healthcare system in hospitals. They work directly on the front line and spend more time dealing with patients, without neglecting the roles of other workers. Unpleasant events can occur due to an imbalance between the number of patients and the number of nurses working at the hospital. As a result, nurses often face workloads that exceed their maximum capacity, leading to mental strain and unsafe actions (Kasmarani, 2012).

The workload of nurses working in hospitals consists of both physical and mental aspects. Physical workloads include tasks such as lifting patients, administering infusions, monitoring vital signs, and setting up oxygen supply, among others. On the other hand, the mental workload involves job complexity, preparing patients and their families mentally and spiritually, especially those undergoing surgeries or in critical conditions. Additionally, nurses need to possess special skills in patient care and establish effective communication with patients and their families (Wulandari, 2020).

Research conducted by Yudi et al. (2019) regarding the relationship between the physical and mental workload of nurses and the implementation of patient safety in the Emergency Room and ICU of the GMIM Pancaran Kasih Hospital Manado. Concluded that there was a significant relationship between the physical workload of nurses and the implementation of patient safety in the Emergency Room and ICU GMIM Pancaran Kasih Hospital Manado. Research conducted by Kusumaningsih et al. (2020) at the UPT Pesawaran District Inpatient Health Center implies that there is no relationship between the mental workload of nurses and the implementation of patient safety during the Covid-19 pandemic at the UPT Pesawaran District Inpatient Health Center (Kusumaningsih et al., 2020).

The sustainability of nursing services is strongly influenced by the availability of productive and prosperous individual nurses. High workload becomes one of the risks that can lead to decreasing accuracy, concentration, and job security, resulting in a decline in the quality and performance of nurses. Many results from various cognitive studies on health have concluded that among the factors that significantly contribute to human error, one is the occurrence of higher mental workload on workers (Wihardja et al., 2019).

The same research was conducted by Susanto et al in 2018 concerning the relationship between perceived workload and work stress in ER nurses and ICU Eka Hospital Pekanbaru in 46 nurses, providing evidence that 60.9% of nurses had a heavy workload perception and 39.1% of nurses with the perception of light workload (Susanto et al., 2015).

Based on data from the staffing section of the Labuan Baji Hospital in Makassar, the number of nurses in 2021 will be 230 people, 192 people in the inpatient room. From the level of education at the S2 education level there were 6 people, 31 people from Bachelor of Nursing, 84 people from Nursing education, 4 people from D4 Nursing and 59 people from D3 Nursing.

Based on the given description, the authors are interested in conducting research with the title: "The Relationship between Nurses' Physical and Mental Workload and the Implementation of Patient Safety during the COVID-19 Pandemic at Labuan Baji Hospital, Makassar."

Method

The type of research used in this study is quantitative research. Quantitative research is a systematic, planned, and clearly structured type of research that begins with the development of the research design. The research design employed in this study is the Cross-Sectional method, which focuses on measuring or observing independent and dependent variables at a single point in time. The objective of this study is to investigate the relationship between the independent variables (mental workload and physical workload) and the dependent variable (implementation of patient safety).

This research was carried out in the inpatient room of the Laburan Baji Hospital in Makassar, the reason for choosing the location was because the Laburan Baji Hospital is one of the referral houses for Covid-19 services. The time of this research was carried out in 2021.

The population is all nurses working in the inpatient room of the Laburan Baji General Hospital, Makassar, with a total of 192 people. Determination of the sample using the slovin formula with an error rate of 85% so that the sample used in this study was 36 respondents.

Research instruments are tools used to carry out research activities, especially as a measurement and data collection in the form of questionnaires, a set of test questions, observation sheets, etc. The research instrument used in this study was in the form of questionnaires and documentation which were considered related to the variables studied. The questionnaire consists of 3 variables studied and each variable has 10 questions using the Guttmann scale.

The data collection method was carried out by interviewing and observing the respondents. The data source used is primary data which is a data source that directly provides data to data collectors obtained through direct observation and interviews on the object under study. Secondary data is a source of data obtained from several sources that are considered to support the collection of such data, such as the head of the room, health care workers and through documentation data from medical records.

