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The Effect of using Android-Based Applications (E-Patient Safety) as a Dissemination Media For Nurses on Patient Safety Goals

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Abstract:- Patient safety is an essential part of nursing services and becomes an indicator of the quality of hospital services. Either of strategy in improving the quality of service by health workers especially nurses is through learning about patient safety goals.The form of learning media is used through an android application on a mobile smartphone. develop android application for patient safety goals learning by knowing the level of feasibility based on the assessment of material experts, media experts, and nures as a user. This study uses development method (Research and Development) which was adapted from the 4D model (Four D Model) which consists of four stages; define, design, develop, and disseminate. This research is a quasy experimental study with a one group pretest-posttest design. This research was conducted by giving pretest before being given intervention (use of android applications). The results of Assessment by nurses is assessed based on 3 aspects; system usefulness, aspects of information quality and interface quality aspects. Overall disemination media applications very well used by nurses (86,6%). The statistical results show that there is a significant influence between the level of understanding of nurses before and after being given intervention using the android application (e-patient safety) about patient safety learning (p-value 0.000). The implication of using e-patient safety in nursing is to get information and knowledge development effectively and efficiently with the results of increasing the competence of nurses in the hospital.

Keywords:- *Patient safety, Android Application, Dissemination Media, Nurses.*

I. INTRODUCTION

Patient safety is an essential part of nursing services and becomes an indicator of the quality of hospital services [1]. Either of strategy in improving the quality of service by health workers especially nurses is through learning about patient safety goals. Several studies have taken measurements of patient safety regarding reported patient safety at some hospitals in the world that have been accredited by J. C. Pham (2016) research which conducted in 11 hospitals from 5 countries found 52 incidents of patient safety that is Hongkong 31%, Australia 25%, India 23%, America 12% and Canada 10% [2]. While in Brazil the incidence of adverse events in hospitals is estimated at 7.6% [3]. From some of the research results obtained patient safety incidents are still widely found.

The impact that happens due to the hospital that does not apply patient safety is a decline in the hospital service quality. The research of Swift (2017) at US hospitals found that patients with adverse events resulted in a loss about $ 500,000 or insured $ 1 million per error. The research by Gerven et al (2016) stated that about 15% of health professionals were considering to leave their profession due to mistakes [4]. These are more likely to be experienced by nurses.

Based on and the impact that occurred, urgency is shown in the importance of understanding against patient safety goals. One form of strategy in minimizing this is through increase in socialization and dissemination of knowledge about patient safety goals The form of disemination media is used through an android application on a mobile smartphone [5].

Mobile phones in Indonesia in the era of industrial revolution 4.0. reached aroun 25% of the Indonesian population or approximately 90 million and it is will increase by six million every year. In the current revolution industrial 4.0, ownership of mobile phones with android application is increasing. The abdroid operating system is open source and has multitaksing capabilities to run multiple application at once [6]. The objectives to be achieved in this research to determine the feasibility of an Android-based dissemination media on good and effective patient safety for nurses.

II. METHODS

A. Research Design

This type of research was done by using research and development approach. The development model used as the basis in this development is the result of adaptation and modification from the development by 4D model (Four D Model) which consists of four stages, namely: 1) define; (2) design; (3) develop; and (4) disseminate in order to obtain development procedures as follows.

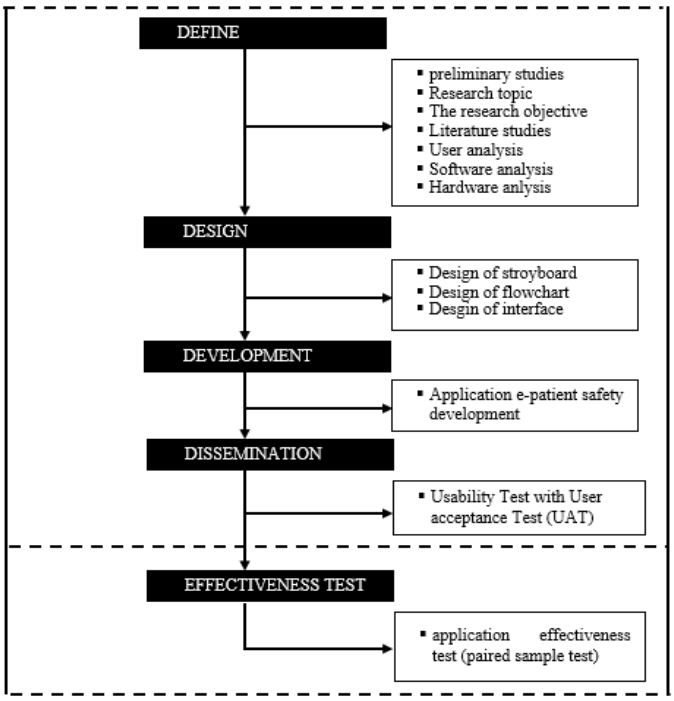

Fig 1:- Line of Reserach

This research is a quasy experimental study with a one group pretest-posttest design. This research was conducted by giving pretest before being given intervention (use of android applications). After intervened, then carried out posttest (See Figure 2).

