

EFFECT OF WORKLOAD AND NURSE COMPETENCY ON PATIENT SAFETY INCIDENTS AND APPLICATION OF 6 PATIENT SAFETY GOALS AS INTERVENING VARIABLES

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ABSTRACT

Patient safety is something that needs to be prioritized in health services. This study examined nurses' workload and competence in patient safety incidents using the six patient safety goals as intervening variables. A cross-sectional study at a private hospital in Tangerang in February 2022. The research subjects were all functional nurses in the hospital. There is an influence between workload, nurse competence, and implementation of the six patient safety goals on patient safety incidents ($p < 0.001$). Low workload and high nurse competence can improve the implementation of the six patient safety goals, reducing patient safety incidents. Based on the length of work, most have worked 1-4 years, with a total of 38 respondents (40.4%), and the least are those who have worked for more than seven years, namely with a total of 1 respondent (1.1%) Based on position work, 94 nurses were respondents, ward nurses were the positions that had the most number of nurses, namely 43 nurses (45.7%), while the least were head poly nurses, namely five nurses (5.3%). In addition to workload, our results also show that nurse competence influences the implementation of the six patient safety goals. A nurse providing nursing care must have the right knowledge, skills, and attitudes to deal with the complexities of health care, as evidenced by the level of nurse competence. There is an influence between implementing the six patient safety goals and patient safety incidents. If implementing the six patient safety goals is low, patient safety incidents will increase.

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INTRODUCTION

According to government regulation number 47 of 2021 in the Republic of Indonesia concerning the administration of the hospital sector, a hospital is a health service institution that organizes full individual health services that provide inpatient, outpatient, and emergency services (Susetiyono & Iftitah, 2021). Patient safety is the main priority in health services and the most important aspect of quality management (Wianti et al., 2021).

Every year, it is estimated that 42.7 million adverse events occur in patients; these data show that injury to patients is a major cause of morbidity and mortality in the world (Suparman, 2022). Nurses are professionals who play an important role in the functioning of the hospital. In carrying out their functions, nurses are the staff who have the most contact with patients. Nurses are also part of a team, which includes other professionals such as doctors. The breadth of the nurse's role allows for the risk of service errors (Cahyono, 2015).

The global RN4CAST project, with over 11,000 patients and 33,000 nurses, demonstrated that when nurses have a heavy workload, they leave important tasks unfinished, negatively impacting patients (MacPhee et al., 2017). The impact of a high nursing workload leads to lower quality of care and patient safety, as well as higher levels of anxiety, stress, and fatigue. Negative effects for patients are side effects and failure to save the patient (MacPhee et al., 2017). In addition, the level of education influences the professional values of practising nurses. A higher level of nursing education than a practising nurse can result in greater awareness and adoption of the nurse's professional values during the clinical practice of nursing. Knowledge (theory and practical skills) is an important factor in developing the professional values of nurses (Sibandze & Scafide, 2018).

Our research aims to analyze the effect of workload and nurse competence on patient safety incidents by applying the six patient safety goals as intervening variables. It is hoped that this research can assist in reducing patient safety incidents.

METHODS

This study used a cross-sectional design and was conducted in February 2022 at Tangerang Hospital, Indonesia. We included all functional nurses at the hospital, namely 94 people. We used a questionnaire for data collection, which included the identity of the respondent (gender, age, length of service, employment status), assessment of nurse competence, workload, application of the six patient safety goals, and patient safety incidents. Assessment of the questionnaire using a Likert scale. Questionnaires were distributed to the 94 nurses included in this study.

Each questionnaire question has a minimum score of 1 and a maximum score of 5. Each variable will be assessed for its index score. Scores of 18.8–43.86 were declared low; scores of 43.87–68.93 were declared moderate; and scores of 68.94–94 were declared high.

We use SPSS version 26 for data analysis. This research method is analytic research with a cross-sectional approach. The research method uses the path analysis research model. Data analysis consisted of descriptive analysis, multiple linear regression, three box method analysis, and classic assumption test, which consisted of normality test, multicollinearity test, heteroscedasticity test, determinant coefficient test, hypothesis testing using F test, and partial t-test.

RESULTS AND CONCLUSIONS

This study comprised 94 respondents who were nurses at a hospital in Tangerang. Of the 94 respondents who took part in this study, most were aged 21–30 years, namely 53 respondents (56.4%), followed by the age group 31–40 years with 33 respondents (35.1%), and the age group > 40 years with eight respondents (8.4%).

