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Research Article

Factors Relating to Patient Safety Competencies in D3 Nursing Students

Silvana Evi Linda*

*Akper Bina Insan
Jakarta, Indonesia

***contact**

silvana.evilinda@gmail.com

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Abstract

Aims: to identify factors related to competency regarding patient safety among D3 nursing students in Jakarta.

Methods: this research will use a cross-sectional design. The research will be carried out at the nursing academy in Jakarta. The sample in this study were level 3 D3 nursing students. The questionnaire was used to measure patient safety competency, knowledge and attitudes. Data analysis was carried out using linear regression techniques.

Results: The study reveals that D3 nursing students have a strong patient safety competency score, with a moderate positive correlation between knowledge and competency. Attitudes also play a significant role, with a positive correlation of 91.9%. Age and education influence attitudes, affecting compliance.

Conclusions: Attitude variable significantly influences patient safety competency in D3 nursing students, indicating the need for comprehensive research and increased education to enhance clinical safety.

Keywords:

Competence; Knowledge; Nursing Students; Patient safety; Student

INTRODUCTION

Nursing students often make mistakes that are dangerous for themselves and patients due to lack of clinical experience (1). The first study on patient safety in Indonesia was carried out in 2000 by looking at 4500 medical records from 15 hospitals. Results show a wide range of incidents; for example, the incidence of misdiagnosis ranged from 8.0% to 98.2%, and the incidence of prescribing errors ranged from 4.1% to 91.6%. There were 171 fatalities, 80 serious injuries, 372 moderate injuries, 1183 minor injuries, and 5659 cases without injuries reported from a total of 7,465 patient safety incidents in Indonesia in 2019. Meanwhile, of the 2,877 accredited hospitals in Indonesia, only 12% of patient safety incidents occurred. have been reported, with a total of 7,465.

Students often exhibit near misses because they fail to follow the three main patient safety protocols namely: (1) validating 6 correct medication administration; (2) verifying the patient's identity; and (3) reviewing the patient's allergy status (1). Despite knowing the consequences, nursing students sometimes fail to disclose mistakes (2). Previous studies found that many nursing students hide mistakes for fear of repercussions from lecturers and peers (3). Nursing students often fail to disclose errors for fear of consequences or because they do not realize the severity of the problem (4).

Additionally, a survey conducted at nursing institutions found that 55% of schools reported having no clear standardized policies for handling nursing student errors in patient safety incidents, or methods for

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students to report such incidents (3). Failure to properly verify patient identity is a common cause of medical errors (5). According to a recent study, approximately 40% of Belgian baccalaureate nursing students experienced patient safety incidents during clinical rotations (6).

In Indonesia, patient safety incidents were reported to be higher in 2022. Of the total 7,465 patient safety incidents, 171 people died, 80 people were seriously injured, 372 people were injured, 1183 people were injured, and 5659 people were not injured. Reported patient safety incidents were only 12%, even though in Indonesia there are 2,877 accredited hospitals. A study in Indonesia reported that 4500 medical records from 15 institutions. As the data shows, the frequency of adverse events occurs over a wide range. For example, diagnostic error rates varied from 8.0% to 98.2%, and prescription error rates ranged from 4.1% to 91.6%. Evidence about patient safety in Indonesia has been growing even though there has been no national research on this matter (7). However, studies on reporting of patient safety incidents among nursing students are still lacking, even considered high, this may be due to lack of reporting or fear of many consequences. In addition, patient safety culture and competencies among nursing students in Indonesia are poorly understood. So the aim of this research is to identify the factors that are most related to the patient safety competency of D3 nursing students.

METHODS

Study design

This research is a quantitative method with a descriptive analysis approach. This research uses a cross sectional study research design (Cross Sectional Study) where data regarding the independent variable and dependent variable are collected at the same time (8).

Samples

The sample procedure employed was random sampling. The estimated sample

measurements were computed using G.Power software version 3.1.9.7, employing the F test for linear multiple regression with a fixed model. The calculations were based on an effect size of 0.15, an error probability (α) of 0.02, a power of 0.95, and a total of 2 predictors. The minimum predicted sample size is 125, accounting for an attrition rate of 10-15%. Therefore, the total sample size required is 128 respondents.

