The Effectiveness of Procalysis Mobile to Patient Safety Culture Improvement

Nurhasanah[1], Restu Yunus[1], Natasya Heryani[1], Windi Indah Saputri[1]
[1] Program Studi Administrasi Rumah Sakit STIKES Mutiara Mahakam, Samarinda, Indonesia

ARTICLE INFO	ABSTRACT
Keywords: Patient Safety, Culture, Hospital Improvement.	This study aimed to determine the effectiveness of Procalysis Mobile to improve the patient safety culture of hospital nurses in Samarinda City. This quasi-experimental research used a pretest-posttest control group design. The samples were 34 nurses that were divided into two groups. Group A received a Procalysis Mobile intervention, and group B received an intervention with a book of root cause analysis. The data were analyzed with an independent t-test. This study found that the p-value was 0.000 which means a significant difference between before and after the Procalysis Mobile intervention and the root cause analysis book intervention. Another result study was the mean value of the Procalysis Mobile intervention was higher (74.0) than the book intervention (38.0). The conclusion of this study was Procalysis Mobile has significantly different than a book intervention to patient safety culture improvement for nurses in hospitals.
Email : noa87mm@gmail.com restunyunus.ars@gmail.com natasyaheryani@gmail.com wj4004906@gmail.com	

1. INTRODUCTION

Hospital as a place for providing curative and rehabilitative health services have great potential in transmitting disease from patients to health workers or vice versa. Hospitals that are capital-intensive, labor-intensive, and technology-intensive have an obligation to provide health services while still paying attention to safety for patients and health workers. Therefore, a management system is needed so that health services for patients remain safe and of good quality [1,2].

Patient safety is a system where hospitals make patient care safer. Patient safety is an effort made in health services to prevent injury and inappropriate actions on patients. To build and maintain safe hospital services, patient safety culture is needed. Patient safety culture is a major step in improving patient safety in health care facilities. Patient safety culture has a significant relationship with the implementation of patient safety in hospitals. Patient safety culture has been shown to have a significant effect on the attitude of reporting incidents. Patient safety culture has a significant relationship with patient safety behavior [3,4,5,6].

The essence of patient safety culture was learn from mistake which usually called patient safety incidents. The Hospital Patient Safety Committee in Indonesia reported 877 incident reports. In 2015 until 2019 incident reports were 11.558 cases, and an increase in types of incidents was around 7 – 12%. Likewise, the number of hospitals reporting incidents increased by 7% in 2019 which was 12% compared to 2018 of 5%. The patient mortality rate due to incidents in 2019 was 171 cases. It makes a reduce trust in health care facilities, so that the tendency is for hospitals to only report incidents with minor injuries or no injuries [7,8].

Data shows that patient safety incidents occurred in 2.9% of hospitalized patients, as many as 6.6% of patients died. In fact, 53% of the total incidents was preventable. Other research suggests that 58% of incidents could have been prevented. Globally, as many as 4 out of 10 patients have an incident. Whereas 80% of incidents can actually be prevented. Efforts to prevent patient safety incidents can be

carried out through root cause analysis. Root Cause Analysis (RCA) is a method of solving problems through identifying the causal factors of a patient safety problem or incident. Finding the cause of the incident will lead to a decrease in patient safety incidents. Therefore, it is necessary to make massive efforts for RCA education to hospital staff to reduce incidents and improve patient safety culture in hospitals. Procalysis Mobile is an android-based application that aims to provide education related to root cause analysis in hospitals. Procalysis Mobile supports hospital digital transformation in Indonesia so that hospital staff can be more effectively and efficiently educated to improve the culture of patient safety in hospitals [9,10]. The purpose of the study was to determine the effectiveness of Procalysis Mobile in improving the patient safety culture at a hospital.

2. METHOD

The scope of this study covers the fields of hospital administration. The study was conducted at a hospital in Samarinda city in August 2022. This quasi-experimental research used a pretest-posttest control group design. The samples were 34 nurses that were divided into two groups. Group A received a Procalysis Mobile intervention, and group B received an intervention with a book of root cause analysis. The data were analyzed with an independent t-test.

3. RESULTS AND DISCUSSION

Based on the study that has been carried out aims to determine the effectiveness of Procalysis Mobile in improving the patient safety culture at a hospital with 34 respondents, the results of the study in the exposure below:

3.1. Respondent's Characteristics

Characteristics of respondents based on gender, age, and education, and length of work can be seen in Table 1.

Table 1. Characteristics of Respondents by Gender, Age, Education, and Length of Work

Variabels	f	%
Gender		
Man	13	40
Woman	21	60
Age		
Teenager (12-25 years old)	10	30
Adult (26-45 years old)	20	60
Elderly (>46 years old)	4	10
Education		
Nursing Diploma	21	63
Bachelor of Nursing and Profession	13	37
Length of Work		
<1 year	6	18
1-3 year	22	64
>3 year	6	18

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Based on table 1, it was found that the majority of respondents in this study were female (60%), adult (60%), had the highest education Nursing Diploma, and worked for 1-3 years (64%).

The characteristics of the respondents in this study were 40% male and 60% female. Differences in academic and work quality between men and women are not new and this is caused by many factors such as communication skills (11). Male nurses are more likely to be psychologically empowered than female nurses (12). However, Soeprodjo's research states that there is no significant relationship between gender and the quality of nurse performance (13).