Table 1 Characteristics of Respondents

Variable	Frequency (n=94)	Percentage (%)
Age		
17-20 year	0	0
21-30 year	53	56,4
31-40 year	33	35,1
>40 year	8	8,4
Duration of Work		
<1 year	21	22,3
1-4 year	38	40,4
5-7 year	34	36,2
>7 year	1	1,1
Working Position		
Head nurse	7	7,4
Head of the polyclinic nurse	5	5,3
Room nurse	43	45,7
Polyclinic nurse	39	41,5

Based on the length of work, most have worked 1-4 years, with a total of 38 respondents (40.4%), and the least are those who have worked for more than seven years, namely with a total of 1 respondent (1.1%) Based on position work, 94 nurses were respondents, ward nurses were the positions that had the most number of nurses, namely 43 nurses (45.7%), while the least were head poly nurses, namely five nurses (5.3%) (Table 1)

In this study, r-table and r-count values are needed to measure a statement's validity. Measurement r-table with a sample of 15, the value of df (n-2) is 13, with an r-table of 0.553. So useful statement items are statement items that have a corrected total item correlation value greater than 0.553.

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Our questionnaire has the results of the validity coefficient of all research questionnaire items having an r count value greater than the r table (0.553), so all questionnaires are declared valid. And a questionnaire with valid results means that research statements can be used as a data collection tool to measure variables.

Based on the answers of 15 respondents to Nurse Competency (X1), Workload (X2), Implementation of 6 Patient Safety Goals (X3) and Patient Safety Incidents (Y) are presented in the table below:

Nurse Competency

Based on table 2, it can be concluded that all question items X1 are valid because the value of the r count is greater than the r table.

Table 2. X1 Validity Test

No	R count	R table	Information
A1	0,689	0,553	Valid
A2	0,773	0,553	Valid
A3	0,770	0,553	Valid
A4	0,635	0,553	Valid
A5	0,715	0,553	Valid
A6	0,675	0,553	Valid
A7	0,749	0,553	Valid
A8	0,860	0,553	Valid
A9	0,889	0,553	Valid
A10	0,766	0,553	Valid
A11	0,569	0,553	Valid
A12	0,884	0,553	Valid
A13	0,845	0,553	Valid
A14	0,720	0,553	Valid
A15	0,767	0,553	Valid
A16	0,723	0,553	Valid
A17	0,799	0,553	Valid
A18	0,761	0,553	Valid
A19	0,786	0,553	Valid
A20	0,742	0,553	Valid
A21	0,756	0,553	Valid
A22	0,682	0,553	Valid
A23	0,724	0,553	Valid
A24	0,732	0,553	Valid
A25	0,913	0,553	Valid

Workload

Based on table 3, it can be concluded that all question items X2 are valid because the value of the r count is greater than the r table.

Table 3. X2 Validity Test

No	R count	R table	Information
B1	0,732	0,553	Valid
B2	0,928	0,553	Valid
B3	0,759	0,553	Valid
B4	0,781	0,553	Valid
B5	0,566	0,553	Valid
B6	0,647	0,553	Valid
B7	0,898	0,553	Valid
B8	0,812	0,553	Valid

Implementation of the 6 Patient Safety Goals

Based on table 4, it can be concluded that all question items X3 are valid because the value of the r count is greater than the r table.

Table 4. X3 Validity Test

No	R count	R table	Information
C1	0,640	0,553	Valid
C2	0,788	0,553	Valid
C3	0,586	0,553	Valid
C4	0,589	0,553	Valid
C5	0,743	0,553	Valid
C6	0,583	0,553	Valid
C7	0,691	0,553	Valid
C8	0,591	0,553	Valid
C9	0,666	0,553	Valid
C10	0,710	0,553	Valid
C11	0,722	0,553	Valid
C12	0,554	0,553	Valid
C13	0,746	0,553	Valid
C14	0,909	0,553	Valid

Patient Safety Incidents

Based on table 5, it can be concluded that all question items Y are valid because the value of the r count is greater than the r table.

Table 5. Y validity test

No	R count	R table	Information
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D1	0,616	0,553	Valid
D2	0,563	0,553	Valid
D3	0,606	0,553	Valid
D4	0,599	0,553	Valid
D5	0,647	0,553	Valid
D6	0,582	0,553	Valid
D7	0,629	0,553	Valid
D8	0,626	0,553	Valid
D9	0,566	0,553	Valid
D10	0,602	0,553	Valid
D11	0,633	0,553	Valid
D12	0,546	0,553	Valid
D13	0,568	0,553	Valid
D14	0,622	0,553	Valid
D15	0,646	0,553	Valid
D16	0,641	0,553	Valid
D17	0,582	0,553	Valid
D18	0,638	0,553	Valid
D19	0,618	0,553	Valid
D20	0,554	0,553	Valid
D22	0,624	0,553	Valid
D23	0,580	0,553	Valid
D24	0,581	0,553	Valid
D25	0,603	0,553	Valid
D26	0,643	0,553	Valid
D27	0,605	0,553	Valid
D28	0,604	0,553	Valid

