



## THE INFLUENCE OF WEB-BASED HOSPITAL NURSE CARING INFORMATION SYSTEM APPLICATIONS AS AN EFFORT TO INCREASE KNOWLEDGE AND CARING ATTITUDES OF NURSES

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### ABSTRACT

Caring is a dynamic approach, where nurses work to increase their care for clients. Nurses' knowledge and caring attitude are the things that underlie nurses in applying caring behaviour. Objective: to determine the effect of SI CAPERS application as an effort to increase nurses' knowledge and caring attitude in the ICU Room of RSI PKU Muhammadiyah Tegal. Method: Research study and the effect of application and quasi experiment with non equivalent control group design. The application was tested by questionnaire for usability and Aiken V test for material and media. Paired Sample T Test was used to analyse data on nurses' knowledge and caring attitude. The population of this study was all ICU/HCU nurses at RSI PKU Muhammadiyah Tegal. The sample taken was 34 people consisting of 17 ICU nurses as the intervention group and 17 nurses as the control group. Results: The results of the SI CAPERS application questionnaire are very feasible at 92.5% and 0.841 according to the objectives, material, methods, sources and learning activities with an easy, attractive and simple design. Data analysis resulted after the intervention there was an effect of the SI CAPERS application as an effort to increase knowledge and caring attitudes of nurses p - value <0.006. Conclusion: SI CAPRES application is able to improve the knowledge and caring attitude of nurses in the ICU Room of RSI PKU Muhammadiyah Tegal.

Keywords: attitude of nurses; caring; knowledge; SI CAPRES application

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## INTRODUCTION

A hospital is an integral part of a social and health organization with the function of providing complete (comprehensive) services, healing of disease (curative) and prevention of disease (preventive) to the community so that the highest level of welfare can be created (WHO, 2013). A hospital is a place where people undergo treatment and examinations in which there are many services and patients have the right to receive quality services in accordance with operational standards (Ministry of Health of the Republic of Indonesia, 2009). Health services in Indonesia provided by hospitals continue to develop and always provide rapid changes because the current era of globalization that we are facing has an important impact and influence, especially in the health sector and as health workers, especially nurses, are the main

key in successfully achieving health development goals. The most important thing is that patients continue to use hospital services and that patients feel satisfied and happy in receiving services (Purwoastuti & Walyani, 2014).

Caring behavior in its urgency in health services is influenced by the participation of nurses in providing nursing services to patients. Nursing is a form of professional service and is an integral part of health services that are based on nursing knowledge and tips (Hidayat, 2008). Quality nursing services require nurses to work professionally and in a standardized manner, with patient-focused and comprehensive services. Professional nurses are expected to be able to act humanely towards patients. Humanist behavior means that nurses treat patients as human beings who must be cared for, looked after and served wholeheartedly. by providing the best nursing services so that caring behavior can be realized (Nursalam, 2011). According to Watson, the theoretical basis for nursing practice is in 10 caring factors, each of which has a dynamic component and develops ten caring factors to help specific needs of patients with the aim of realizing complete functional integrity so that biophysical, psychosocial and interpersonal needs are met. Caring behavior is very necessary for someone to provide services, because the relationship between the health service provider and the patient is a factor that influences the patient's satisfaction and healing process (Watson, 2009).

The caring behavior approach with the main focus in nursing is the karative factors (the nature of the nurse's character which explains caring as manifested as the essence and core of nursing) which was developed from a "humanistic" perspective and combined with basic science, and is interpreted as responsibility between nurses and people. The other is the patient. Based on this idea, caring will enable harmonious interpersonal relationships between nurses and patients, can help and fulfill the patient's needs so as to provide satisfaction to the patient (Ilkafah & Harniah, 2017). In Indonesia, caring behavior is one of the assessments for health service users. Several survey results in several hospitals in Jakarta showed that 14% of clients were dissatisfied with the health services provided due to the behavior of nurses who were less caring (Ministry of Health of the Republic of Indonesia, 2015). This fact shows that caring behavior influences the level of patient satisfaction. (Abdurrouf & Kasim, 2016).

Several research results showed that the cause of nurses' lack of caring behavior was ICU nurses' work fatigue which could not be overcome, causing various fatal work problems (Hammad et al., 2018). Nurses spend more time in front of computers, monitors, or patient records than caring for patients or families (Yuliawati, 2012). The performance of ICU nurses is required to be maximal and work at the maximum level so that the level of fatigue of nurses in critical care rooms will be higher than nurses in other rooms (Sacco & Harvey, 2015). The majority of patients in the ICU are in the total care dependency level which requires extra supervision and treatment, amounting to 89% in research (Arif, 2018). Work stress found in the ICU is lack of support for staff, unfair compensation for services, imbalance in career levels, and division of tasks at work (Soep, 2012). Doctors and nurses in the ICU are known to experience high burnout due to the high stressors of caring for critical patients, which can reduce the quality of patient care (Guntupalli et al., 2014). High workload is one of the factors that influences nurses' caring, this will affect the quality of service. A heavy workload can influence a nurse to make decisions or behave in providing nursing care (Putri, 2018). Research conducted by (Supriatin, 2015) with a total of 43 nurse respondents showed poor caring behavior of 25 respondents (58.1%), this happened because the majority of nurses were actively involved and focused on medical phenomena such as diagnostic methods and treatment methods. In one Saudi Arabian hospital, 3.2% of nurses' caring behavior was lacking (Shalaby et al., 2018). In Indonesia, 24% of nurses' caring behavior shows less caring

behavior. At Serang General Hospital, caring behavior is 45% less (Rohmatulloh and Ani H., 2018).

