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Importance of Nurse Workload Management as the Main Factor Affecting a Patient Safety Culture

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Abstract

Introduction: The implementation of patient safety goals is the compliance behavior of health workers in implementing the standards and targets set by the hospital concerning international patient safety goals to ensure safe services for every patient. The international patient safety goals adopted by the hospital accreditation committee (KARS) have 6 (six) goals. **Objective**: The purpose of the study was to obtain empirical evidence of the effect of knowledge and workload on the implementation of patient safety goals mediated by patient safety culture. **Method**: This type of research is a causative quantitative analytic study with a cross-sectional research design. The sample population of this study is 140 nurses with a saturated sampling technique. In this study, measurements are done on primary data in a questionnaire distributed by Google Form to 140 respondents, and all respondents filled out the Google Form. In this study, the analysis was carried out using path analysis. **Results**: The results showed that knowledge, workload, and patient safety culture simultaneously had a positive and significant effect on implementing patient safety goals. The research findings show that patient safety culture can mediate patient safety goals. The workload does not directly influence the performance of patient safety goals. **Recommendations:** for hospital management to be more attentive to nursing workload management, the main factor affected patient safety culture. For further research, data from other hospital stakeholders can be added.

Keywords: knowledge, workload, safety culture, patient safety goals implementation

Introduction

The hospital is the place where people go when they need health services. Those who come to the hospital have the right to get quality and safe services. Events experienced by patients that can impact patient safety are called Patient Safety Events. Patient Safety Events vary from Hazardous Conditions, Near-miss Events, No-harm Events to Adverse Events. An adverse event that has a severe impact that causes disability and even death is called a sentinel event (1).

The success of preventing patient safety events is highly dependent on the human factor. Therefore knowledge, workload, and patient safety culture are factors that need to be considered to implement patient safety goals (2) (3).

At Hospital X Tangerang City, there were still patient safety incidents that should not have happened. Therefore, it is necessary to examine the factors that influence the implementation of patient safety goals. The primary purpose of this study is to provide input for the management of Hospital X Tangerang City to make improvements that can reduce the incidence of patient safety incidents. At Hospital X Kota Tangerang, there were still events where superiors were angry with nurses who reported patient safety events. This is an indication of a low patient safety culture. From the results of simple investigations and RCA (Root Cause Analysis), from several incident reports, "forget" or "do not know" are the most common reasons. This shows a lack of patient safety knowledge among the nurses. Another reason was "busy," which indicated the need to analyze the nurse's workload. Those facts are confirmed by the Focus Group Discussion (FGD) result as the initial data collection at Hospital X in Kota Tangerang. 58% of participants assumed that the patient safety culture among nurses at Hospital X was still low, 42% thought patient safety knowledge among nurses was insufficient, and 50% of participants considered that nurses' workload at Hospital X was well managed. More than 70% of reported incidents, including Hazardous Conditions, Near-miss Events, No-harm Events, and Adverse Events that occurred at Hospital X Kota Tangerang, involved nurses who directly served patients. This is not surprising considering the number of nurses as the majority of human resources in hospitals. Reports from January to March 2020, which are 1 Hazardous Conditions, 3 Near-miss Events, 2 No-harm Events, and 2 Adverse Events, all involve nurses. From simple investigations to Root Cause Analysis (RCA), the most common reasons are excessive workload and lack of knowledge about patient safety. This happens because of the high turnover of nurses at Hospital X Kota Tangerang. For new nurses, who do not have the knowledge and experience of working in hospitals, incident reporting is a unique experience that requires repetition to become a habit.

The novelty of this study is placing patient safety culture as a mediating variable and using path analysis as the data analysis method.