Furthermore, the reliability test was carried out using Cronbach's alpha. Reliability is a tool for measuring a questionnaire, an indicator of a variable. A questionnaire is reliable if the respondents' answers to these statements are consistent or stable occasionally. Testing with the criteria of if r count 0.60 means it is unreliable and if r count > 0.60 means it is reliable, as shown in the table below:

Table 6. Reliability Test

Variable	Cronbach Alpha	Information
X1 (Nurse competency)	0,964	Reliable
X2 (Workload)	0,888	Reliable
X3 (Implementation of the six goals of safety)	0,938	Reliable
Y (Patient safety incident)	0,910	Reliable

Based on table 6, our reliable questionnaire can be used for this study. After that, we conducted hypothesis testing based on path analysis.

Table 7 Research Variable Assessment Matrix

Variable	Category			Behaviour
	Low	Medium	High	
Nurse competence		v		Nurse competencies need to be continuously updated and improved to receive more knowledge, which is useful for applying the six patient safety goals that affect patient safety incidents.
Workload			v	The cause of the workload must be identified immediately, and a solution must be provided to reduce the workload.
Implementation of the 6 Patient Safety Goals			v	The implementation of the six patient safety goals must be maintained to reduce patient safety incidents.
Patient safety incident		v		Monitoring and evaluating patient safety incidents are required to reduce patient safety incidents.

Based on Table 7, the nurse's competency index score is 58.19, which is in the moderate category. The competence of nurses in this hospital is moderate, and more have PK I competencies compared to PK II, III, IV, and V.

The workload index score of this study was 72.76, which is in the high category. It can be concluded that the nurses' workload in this study was high. The index score for applying the six patient safety goals was 82.97 in the high category. The implementation of the six patient safety goals in this study is high.

The patient safety incident index score was 49.51. It can be concluded that the patient safety incident in this study was moderate.

Table 8. Bivariate Test

Variable	Sig.	Information
X1-Y	0,396	H0 is accepted
X2-Y	0,761	H0 is accepted
X3-Y	0,781	H0 is accepted

Table 9. Bivariate Test on Intervening

Variable	Sig.	Information
X1-X3	0,000	H0 is rejected
X2-X3	0,000	H0 is rejected

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Based on tables 8 and 9, it can be concluded that:

- H1: Workload has a significant negative effect on patient safety incidents. If the workload is high, patient safety incidents will increase.
- H2: Nurse competence has a significant negative effect on patient safety incidents. If nurse competence is low, patient safety incidents increase.
- H3: Workload significantly influences the implementation of the six patient safety goals.
- H4: Nurse competence has a significant influence on the implementation of the six patient safety goals.
- H5: Implementation of the six patient safety goals significantly negatively affects patient safety incidents. If the implementation of the six patient safety goals is low, then patient safety incidents will increase.
- H6: There is a significant influence between nurse competence, workload, and the implementation of the six patient safety goals on patient safety incidents.

Our results show an influence between workload and implementing the six patient safety goals. This is consistent with the results of this study, which show a relationship between the workload of nurses and the implementation of the six safety goals. These results align with the research, which also shows a relationship between workload and the implementation of the six patient safety goals (Rabita et al., 2022). Research found a significant relationship between nurse workload and implementing the six patient safety goals (Astriana & Sidin, 2014).

Patient safety implementation can add to nurses' tasks, so there must be accountability in keeping patients safe. The additional tasks are carrying out patient identification compliance, increasing effective communication, increasing awareness of high-alert drugs, ensuring the right location, right procedure, and right patient surgery, reducing the risk of infection related to health services, and reducing the risk of falling patients (Retnaningsih & Fatmawati, 2018).

A workload that is too excessive will cause various effects, namely physical and mental fatigue and emotional reactions such as headaches, indigestion, negligence, forgetfulness, and irritability, so it is potentially harmful to workers or nurses (Indrawati & Tahjoo, 2022).

The impact is that nurses can forget to identify patients, can write wrong instructions, can give the wrong medicines, or even not pay attention to steps to prevent the risk of infection and reduce the risk of falling patients. which will eventually produce negative effects on the patient, namely side effects and failure to save the patient (Ross et al., 2019). The higher the workload, the lower the application of patient safety indicators (Taqwim et al., 2020).