The inclusion criteria for this study are: Have passed the "Basics of Nursing" course, have started studying in a clinical environment, and are not working. The exclusion criteria were students who did not fill out the questionnaire.

Instruments

The questionnaire used to measure patient safety competency is The Health Professional Education In Patient Safety Survey (H-PEPSS). This questionnaire has 23 questions, 6 domain questions working in a team, 3 domain questions effective communication, 3 domain questions managing safety risks, 3 domain questions understanding human and environmental factors, 4 domain questions recognizing and responding to adverse events, and 4 domain questions safety culture. Scoring uses the 1 scale Scoring uses a Linkert scale of 1-5. The validity and reliability of this questionnaire are 0.81 and 0.85 (6).

The questionnaire used to measure student knowledge uses the patient safety knowledge questionnaire. Consisting of 30 questions, with 2 choices of right and wrong, if the respondent's answer is correct they are given a score of 1 and wrong they are given a score of 0.

The questionnaire used to measure student attitudes uses the Attitudes to Patient Safety Questionnaire (APSQ-III) questionnaire consisting of 26 questions with scoring. using a Linkert scale of 1-5. The validity and reliability of this questionnaire is 0.695 (9).

Analysis data

The employed approaches encompass data processing and hypothesis testing. The univariate analysis conducted includes calculations of the mean, standard deviation, minimum value, and maximum value. The Pearson correlation test was utilized for bivariate analysis, whereas linear regression was employed for

multivariate analysis. The statistical tests have yielded results, including the statistical test values and the degree of significance (p-value). These values are then compared to the α value (0.05). The hypothesis is considered accepted if the p-value is less than the significance level α (0.05). The test employed utilizes IBM SPSS statistics software version 23.

RESULTS

Table 1. Frequency Distribution Based on Gender, Age, Ethnicity (n = 128)

Characteristic	n(%)
Gender	
Woman	70 (53%)
Man	58 (43.9%)
Age in years (Mean \pm SD)	20.84 \pm 0.76
Ethnic group	90 (68.2%)
Betawi	22 (16.7%)
Sunda	16 (12.1%)

Based on table 1 above, it shows that women dominate more than men (70%). The average age of respondents was 20.84 years (SD= 0.76) and most respondents came from the Betawi tribe (68.2%).

Table 2. Descriptive Analysis Based on Total Patient Safety Competencies, Knowledge and Attitudes (n = 128)

Variable	Mean \pm SD	Minimum- Maximum
Total patient safety competency	65.95 \pm 17.64	46-92
Score domain		
Team work	17.20 \pm 4.60	12-24
Effective communication	8.60 \pm 2.30	6-12
Manage safety risks	8.60 \pm 2.30	6-12
Human and environmental factors	8.60 \pm 2.30	6-12
Respond to adverse events	11.50 \pm 3.09	8-16
Safety culture	11.50 \pm 3.09	8-16
Total knowledge score	29.36 \pm 1.15	25-30
Total attitude score	74.34 \pm 20.04	52-104

Based on table 2 above, it shows that the average of the total patient safety competency score is 65.95 (SD= 17.64; range 56-92), the highest score domain is teamwork 17.20 (SD= 4.60; range 12- 24) followed by the domain of responding to adverse events and safety culture 11.50 (SD= 3.09; range 8-16), and the lowest score was the domain of effective communication, managing safety risks, and human and environmental factors 8.60 (SD= 2.30; range 6-12). The mean total score for knowledge was 29.36 (SD= 1.15; range 25-30). The average total score for attitudes was 74.34 (SD= 20.04; range 52-104).