Literature Reviews

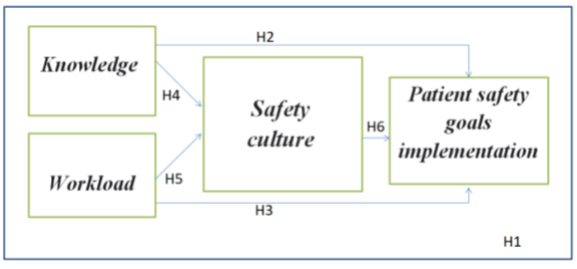
Patient safety is an essential component in the quality of hospital

services. The first dimension of the quality of hospital services is patient safety. Safety as the first domain of hospital service quality refers to "freedom from accidental injury"(3). International Patient Safety Goals (IPSGs) consist of 6 goals, namely: Goal 1: Identify patients correctly; Goal 2: Improve effective communication; Goal 3: Improve safety High Alert Medications; Goal 4: Ensure correct site, correct procedure, and correct patient surgery; Goal 5: Reduce the risk of healthcare-associated infection; Goal 6: Reduce the risk of patient harm resulting from falls (4).

In this study, following the conditions of Hospital X Kota Tangerang, only target one, and target five will be studied. Implementing patient safety goals will serve as a layer of defense to prevent patient safety incidents from occurring. Therefore, we can conclude that patient safety is essential continuously and consistently.

Safety culture is built by all employees' attitudes, beliefs, perceptions, and values about safety (2). Patient safety culture defines our belief system that will govern how we behave (1).

Study Model



METHOD

Design

The design of this study used a cross-sectional approach with quantitative causality research, which aims to see the effect of knowledge and workload on the implementation of patient safety goals mediated by patient safety culture.

Sample, sample size & Sampling technique

The sample in this study were nurses with a total sample of 140 respondents by total sampling, which are the entire population. The inclusion criteria were all nurses who directly served patients. The exclusion criteria were nurses who had filed resignations and nurses who held managerial positions.

Instrument for data collection

The data collection instrument used a closed questionnaire. Each statement item was provided with a choice of answers in a rating scale using a Likert scale, with the lowest score being one and the highest score being five. The knowledge variable consists of 3 components with 3 question items each. The workload variable consists of 4 components with 3 question items each. The patient safety culture variable consists of 7 components with 3 question items each. The variable implementation of patient safety goals consists of 2 components with 3 question items each.

The questionnaire that would be distributed was in electronic form using a google form to 140 respondents. The collection was done directly without intermediaries.

Data analysis was the validity test using Pearson Product Moment Correlation. It was said to be valid if the

value of r count > r table. Data from 30 respondents were taken for validity testing. Questionnaire items that were not valid were not included in further analysis. The reliability test used the Cronbach Alpha (α) > 0.6. The results showed that all of the variables in this study were reliable. All variables tested for reliability were found to be valid and dependable.

The Cronbach alpha scores of instruments including 1) Knowledge questionnaire (Cronbach alpha scores: 0.935); patient safety culture questionnaire (Cronbach alpha scores: 0.951); and patient safety goal implementation (Cronbach alpha scores: 0.851)

Statistically Analysis

A normality test was carried out on all data, and it was found that all variables had data that were normally distributed. An outlier test was also carried out, and no outliers were found. Data analysis in this study used a path analysis model by the AMOS program.

Ethical consideration

This research has gone through an ethical review organized by Esa Unggul University. The ethical approval letter number is 0341.21.341/DPKE.KEP/FINAL.EA/UEU/IK/2021. Each respondent has signed the informed consent.

RESULT

Characteristic of respondents

Table 1. Characteristic of respondents

	Characteristics	Respondents	Percentage
1	Gender		
	Male	26	19%
	Female	114	81%
TOTAL		140	100%
2	Age		
	17 - 25 years old	58	41%
	26 - 35 years old	72	51%
	36 - 45 years old	10	7%
TOTAL		140	100%
3	Length of work		
	< 1 year old	30	21%
	1 - 5 years old	83	59%
	6 - 10 years old	21	15%
	11 - 15 years old	5	4%
	> 15 years old	1	1%
TOTAL		140	100%
4	Work unit		
	Hemodialysis	11	7.9%
	Emergency departments	15	10.7%
	Intensive Care Unit (ICU)	8	5.7%
	Operating room	8	5.7%
	Dental nurse	1	0.7%
	Sick baby ward	4	2.9%
	Polyclinic	25	17.9%
	Isolation Inpatient Room	29	20.7%
	Regular Inpatient Room	39	27.9%
TOTAL		140	100%
5	Last education		
	D3	104	74.3%
	D4	3	2.1%
	Strata 1	8	5.7%
	Strata 1 NERS	25	17.9%
TOTAL		140	100%