Likewise, the workload of nurses will affect patient safety incidents. In accordance with the results of this study, which show that workload negatively influences

patient safety incidents, studies that assess the direct relationship between nurse workload and patient safety incidents are scarce. Showed no relationship between workload, KNC and KTD (Andhini et al., 2022). Showed that workload affects patient safety incidents through intermediary communication between patient workers (Adriansyah et al., 2021). A high workload can reduce the level of communication between nurses, which can cause patient safety incidents. In addition, Taqwim et al. (2020) also assessed that workload was negatively correlated with the application of patient safety indicators ($p=0.005$), where the higher the workload, the lower the application of patient safety indicators with low correlation strength ($r: -0.361$). Excessive workload will cause various effects, namely physical-mental fatigue and emotional reactions such as headaches, negligence, forgetfulness, and irritability, which can potentially endanger staff and cause patient safety incidents (Adriansyah et al., 2021).

Several other factors that influence patient safety incidents but were not examined in this study can also affect patient safety incidents. For example, it can be caused by nurses who lack responsibility on the part of the individual nurses themselves.

In addition to workload, our results also show that nurse competence influences the implementation of the six patient safety goals. A nurse providing nursing care must have the right knowledge, skills, and attitudes to deal with the complexities of health care, as evidenced by the level of nurse competence. Without adequate knowledge, health workers, including nurses, cannot implement and maintain a patient safety culture in implementing the six patient safety goals (Myers, 2011).

The results of this study are in line with, where research proved that competence correlated positively with the application of patient safety indicators that affect patient safety incidents, where the higher the competence of nurses, the higher the application of patient safety indicators, so that patient safety incidents also decreased (Taqwim et al., 2020). The higher the nurse's competency, the more significant the knowledge about patient safety principles can improve the application of the six patient safety goals (Alquwez et al., 2019). In addition, many other factors may affect implementation of the six patient safety goals, which were not examined in this study. Job satisfaction, for example, could suffer. People with a high level of job satisfaction show a positive attitude towards their work, but people who are dissatisfied with it show a negative attitude towards their work. If nurses are satisfied with their work, they are likely to give their best in what they do related to their work, one of which is the implementation of the six patient safety goals.

Nurse competence also influences patient safety incidents. These results align with previous research, which concluded that the higher a person's competence, the lower the occurrence of patient safety incidents (Friyanti, 2018). Nurse competence influences patient safety in nursing activities. Patient safety competence refers to the attitudes, skills, and knowledge health workers must have to protect patients from unnecessary risk and harm [Huh]. The higher a person's education level, the greater the nurse's knowledge. The higher a person's level of knowledge, the more competent he will be in carrying out

his work. He will increase his ability to implement higher patient safety to prevent patient safety incidents from occurring.

However, despite low competence, not all nurses with low competence will often cause patient safety incidents. Nurses with low competence may feel a strong sense of responsibility in carrying out the six patient safety goals. So that not only nurses with high competence but also nurses with low competence have a good patient safety culture. The patient safety incident is reduced when the six patient safety goals are met to a high degree. Nurses' work motivation can also influence Research shows a relationship between competence and work motivation in nursing. The higher the competence, the higher the work motivation of nurses, which will impact patient safety incidents (Dumai et al., 2021).

Finally, directly implementing the six patient safety goals will affect patient safety incidents. The more patient safety goals that are met, the fewer patient safety incidents there will be (Ayunda, 2019). Currently, research on the effect of implementing the six patient safety goals on patient safety incidents is still scarce. However, one study is in line with the results of this study, which found that the higher the application of patient safety indicators in hospitals, the lower the patient safety incident rate (Isclawati & Majid, 2020). Supervision is a critical factor in the successful implementation of patient safety goals in order to create a culture of patient safety and, ultimately, achieve patient safety. the hospital always to improve the quality of supervision carried out by the head nurse in implementing the six goals of patient safety. This supervision is carried out periodically or routinely to monitor how the six patient safety goals are carried out and strengthen the relationship between the head/head of the room and the implementing nurse (Suryani et al., 2021).

CONCLUSION

Based on the results of the analysis and discussion that have been described, it can be concluded that: 1) There is an influence between the workload of nurses and the implementation of the six patient safety goals. If the nurse's workload is high, the implementation of the six patient safety goals will decrease. 2) There is an influence between workload and patient safety incidents. Thus, reducing the workload of nurses can reduce patient safety incidents. 3) There is an influence between the competence of nurses and the implementation of the six patient safety goals. If the nurse's competence is high, the application of the six patient safety goals will also increase. 4) There is a link between nurse competence and patient safety incidents. If the competence of nurses is low, it will increase patient safety incidents. 5) There is an influence between implementing the six patient safety goals and patient safety incidents. If implementing the six patient safety goals is low, patient safety incidents will increase. 6) Together, workload, nurse competence, and implementation of the six patient safety goals significantly influence patient safety incidents. If the workload is low, nurse competence is high, and applying the six patient safety goals is high, it will reduce patient safety incidents.

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