Characteristics of respondents in the form of age showed that as many as 30% of respondents were teenagers, namely in the age range of 12-25 years, 60% of respondents were adults with an age range of 26-45 years, and 7% of respondents were elderly with age more than 46 years. The results of the study by Morika stated that there was no significant relationship between age and the performance of nurses in implementing patient safety in hospitals (14).

The educational characteristics of the respondents in this study consisted of 63% of respondents having the last education of Nursing Diploma and as many as 37% of respondents having the last education of Bachelor and Nursing Profession (Ners). The higher the level of education, the lower the error rate made by nurses and prevent deaths that occur in patients (15). However, another study stated that there was no significant relationship between the level of education and the performance of nurses in implementing patient safety in hospitals (14).

The characteristic of the last respondent is the length of work. As many as 18% of respondents have worked as nurses for less than 1 year. As many as 64% of respondents have worked as nurses for 1-3 years. As many as 18% of respondents have worked as nurses for more than 3 years. The length of work has a significant effect on the performance of nurses (16). Another study stated that the length of work had no effect on performance (14).

3.1. Different Patient Safety Culture Before and After Intervention

Characteristics of respondents by type The results of the analysis show that the data have a normal distribution using the Shapiro-Wilk test so the statistical test used in this comparative analysis is the independent sample t-test. Group A is the group that was given intervention in the form of Procalysis Mobile. Group B is the group given the root problem analysis book intervention. The results of the analysis of differences before and after the intervention in the two groups are set out in table 2 and table 3 below.

Table 2. Differences in Patient Safety Culture Levels in Group A Before and After the Procalysis Mobile Intervention

Level of Patient Safety Culture	Group A		p-value
	Pretest	Posttest	
Low	9 (52.9%)	2 (11.7%)	0.000
Middle	6 (35.3%)	3 (17.6%)	
High	2 (11.8%)	12 (70.7%)	

Based on the results of the analysis in table 2 above, it was found that before the Procalysis Mobile intervention was carried out, most of the respondents had a low culture of patient safety, which was 52.9%. However, after the Procalysis Mobile intervention, the number of respondents who have a low patient safety culture decreased to 11.7%. There was also a change in respondents who had a moderate patient safety culture before the intervention as much as 35.3% and then decreased to 17.6% after the intervention. Another change occurred in respondents who had a high patient safety culture before the intervention as much as 11.8% and increased to 70.7% after the Procalysis Mobile intervention. Statistical test shows that there is a difference in the average value with a p-value of 0.000.

Table 3. Differences in Patient Safety Culture Levels in Group B Before and After Book Intervention

Level of Patient Safety Culture	Group B		p-value
	Pretest	Posttest	
Low	8 (47.0%)	5 (29.4%)	0.004
Middle	6 (35.3%)	7 (41.2%)	
High	3 (17.7%)	5 (29.4%)	

Based on the results of the analysis in table 3 above, it was found that prior to the intervention of the Root Problem Analysis Book in the perspective of patient safety, most of the respondents had a low culture of patient safety, which was 47%. After the book intervention, the number of respondents who had a low patient safety culture decreased to 29.4%. In respondents who have a moderate patient safety culture before the book intervention, as much as 35%, an increase of 41.2% after the book intervention was carried out. Changes in respondents who have a high patient safety culture before the intervention as much as 17.7% increased to 29.4% after the book intervention. The statistical test showed that there was a difference in the average value with a p-value of 0.004.

The results of this study indicate that there is a significant difference in the mean between before and after the Procalysis Mobile intervention and the root cause analysis book. This result is similar to the research conducted by Novitasari, that the effectiveness of textbooks based on higher order thinking skills is valid, practical, and effective (17). Another study showed that teaching materials for disaster learning guide books in Klaten Regency were effective as indicated by an increase in learning outcomes through role playing strategies that was greater than conventional strategies, which increased by 30.24% (18). A similar study by Rielina showed that there were significant differences between students who studied conventionally and students who studied with pocket books in the competency unit for classification of spices and herbs. The use of pocket books in learning media is more effective in increasing students' knowledge compared to conventional learning (19).

3.3. Effectiveness if Procalysis Mobile to Patient Safety Culture's Improvement

Table 4. Differences in Patient Safety Culture After Intervention in Group A compared to Group B

Group	Mean	SD	p-value
A	74.0	2.2	0,000
B	38.0	2.9	

Based on the results of the analysis in table 4 above, it shows that the p-value is 0.000 which indicates that there is a significant difference between the provision of the Procalysis Mobile intervention and the provision of root cause analysis books. The mean value of the Procalysis Mobile intervention was higher (74.0) than the book intervention (38.0) so that it was found that the Procalysis Mobile intervention was more effective than the book intervention in improving the culture of patient safety for nurses in hospitals.

The mean value of the Procalysis Mobile intervention is higher than the mean value of the book intervention. This shows that Procalysis Mobile is more effective than conventional book giving in order to increase patient safety culture for nurses in hospitals. These results are in line with research conducted by Rosida (2017) that the use of interactive e-books is more effective in improving critical thinking skills compared to the use of conventional books (20). Another study by Akmal (2018) shows that there is an effectiveness of smartphone-based learning applications as a learning medium for the introduction of local history. This can be seen by the increase in post test scores after being given a mobile smartphone intervention (21).

4. CONCLUSION

The conclusion of this study was Procalysis Mobile has significantly different than a book intervention to patient safety culture improvement for nurses in hospitals.

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