Table 2. Direct effect hypothesis testing among variables

Variable	Standard Estimate	S.E.	C.R.	P
Knowledge of Patient safety goals implementation	0.456	0.095	6.061	0.000
Workload to Patient safety goals implementation	-0.121	0.079	-1.261	0.207
Knowledge of Safety culture	0.257	0.074	4.399	0.000
Workload to Safety culture	0.635	0.048	10.857	0.000

Safety culture to Patient safety goals implementation	0.367	0.102	3.588	0.000

The data above found that the correlation between workload and the implementation of patient safety goals has a p value> 0.05, so H3 is rejected.

The goodness of Fit Model

Table 3 shows that the value of X2 – Chi-Square is 0.629, and the probability is p=0.428. A probability above 0.05 indicates that Ho, which states no difference between the sample covariance matrix and the estimated population covariance matrix, is acceptable. This means that the sample covariance matrix and the estimated population covariance matrix are the same, so the model has declared a good model (fit).

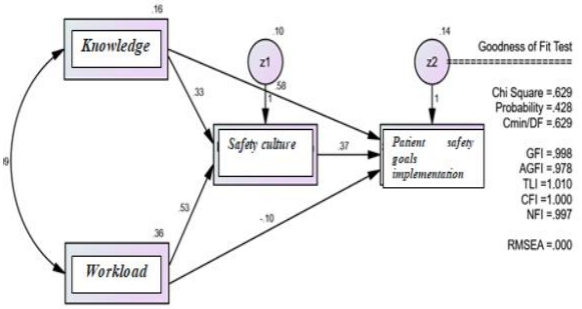
Table 3. Goodness of fit model

Goodness of fit	*Cut–off Value*	Model Results
X^2 – *Chi-Square*	Expected value is small with DF=1 table value = 3.815	0.629
Probability	≥ 0.05	0.428
Cmin/DF	≤ 2	0.629
GFI	≥ 0.90	0.998
RMSEA	≤ 0.079	0.000
AGFI	≥ 0.90	0.978
TLI	≥0.90	1.010
CFI	>0.90	1.000

Hypothesis test

The relationship between direct and indirect variables was carried out using the AMOS program. The results can be seen in the image below:

Figure 1. Research Construct Model



Discussion

The effect of knowledge and workload on implementing patient safety goals with patient safety culture as an intervening variable.

Hypothesis testing conducted using path analysis with the AMOS program's help shows an influence between knowledge, workload, and patient safety culture on the implementation of patient safety goals. All variables have a significant effect (p-value 0.000 – 0.012). The estimated values of 11.9% and 19.2% indicate that although small, patient safety culture as an intervening variable positively influences knowledge outcomes and workload to the implementation of patient safety goals. This can be interpreted that other factors influence the relationship between these variables, which were not examined in this study.

From the results of the determination analysis, the influence of knowledge, workload, and patient safety culture on the implementation of patient safety goals is 41.8%. In comparison, the remaining 58.2% is influenced by other factors outside of this study.

Implementation of patient safety goals is new behavior for health workers, especially nurses who are just starting their careers in the hospital. A new behavior requires factors that support

the implementation of the behavior. Safety culture is one of the factors that have a strong influence on a person's behavior (5), (6),
(7). According to Tylor (5), culture is a complex consisting of knowledge, belief, art, law, morals, habits, and abilities acquired by a person as part of a community, which is a hospital. Therefore, knowledge is also a factor that influences a person's behavior.

Effect of knowledge on the implementation of patient safety goals

There is a positive influence of knowledge on implementing patient safety goals (p-value <0.05) with an estimated value of 0.456. This proves that knowledge affects the implementation of patient safety goals by 45.6%, and other variables outside this study influence the remaining 54.4%. The direct influence of knowledge on the implementation of patient safety goals is 0.456, while if a patient safety culture mediates it, the estimated value is 0.119. It can be concluded that patient safety culture has a role in improving the implementation of patient safety goals.