Pretest	Intervention (Use of Android Application)	Posttest
P1	X	P2

Figure 2. One Group Pre-Test-Post-Test Design

B. Setting

This research was conducted at inpatient room Raden Mattaher Hospital, Jambi City, Indonesia. The research time is done in stages starting from June 2020 until October 2020.

C. Population and Sample

The population in this study are all the nurses who work in the inpatient room of Raden Mattaher Hospital. The sample was determined randomly by means of a proportional random sampling technique technique because all inpatient rooms have the same opportunity to be a sample of 203 nurses.

D. Population and Sample

The population in this study are all the nurses who work in the inpatient room of Raden Mattaher Hospital.The results of the calculation of the number of samples in this study were 203 nurses. The inclusion criteria for samples were; has a minimum work period of 3 months and is placed in an inpatient room, is willing to be a respondent and has an android mobile. Measurement of the sample size used proportional random sampling to select 203 nurses. After getting the number of samples in each inpatient room, the final sample selection in each inpatient room used simple random sampling technique.

E. Instrument

This study uses 2 instruments, as follows.

- Instrument Usability Questionnaire J.R Lewis

Instrument of J.R Lewis Usability Questionnaire consists of 19 questions and provides answer on a scale of 7. This questionnaire consists of 3 main factors; system usefulness (SYSUSE), information quality (INFOQUAL) and interface quality (INTERQUAL) [7][8]. This questionnaire is used to test the extent of the android application for dissemination science that has been developed can achieve goals effectively and efficiently and overall attractive to be used independently.

- Instrument of Android Application Effectiveness Test

To determine the changes of nurses learning outcomes in learning process after using the android-based (e-patient safety) consists of a pretest and posttest in the form of true and false statements. This instrument is developed based on SNARS 1st edition [9].

F. Data Collection

The data collection techniques used in the study are questionnaire. The instrument is used to find out the nurses opinion on the interview learning media that has been made intended to obtain a picture of the needs used to define the application to be made.

The instruments that will be used as data collection tools are questionnaires and tests to measure the knowledge level of nurses. The questionnaire will be carried out at the pretest and posttest evaluation stage of the product trial which will first be given to 4 experts who meet the requirements of both the material and the media in order to find out whether the product made can be judged feasible or not. The test results can be relied on to determine the effectiveness of the media being developed.

G. Data Analysis

The obtained data from the research results were processed and analyzed by using computerized statistic analysis. The data analysis techniques which will be used are descriptive statistics analysis and t test analysis. The analysis of descriptive statistics is used to analyze and describe the data that have been collected.

The paired sample test is used to measure the effectiveness of the product which aims to assess the extent of the influence of Android-based mobile learning dissemination media on increasing nurses' knowledge of patient safety. The data analyzed in this effectiveness test were the scores obtained from the test results both pretest and posttest and then analyzed using the t-test.

III. RESULTS AND DISCUSSION

A. The Results of Aplication Development

The results of this development are adapted and modified from the development of the 4D model (Four D Model) which consists of four stages; 1) define; (2) design; (3) develop; and (4) disseminate.

- The Results of Define Stage

The analysis phase consists of two stages: content analysis and needs analysis. The content analysis stage was carried out to identify material based on competence for patient safety. The materials taken are patient safety target material, patient safety standards, types of patient safety incidents and patient safety incident reporting flow.

- The Results of Design Stage

The design stage was conducted by making the navigation map and storyboard. The purpose of the navigation map is to provide an explanation on each section or sub-section of the navigation or button on the application. The goal of the storyboard is to provide an explanation of the narrative path in the application.

- The Results of Development Stage

The results of the final development of the application of media dissemination for patient safety goals. (See figure 3).

Fig 3:- Final Product of E-Patient Safety Application

B. The Results of User Acceptance Test

The results of user accpetance test (UAT) based on J.R Lewis Usability Questionnaire (See Table 1).

Table 1. The Result of User Acceptance Test

Usabilty Aspect	Percentage (%)	Category
System Usefulness	87,3	Very Feasible
Information Quality	86,0	Very Feasible
Interface Quality	95,9	Very Feasible
Overall	86,6	Very Feasible

Based on tabel 1, The results of nurses responses as users an average 86,6%. Overall android based application (e-patient safety) as a dissemination media is very well used by nurses.

C. The Results of Android Application Effectiveness Test

The results of the pre-test and post-test analysis using the Paired Sample Test (t-test). This is done to find out whether there is a significant difference between the average score of nurses before and after following the dissemination of knowledge using mobile learning media based on android (e-patient safety) (See table 2 and 3).

Table 2. Statistik Descriptive

	N	Mean	Std. Deviation	Std.Error Mean
Pretest	203	86,91	3,948	0,277
Posttest	203	93,86	1,730	0,121

Based on table 2, it is known the different mean results of the pre-test and post-test. The result of the mean score for the pre-test of nurses was 86.91, while the result of post-test for nurses was 93.86. This shows that the post-test score is better than the pre-test score (93.86> 86.91). In general, nurses experienced an increase in understanding by an average of 6 points. So that there is a difference in the mean value of the results of using the e-patient safety application as a media for disseminating patient safety by researchers.