Data processing is done manually (by giving a code/checklist on the assessment sheet). The data processing steps are as follows: selecting, editing, coding, tabulating data. Data analysis was carried out using univariate to describe descriptively, regarding the frequency distribution and proportion of each variable studied, both the independent variable and the dependent variable. Univariate analysis aims to explain or describe the characteristics of each research variable, then proceed with bivariate analysis, which is an analysis of the results of the independent variables that are thought to have a relationship with the dependent variable. The analysis used is cross tabulation. To test the hypothesis, statistical analysis was carried out by entering the results of the respondent categories into the contingency table. Furthermore, it was analyzed using the Chi Square category data test**.**

Result and Discussion

Respondent Characteristic

Based on table 1, it can be shown that the characteristics of the respondents consisted of 19 (52.8%) male sex, while 17 (47.2%) female people. Most of the age group at the age of 31-40 (36.1%) people. The education level of most nurses is 20 (55.6%) and for the working period most are 1-5 years, 6-10 years (41.7%).

Table 1. Characteristics of Respondents in the Inpatient Room of the Labuan Baji General Hospital, Makassar

Respondent Characteristics	Frequency (n)	Percentage (%)	
	Male	19	52.80
Gender	Female	17	47.20
	amount	36	100.00
	20-30	8	22.20
Age group	31-40	13	36,10
	41-50	10	27.80
	>50	5	13.90
	amount	36	100.00
	D.III	14	38.90
Level of education	Nursing		
	Nurse	20	55.60
	S.2 Health	2	5.50
	amount	36	100.00
	1-5 yrs	15	41.70
Years of service	6-10 yrs	15	41.70
	>10 yrs	6	16.70
	amount	36	100.00

Univariate Analysis

Univariate variables consist of 3 variables, namely physical workload variables, mental workload variables and patient safety implementation variables. The results of the study obtained scores from several questions which were grouped into 2. The physical and mental workload variables were grouped into heavy and light, while the variable patient safety implementation was grouped into good and poor.

Table 2. The Distribution of Respondents Based on the Variables of Physical Workload, Mental Workload

Workload Characteristics	Frequency (n)	Percentage (%)	
	Heavy	27	75.00
Physical	light	29	25.00
	Amount	36	100.00
	Heavy	22	61.10
Mental	Light	14	38.90
	Amount	36	100.00

Bivariate analysis

Bivariate analysis to determine the relationship between variables which is an analysis of the results of the independent variables, namely the variables of physical workload and mental workload which are suspected to have a relationship with the dependent variable, namely the application of patient safety. The analysis used is cross tabulation. To test the hypothesis, statistical analysis was carried out by entering the results of the respondent categories into the contingency table.

Furthermore, it was analyzed using the Chi Square category data test.

Table 3. Variable Relationship between Physical Workload and the Implementation of Patient Safety

Physical workload	Application of patient safety					
	Good		Not good		p	
	n	%	n	%	n	
Heavy	20	74.10	7	25.90	27	0.409
light	5	55.60	4	44.4	9	
Amount	25	69.40	11	30.60	36	

Based on table 3 above, it can be shown that the statistical test results show that the p value is greater than the α value of 0.05. So that there is no relationship between the physical workload of nurses with the implementation of Covid-19 patients at Labuan Baji Makassar Hospital.

The relationship between the physical workload of nurses and the implementation of patient safety during the COVID-19 pandemic at the Labuan Baji General Hospital in Makassar.

Physical workload is a workload that requires physical energy and human muscles as a source of energy. Physical workload uses quite a lrge amount of energy compared to mental workload. Physical workload can be referred to as "manual operation" where work performance will fully depend on humans, both those who function as a source of power (power) or work controller (control). Energy consumption is the main factor and parameter of the severity of a physical workload. This is not caused by direct physical activity, but is caused by the work of our brains (Restuputri et al., 2019).

This research is in line with that conducted by Yudi et al. (2019) regarding the relationship between the physical workload of nurses and the implementation of patient safety in the emergency room and ICU GMIM Pancaran Kasih Hospital Manado. Can give a conclusion that most respondents who have a high physical workload, namely 17 respondents (56.7%), while those who have moderate physical workload are 13 respondents (43.3%). Activities that are routinely carried out by the implementing nurse at the hospital include: starting from handing over patients, lifting and moving patients, ambulating patients to inpatient rooms, placing infusions, observing the patient's condition, giving medicine to patients, sterilizing medical devices, taking blood specimens, counting fluid balance, and so on (Yudi et al., 2019).

The results of the research test using the Fisher's Exact Test were p = 0.409, meaning p > 0.05, so there was no relationship between physical workload and the implementation of patient safety during the COVID-19 pandemic at the Labuan Baji General Hospital, Makassar.