Based on descriptive analysis using the three-box method on the knowledge variable, the highest index value is found in P7, an indicator of reducing the risk of infection related to health services, namely "I can explain five moments of hand hygiene" with a score of 93.43. The lowest index value is found in P1 of the incident reporting indicator, "I understand how to report patient safety incidents," 82.86.

These results indicate that the hospital needs to pay attention to patient safety incident reporting to improve the implementation of patient safety goals.

Based on the discussion above, the study results support several studies conducted in Indonesia, which also show the relationship between nurses' knowledge and the implementation of patient safety goals. Sithi & Widyastuti (8) conducted a study on the factors that contribute to patient safety incidents in implementing patient safety goals for inpatients at a hospital in the city of Depok. In this study, it was found that staff and knowledge factors are some of the factors that contribute to patient safety incidents. Research conducted by Soeryo Koesoemo et al. (9) shows the relationship between nurses' knowledge and attitudes towards the application of patient safety goals in the inpatient room of Aulia Hospital, South Jakarta. Syarianingsih Syam & Kurnia Widi Hastuti (10) researched the relationship between nurses' knowledge and attitudes towards implementing patient safety goals in Yogyakarta Hospital.

Effect of workload on the implementation of patient safety goals

The result found no effect of workload on the implementation of patient safety goals with a p-value of 0.207 (>0.05) with an estimated value of -0.121. This shows that the workload does not affect the implementation of patient safety goals. Based on these results, it can be concluded that the nurse's workload does not affect patient safety goals.

Based on the analysis of the distribution of respondents using the three-box method, the average distribution of respondents with an average index value of 73.77 lies in the

high category. The highest index value of 80.71 is in BK4, the task level indicator, namely "I feel I can complete every task given ."The lowest index value is found in the BK1 unit level indicator, namely "I feel that my unit's workload is balanced between the number of patients and the number of nurses," with an index value of 65.57. Employees feel that the workload of their unit is balanced between the number of patients and the number of nurses. As much as 40% of employees think that there is a balance between the number of patients and nurses.

One of the factors that influence the risk of decreasing performance is workload. An increase in workload can occur if the number of nurses does not match the level of care needs of the patient (11). For this reason, the hospital can use various methods of calculating the needs of nurses according to the conditions and needs of the hospital. Hospital management can use the formula from the Indonesian National Nurses Association (PPNI) workshop to calculate the need for nurses if it takes into account the number of visits and length of treatment per patient. It can also be used if the ability and resources for personnel planning are limited, the type, type, and volume of health services are relatively stable and quite effective in overcoming the occurrence of spikes in cases because it takes into account the full capacity of inpatient care (total used) which can occur at any time.

The results of this study support the result of other research Sitanggang (12), which finds that the strength of the relations between the two variables, namely the workload of nurses and patient safety, is still very weak. Nurse workload is the volume of work of nurses in a hospital unit. At the same time, the work of nurses is the time needed to treat patients 24 hours per day. It is essential to know the workload as the basis for knowing the work capacity of nurses so that there is a balance between the nursing staff and the workload.

Effect of knowledge on patient safety culture

Through statistical calculations using Amos V21, it is known that there is a positive and significant influence between knowledge to patient safety culture. Based on the coefficient of determination test (R2), the estimated value of the knowledge variable on patient safety culture is 0.257. This means that the knowledge variable affects patient safety culture by 25.7%, while other variables outside this study influence the remaining 74.3%.

Levett-Jones et al. (13) conducted a study exploring nurses' knowledge about patient safety. According to him, nurses' perception or confidence about their level of knowledge is more influential than the actual level of knowledge. Perceptions of knowledge and self-confidence affect the formation of a patient safety culture.

According to the book Patient Safety Culture: Theory, Methods, and Application – 1st edition, Waterson (14) shows that patient safety culture is formed from the learning process so that there is a relationship between knowledge and culture. Thus, the higher or deeper one's understanding of something, the more likely that

knowledge becomes a culture within a person. Previous research has linked knowledge and learning processes with patient safety culture (13), (15), (16), (8), (17), (18), (19), (20), (21), (14), (22), (23).