Table 3. Relationship between Demographic Data and Patient Safety Competency (n = 128)

Variable	Patient Safety competence Mean ± SD
Gender	
Woman	65.06±17.05
Man	67.02±18.42
Age in years (Mean ± SD)	20.84±0.76
Ethnic group	
Betawi	64.4±18.3
Sunda	65.86±17.64
Batak	75.75±17.81

Based on table 3, the results of bivariate analysis with independent t test and One-Way ANOVA show that the relationship between gender and ethnicity and patient safety competency is not significantly related (p-value > 0.05). However, age and patient safety competency have a significant relationship with a p-value of 0.000 (p-value < 0.05).

Table 4. Relationship between Patient Safety Competency and Knowledge and Attitude (n = 128)

Variable	Total score r / p-value	Domain Skor					
		Team work r / p-value	Effective communication r / p-value	Risk management r / p-value	Human and environment r / p-value	Facing the bad situation r / p-value	Safety culture r / p-value
Knowledge		0.427***	0.427***	0.427***	0.427***	0.430***	0.430***
Attitude		0.993***	0.993***	0.993***	0.993***	0.987***	0.987***

Note : *** p < 0.01, **p < 0.05, *p < 0.1

Based on table 4, the results of bivariate analysis using Pearson correlation show that the total research results of patient safety competency scores, teamwork domains, effective communication, and managing safety risks with knowledge are significantly related to 0.000 (p-value < 0.05) with a coefficient value of 0.427. The research results of the domain responding to adverse events and safety culture with knowledge were significantly related at 0.000 (p-value < 0.05) with a coefficient value of 0.430. The results of the research were that the total competency scores for patient safety, teamwork domains, effective communication, and managing safety risks and attitudes were significantly related to 0.000 (p-value < 0.05) with a coefficient value of 0.993. The research results of the domain responding to adverse events and safety culture with knowledge were significantly related at 0.000 (p-value < 0.05) with a coefficient value of 0.987.

Table 5. Factors Associated with Patient Safety Competency in D3 Nursing Students (n = 350)

	B	SE	Beta	T	p-value
Knowledge	0.156	0.170	0.010	0.918	0.361
Attitude	0.837	0.017	0.951	47.85	0.000
age	1.027	0.458	0.044	2.243	0.027

Based on table 5, the results of multivariate analysis using linear regression show that knowledge, attitudes and age explain 98.7% ($R^2 = 0.987$), meaning they have a contribution of 98.7% to patient safety competency and are statistically significant with a p-value <0.05 .

DISCUSSION

Based on the research results, the average total patient safety competency score was 65.95 (SD= 17.64; range 56-92), close to the maximum value. The results of this study indicate that the patient safety competency of D3 nursing students is in the good category. The results of a similar study conducted by Baihaqi (10) stated that the implementation of patient safety in the patient safety implementation category was good as many as 69 people (86.3%). This shows that patient safety competency is in the good category, while also showing that some respondents have carried out patient safety well.

Based on the research results, the average total knowledge score was 29.36 (SD= 1.15; range 25-30), close to the maximum value. The results of this study indicate that the knowledge of D3 nursing students is in the high knowledge category. The results of a similar study conducted by Djariah (11) showed that 90 nurses (92.8%) had high knowledge about patient safety if the nurse obtained an average answer score of $\geq 50\%$ and the nurse understood the concept of patient safety which includes the definition, goals, patient safety standards, patient safety targets, and nursing actions that support patient safety. This shows that the knowledge of students in D3 nursing is in the high knowledge category.

Knowledge is the outcome of the cognitive process of "knowing," which occurs whenever an individual senses an object. This perception occurs through the five human senses. Cognitive ability is a crucial aspect in the development of an individual's motor skills. Notoadmodjo (12). The knowledge is influenced by factors such as educational attainment, cultural understanding, and personal experience Notoatmodjo (13). Experience is acquired by the process of recalling information, which encompasses the intentional or inadvertent recollection of past events, triggered by an individual's interaction with or observation of an item. The majority of human information is acquired by visual and auditory perception (14).