Table 3. The Results of Paired Sample Test

	Paired Sampel Test						
	Mean	Std. Deviasi	95% CI		t	df	Sig. (2 tailed)
			Low	Up			
Pre-Post test	-6,946	4,205	-7,53	-6,36	-23,534	202	0,000

The next step is to analyze the pre-test and post-test values which were carried out by using the Paired Sample Test. This is done to find out whether there is a significant difference between the average score of nurses before and after following knowledge dissemination using android-based e-patient safety. Analysis t-test (Paired Sample Test) was carried out using computerized statistics with a confidence level of 95% or a significance of 0.05. The results of the Paired Sample Test are as shown in Table 3.

Based on the results of the Paired Samples Test, it is known that the t-count value is -23.534. The results show that the t-count is negative, so that the pre-test mean value is lower than the post-test mean value. Test statistics table shows that paired samples test result obtains significance value (2-tailed) 0.000 < 0.05 which means there is a significant influence between the level of understanding of nurses before and after being given intervention using the android application (e-patient safety) about patient safety learning. This shows that the application of e-patient safety is very effective as a medium for disseminating knowledge for nurses at hospital.

This is in line with the research results Arsyad & Lestrai (2018) which conclude that is a significant difference between learning outcomes before and after the application of Android-based mobile learning media (p-value 0,000) [10]. This research also line ini with the research results W Kusmaryani, B Musthafa & P Purnawarman (2019) which conclude that mobile applications used as learning assistance positively optimized [11]. The research results Musahrain (2016) the calculation result of the t-test in operational field try-out is that Ho is confirmed, which means that the scores of the pretest are different from those of posttest [12].

The development of android-based mobile learning as the learning media can serve as one of the solutions to cope with the learning problems, both in terms of time limitations, media & broadcasting, and learning methods. The utilization of android-based-mobile learning media which uses offline system operation can run well and effectively so that the media give effect on the improvement of the learning results [12]. Technology can be used as one of sources and learning media which is effective and capable of changing a conventional learning into a modern [13].

The implication of using application based android (e-patient safety) in nursing is to provide learning that allows all nursing personnel to get information and knowledge development effectively and efficiently with the results of increasing the competence of nurses in the hospital.

IV. CONCLUSION

Based on the research results it can be concluded that overall disemination media applications very well used by nurses (86,6%). The statistical results show that there is a significant influence between the level of understanding of nurses before and after being given intervention using the android application (e-patient safety) about patient safety learning (p-value 0.000).

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REFERENCES

[1]. Joint Commission International, “Comprehensive Accreditation Manual for Hospitals : The Patient Safety Systems Chapter,” *Jt. Comm. Int.*, 2015.
[2]. J. C. Pham, C. Hoffman, I. Popescu, O. M. Ijagbemi, and K. A. Carson, “A tool for the concise analysis of patient safety incidents,” *Jt. Comm. J. Qual. Patient Saf.*, vol. 42, no. 1, pp. 26–33, 2016.
[3]. et. al Costa, “Evaluation procedures in health: Perspective of nursing care in patient safety,” *Appl. Nurs. Res. Res*, vol. 35, no. 71, p. 6, 2017.
[4]. J. Q. Swift, “Patient Safety and the Malpractice System,” *Oral Maxillofac. Surg. Clin. North Am.*, vol. 29, no. 2, pp. 223–227, 2017.
[5]. Januszwensky and Molenda., *Educational Technology*. US: Thailor & Francis Group, 2008.
[6]. Scientia Mobile, *“Mobile Overview Report January – March 2017,.”* 2017.
[7]. J. R. Lewis, *Psvchometric evaluation of a Dost-study Svstem usabilitv auest ionnaire: The PSSUQ (Tech. Report 54.535)*. Boca Raton, F: International Business Machines Corp, 1990.
[8]. J. R. Lewis, “An after-scenario questionnaire for usability studies: Psychometric evaluation over three trials,” *SlGCHl Bull.*, vol. 23, no. 79, 1991.
[9]. HOSPITAL ACCREDITATION COMMISSION, *SNARS 1st Edition*. Jakarta, 2017.
[10]. M. N. Arsyad and D. E. G. Lestari, “Efektifitas Penggunaan Media Mobile Learning berbasis Android Terhadap Hasil Belajar Mahasiswa IKIP Budi Utomo Malang,” *Agastya J. Sej. Dan Pembelajarannya*, vol. 10, no. 1, p. 89, 2020.
[11]. W. Kusmaryani, B. Musthafa, and P. Purnawarman, “The influence of mobile applications on students’ speaking skill and critical thinking in English language learning,” *J. Phys. Conf. Ser.*, vol. 1193, no. 1, 2019.
[12]. Musahrain, “Developing Android-Based Mobile Learning as a Media in Teaching English,” *Proceeding 2nd Int. Conf. Teach. Train. Educ. Sebel. Maret Univ.*, vol. 2, no. 1, pp. 307–313, 2016.
[13]. Anitah, *Technological Learning*. Surakarta: Yuma Libarary, 2009.