Effect of workload on patient safety culture

Based on the results of statistical tests on the estimated value, it is known that the workload has a positive and significant effect on patient safety culture. Based on the estimated value of the workload, it impacts 63.5% on patient safety culture. Other variables outside the study influence the remaining 36.5%. This variable appears to be the dominant or most significant variable influencing work safety culture.

Based on descriptive analysis using the three-box method, the average index value of 73.77 lies in the high category. The highest index value of 80.71 is in BK4, the task level indicator, namely "I feel I can complete every task given ."The second-lowest index value is found in BK9, the patient level indicator, namely "I feel that the distribution of patients is quite evenly distributed among all health workers," with an index value of 71.

The results of this study are in accordance with Flin et al. (24) in his book Measuring safety climate: identifying the common features, suggests that one of the factors that influence patient safety culture is work pressure, namely the work environment and workload. Previous research has also found a relationship between workload and patient safety culture. In the book Patient Safety Culture: Theory, Methods, and Application – 1st edition, Waterson (14) shows that the formation of a patient safety culture can be hindered by things that are not liked or become a negative factor for someone to adopt a new culture. The excessive workload can be a barrier to forming a patient safety culture in a nurse. Other studies have also shown that for nurses with undue burdens or organizations that place too much emphasis on labor efficiency, the formation of a patient safety culture is also hampered (25), (26).

Effect of patient safety culture on the implementation of patient safety goals

The results of statistical testing showed that patient safety culture had a positive and significant effect on the implementation of patient safety goals.

The average index value of 78.33 lies in the high category based on descriptive analysis using the three-box method. The highest index value is found in the BPK4 safety system indicator, namely "I feel the hospital has a good SOP in the implementation of patient safety," with an index value of 82.86. The lowest index value is found in the BPK8 work pressure indicator with a value of 70.29, namely "I can always cope with work pressure in this hospital." there are 44% of employees who are doubtful if employees can overcome work pressure problems in a hospital environment.

The results of the study support previous research, which has found that culture is a decisive factor that influences the implementation of patient safety goals (8,13-23).

Study Limitations

This study has some limitations that can be a source for future studies. The limitations found in this study: this study

was conducted on nurses who work in different areas, which means the knowledge and perceived workload will be different. For example, nurses in the inpatient and outpatient departments will be other in their workload and level of knowledge.

Conclusion

Knowledge and workload mediated by patient safety culture partially have a positive and significant effect on the implementation of patient safety goals, and learning has a direct impact on the implementation of patient safety goals, but workload does not directly affect the implementation of patient safety goals.

Managerial Implications

This study proves the hypothesis of the influence of knowledge, workload, and patient safety culture on implementing patient safety goals. Hospitals, in this case, management must be able to increase nurses' knowledge about patient safety and manage the workload of nurses well so that the implementation of patient safety goals can be carried out optimally.

It is necessary to periodically evaluate the patient safety knowledge of employees, especially nurses. Patient safety socialization and resocialization, both for incident reports and patient safety goals, need to be a routine agenda. This can be done effectively and efficiently by using online meetings regularly and continuously by adding exciting elements such as competitions and quizzes with prizes to avoid boredom. Nurse workload management by managing a reasonable work schedule needs to be considered to eliminate the perceived imbalance between the number of nurses and patients. The competence of nurses as the ability to deal with workloads needs to be continuously improved through training and education so that there is no excessive workload without having to add too much human resource. Teamwork also needs to be formed and built through team-building activities so that nurses can work well together. In terms of patient safety culture, hospital leaders need to continue to pay attention to what makes up a safety culture starting from hospital management. A no-blaming culture is formed, and finally, a patient safety culture.

If all these aspects can be met, it is hoped that knowledge, workload, and patient safety culture will be formed that support the implementation of patient safety goals.

Implication for further study

To obtain more representative results, it is necessary to conduct research with a larger sample under normal conditions.

Recimmendation

Hospital management needs to form systems and patterns that can improve knowledge of managing workloads well and form a patient safety culture by paying attention to the continuity of patient safety socialization and resocialization. It also evaluates and enhances nurse schedule arrangements, increasing nurse competence, and teamwork to establish a patient safety culture.

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