The research findings indicate that the mean total attitude score was 74.34, with a standard deviation of 20.04 and a range of 52 to 104. The findings of this study suggest that the attitudes of D3 nursing students fall within the favorable group. The findings of a related study carried out by Djariah et al (11) indicate that 97 out of 95 nurses (97.9%) exhibit a positive work attitude when they achieve a score of $\geq 62.5\%$ and demonstrate knowledge and responsiveness in managing patient safety objectives. Attitude refers to a preexisting inclination to react to external stimuli, which can influence or direct an individual's actions. Attitude, in essence, refers to a mental and emotional disposition that is primed to react to a stimulus based on past experiences and other factors, ultimately shaping one's behavior and actions. Attitude is a type of assessment or emotional response (12).

Attitudes exert influence on an individual's behavior by means of a comprehensive and rational decision-making process. This influence manifests in the following ways: firstly, a particular attitude towards something determines behavior; secondly, behavior is influenced not only by attitudes, but also by subjective norms, which refer to our beliefs regarding what others expect us to do; thirdly, attitudes towards behavior, in conjunction with subjective norms, shape an intention to behave in a specific manner. Habits, generally referred to as social attitudes, are certain attitudes that are consistently expressed in the same activity (14).

According to the research findings, the Pearson correlation statistical test yielded a correlation coefficient (r) of 0.427 and a p -value of 0.000, which is less than the significance level of 0.05. The research findings indicate a notable correlation between knowledge and patient safety competency, with a favorable direction of association. Increased knowledge positively correlates with improved patient safety, however the strength of the association is moderate. Researchers posit that information is a significant determinant of patient safety competency. A strong knowledge base enables students to develop critical understanding and thinking skills, facilitating the effective implementation of patient safety measures.

This research is in line with research by Sari (15) which states that there is a significant relationship between knowledge and the implementation of patient safety p -value $0.000 < (0.05)$. In providing nursing care, a nurse must have the correct knowledge, attitude and skills in handling patients. If nurses do not have adequate knowledge, all health workers including nurses will not be able to maintain and implement patient safety. In providing nursing care, a nurse must have the correct knowledge, attitude and skills in handling patients. If nurses do not have adequate knowledge, all health workers including nurses will not be able to

maintain and implement patient safety. In implementing patient safety, good knowledge is needed in order to improve skills. If the nurse's knowledge is lacking, it can cause the implementation of patient safety to be poor.

Apart from that, this research is also in line with research by Baihaqi (10) which states that the results of statistical tests using the Chi Square test obtained a p -value = 0.000 with a quite strong contingency coefficient value (0.465), which can be interpreted as a p -value < 0.05 so H_a is accepted and H_o is rejected. So it can be concluded that there is a significant relationship between nurses' knowledge and the implementation of patient safety. Where the strength of the relationship between the two variables is 46.5%. Knowledge about patient safety programs in hospitals is something that is very important because the more knowledge someone has, the different their perception about patient safety will be compared to someone who has little knowledge. The higher the nurse's knowledge, the more they comply with regulations to prevent unwanted events. Therefore, health workers, especially nurses, must update their knowledge by continuing further education programs and participating in regular training.

According to the research, the Pearson correlation statistical test yielded a correlation coefficient (r) of 0.993 and a p -value of 0.000, which is less than 0.05. The research findings indicate a notable correlation between attitude and patient safety competency, with a favorable direction of correlation. The patient's safety behavior and the strength of the relationship improve in direct proportion to the quality of the attitude. Attitude refers to an individual's emotional or cognitive response to a stimuli or object. Attitude encompasses four distinct levels: the capacity to receive (receiving), the ability to respond (responding), the act of appreciating (valuing), and the state of being responsible (responsible). The

behavior of humans is highly intricate and encompasses a broad range of phenomena. The development of a novel behavior, particularly in adults, originates from the cognitive realm, where the individual initially perceives the stimulus in the form of tangible or external entities, thus leading to the acquisition of fresh knowledge and attitudes by the individual (11).