This research is in line with research conducted by Wulandari (2020) at RSUD Dr. Achmad Mochtar Bukittinggi Physical Workload In this study, the results showed that the physical workload experienced by nurses at RSUD Dr. Achmad Mochtar Bukittinggi is included in the light category, this means that the work done by the nurse does not physically burden the nurse while working (Wulandari et al., 2017).

Excessive workload can also have a negative impact on work quality and performance. That excessive physiological workload will have an impact on health and work productivity. In the context of ergonomics, the goal to be achieved is to ensure that the work system is designed in such a way as to obtain the best productivity and quality of work, which can be achieved if the load is within the limits of physical ability (Abdurahman et al., 2019).

This means that the nurse's physical workload variable can be used as a trigger to increase the application of patient safety during the Covid-19 pandemic carried out by nurses in addition to protecting patients as well as themselves to prevent contracting the Covid-19 virus. Work performed by relying on physical activity will result in changes in the function of the body's organs which can be detected through changes in oxygen consumption, heart rate, blood circulation in the lungs, body temperature, concentration of lactic acid in the blood, chemical composition in blood and water, art, evaporation rate and other factors. Physical workload will result in energy expenditure associated with energy consumption (Supardi et al., 2021).

The researcher's assumption that all work that will be done must have risks and workload. As a nurse, in carrying out her duties as a health worker both in hospitals and in other health facilities, she will be faced with various kinds of work, this is part of the demands of the profession so that even though the physical burden is heavy, it is still carried out as a nurse's responsibility.

Table 4. Variable Relationship between Mental Workload and the Implementation of Patient Safety

Mental workload	Application of patient safety					
	Good		Not good		p	
	n	%	n	%	n	
Heavy	18	81.80	4	18.20	22	0.067
light	7	50.00	7	50.00	14	
Amount	25	69.40	11	30.60	36	

The relationship between the mental workload of nurses and the implementation of patient safety during the COVID-19 pandemic at the Labuan Baji General Hospital in Makassar.

Mental workload is defined as one of the conditions experienced by a worker in carrying out his duties where there are only mental resources in limited conditions. Because human ability to process information is very limited, this will affect the level of performance that can be achieved. Mental workload includes work complexity, mental and spiritual preparation for patients and families, especially those who will undergo surgery or are in a critical situation, work with special skills in caring for patients, and must establish good communication with patients and families (Yudi et al., 2019).

The results of this study are in line with research conducted by Yudi et al. (2019), The final results of the analysis using the Chi Square test obtained a p value of 0.089 which means that the p value (0.089) > value α (0.05) so that it can be concluded that there is no relationship between the mental workload of nurses and the implementation of patient safety in the emergency room and ICU GMIM Pancaran Kasih Hospital Manado (Yudi et al., 2019)

Another study conducted by Frichilia et al. (2016) stated that excessive workload due to the demands of tasks that must be completed does not always interfere with performance, but can spur a person to work in order to achieve optimal results (Frichilia et al., 2016).

The mental workload of nurses who have to work and interact with patients professionally for 24 hours would arise. It may because of continuous adaptation in providing 24-hour nursing care, obscurity of task demands, limitations of nurses' ability during care, the lack of motivation, and the mood of the nurse with the psychological burden. A high mental workload would harm nurses, and causing physical, psychological and behavioral changes (Destiani et al., 2020).

Nurses who have a moderate mental workload with good patient safety implementation are more due to factors from the experience and composure that nurses have in facing the demands of the task. The higher the nurse's tenure, the more experience the nurse gets, so that the level of proficiency in the work she does will be higher, the implementation of patient safety will be even better (Sigit et al., 2022).

For this reason, researchers argue that a job that is liked will reflect the positive attitude of the workers so that even though the job requires more work, the workers can still do their best. The attitude of an adult nurse in solving problems that occur in the work environment so as not to cause stress that will have an impact services provided to patients and their families.

Conclusion

The results of research conducted in the inpatient room of the Labuan Baji Makassar Hospital which will be carried out in 2021, it can be concluded that there is no relationship between the physical and mental burden of nurses with the application of patient safety during the COVID-19 pandemic at the Labuan Baji Hospital Makassar. It is recommended that nurses in providing services to patients, especially Covid-19 patients, maintain the service standards that have been set.

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Author Contribution

Abubakar and Zainal designed the research and validated the data. Hamza, Abdullah, and Hilmiah conducted research, analyzed, and interpreted the data. Zainal and Hilmiah wrote the script. Abubakar and Hamzah revised the manuscript and were primarily responsible for the content and final publication. All authors reviewed the results and approved the final version of the manuscript.

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Conflicts of Interest

The authors have stated that there are no competing interests.

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