This study aligns with the research conducted by Aminayanti (16), which asserts that attitudes have a concurrent impact on the execution of patient safety ($p=0.000$). Therefore, H1 is confirmed. These data demonstrate that the R Square value of 0.919 signifies that attitude has a significant impact of 91.9% on the implementation of patient safety. The study findings indicate a positive correlation between Attitude score and Implementation of Patient Safety, suggesting that higher Attitude scores are associated with higher levels of implementation. Dzulhidayat (2022) conducted a study that found a strong association between nurses' attitudes and the implementation of patient safety targets at Abdul Manap Hospital, Jambi City. The analysis yielded a p-value of 0.000, indicating statistical significance. The establishment of patient safety within the hospital setting is inherently intertwined with the demeanor of nurses who provide continuous care to patients. The attitudes of nurses possess several aspects that guide their implementation of patient safety objectives, which hospitals must prioritize in order to prevent patient safety events. A requisite disposition is necessary to elicit conduct that manifests as exemplary service quality in the provision of healthcare services.

The nurse's attitude in implementing patient safety is highly influential. Adopting a favorable outlook on injury prevention can enhance the safety of patients. The effectiveness of patient safety implementation is closely linked to the attitude of nurses responsible for its implementation. Nurses with a positive attitude towards patient safety tend to

perform better in achieving patient safety targets, whereas those with a less positive attitude tend to perform less effectively (Dzulhidayat, 2022). The research findings indicate that the Pearson correlation statistical test yielded a correlation coefficient (r) of 0.866 and a p-value of $0.000 < (0.05)$.

The results of the research show that there is a significant relationship between age and patient safety competency with a positive relationship direction. The older the age, the more patient safety will increase and the strength of the relationship will be perfect. Researchers are of the opinion that the majority of D3 nursing students are in the young adult or productive age category. Meanwhile, middle adults aged 41-60 years experienced a decrease in compliance with patient safety guidelines. This could be caused by other factors outside of individual characteristics, such as motivation, which can indirectly influence nurses in middle adulthood.

Based on the results of a multivariate test using a linear regression test, the attitude variable is the most dominant variable related to the patient safety competency of D3 nursing students with a p value of 0.000. Individuals will react to a problem they face depending on the knowledge they have. Attitude is a collection of cognitive, affective and conative components that interact with each other and understand, feel and behave towards an object (17). Attitudes are greatly influenced by the level of education where an educated person will have more good attitudes because education is one of the main requirements for building knowledge and forming attitudes (18).

Attitudes are subject to modification based on the surrounding environmental circumstances. These attitudes are manifested in three distinct domains: affect, which encompasses emotions such as happiness and unhappiness; behavior, which involves actions that correspond to these emotions, such as approaching or avoiding; and cognition, which entails the evaluation of the object of the attitude as

either positive or negative (19). Attitude has a crucial role in shaping behavior, as it is closely linked to perception, personality, and motivation. According to behavioral theory, attitudes affect a person's behavior through a deliberate and rational decision-making process. This influence is restricted to three factors: (1) Behavior is more influenced by specific attitudes towards something rather than general attitudes; (2) Behavior is not only influenced by attitudes, but also by subjective norms, which are beliefs about what others expect us to do; and (3) attitudes towards behavior, combined with subjective norms, shape the intention to behave in a particular manner (20).

Study limitation

In carrying out the research that has been carried out, of course there are several limitations during implementation, including: this research design uses a cross-sectional study which only examines the short term, this study cannot be used to analyze patient safety competencies in the long term. The results in this study are still limited because almost all respondents come from the Betawi tribe. There are only three research sites so that D3 nursing D3 students in Jakarta are generally weak. Even though it can still be generalized due to the adequate number of respondents, the research site has only three schools. The generalizing power may be weak.

CONCLUSION

Based on the results of multivariate tests using linear regression tests, the attitude variable is the most dominant variable related to the patient safety competency of D3 nursing students with a p value of 0.000. It is hoped that this research can be a reference for coss sectional study research and can develop variables that are expected to provide a detailed explanation of factors related to patient safety competency in D3 nursing students. Researchers hope that schools can conduct learning about patient safety competencies for nursing students so

that they can increase students' knowledge about patient safety competencies so that they can care more about and improve patient safety in the clinical environment.

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