The results of research (Wulan & Wiwin, 2019) at RAA Soewondo Pati Regional Hospital show that caring nurses in the ICU (Intensive Care Unit) are 75% caring enough, this is possible because there is the influence of nurses who always provide motivation to patients and there is supervision and briefing in every time they provide services to patients, while 15% said they were moderately caring and 10% said they were less caring, this was due to the very high psychological pressure on nurses because of the close relationship with the patient and the close proximity to death in the intensive care room (Usman, 2017). Caring behavior in the intensive care room is very necessary to understand that patients being treated in the intensive care room really need attention from nurses to support their recovery. Some of the caring behaviors that can be carried out in the ICU include nurses' caring behavior which is considered positive, such as paying attention to the patient's condition, paying attention when the patient expresses a problem, making the patient feel comfortable and safe, accompanying the patient, listening when the patient wants to complain (Fitriani et al. , 2022).

The cause of the low level of caring behavior is caused by several factors. According to Gibson (1987) in Faizin & Winarsih (2008) there are three factors that can influence nurses' caring behavior, namely individual factors consisting of knowledge and skills, educational background, and demographics. Psychological factors consisting of attitude, personality, learning and motivation. Organizational factors consisting of resources, training and development, rewards or rewards, decision making, risk taking and cooperation. Education is one of the individual factors that influences nurses in caring behavior. Education is very important for nurses to develop caring behavior. Apart from education, the next individual factor included is knowledge. Knowledge is what underlies nurses in applying caring behavior. The higher the nurse's knowledge of caring, the more the nurse hopes to know what kind of attitude can show herself to behave caringly towards clients. This assumption is based on the fact that nurses who have a good cognitive level of caring have a sufficient theoretical basis for themselves to practice caring. The results of research at RSU Dr. H Koesnadi Bondowoso showed that there was a relationship between nurses' cognitive level regarding caring and the application of caring practices (Setyo Prabowo et al., 2014).

Nurses' attitudes towards caring also influence nurses' caring behavior. This is based on nurses who respond positively to caring will support all activities related to caring and will find it easy to implement caring behavior, and vice versa. Another cause of the low caring behavior of nurses is the busyness of nurses or workload so that nurses miss many opportunities to apply caring in their work, such as being busy with medical equipment for treating patients, and actions such as giving injections, installing IVs, installing NGTs, changing wound dressings, etc. or diagnostic examinations on patients that are not actually the essence of nursing practice. Nurses consider caring only as an expression or something that will be done if they have the time (Williams et al., 2011). By using the SI CAPERS application, it is possible to increase nurses' caring behavior, including causal factors such as workload and stress. Therefore, in this study, researchers will develop a web-based SI CAPERS application which aims to increase knowledge and caring attitudes towards ICU nurses so that patients get a level of patient satisfaction in their care and in accordance with the results of the national patient satisfaction indicator, namely 76.60% (Ministry of Health of the Republic of Indonesia , 2022).

Researchers have conducted a preliminary study on nurses in the ICU and Upper Multazam rooms at RSI PKU Muhammadiyah Tegal on November 28 2022 with 6 ICU nurses and 6 Upper Multazam nurses. In this initial survey, researchers conducted in-depth interviews and observations with 6 ICU nurses with questions related to caring behavior. Based on the results of a preliminary study of nurses, it was still found that nurses' behavior did not heed caring behavior towards patients with the results being 66.6% who still did not show caring behavior from nurses (Ministry of Health RI, 2010). Information obtained during a preliminary study of nurses who were suspected of lacking caring behavior, the causes include nurses still focusing more on healing the patient's illness, while the patient's psychological and spiritual needs are still not given full attention and there is a lack of understanding of caring behavior because they actually know about caring behavior but not yet able to implement all of it. And the information obtained from the 6 Multazam Atas nurses was that the nurses had made caring efforts but were not optimal because the number of patients was large, an average of 40 patients. The urgency is for nurses' caring to be good, so it is more appropriate to do it in the ICU room because the level of patient needs is higher with total care and 24-hour ICU nurse assistance next to the patient, whereas in the room the level of patient needs is divided into minimal and partial care, and in the room the patient's family is involved. in meeting patient needs (assisting the patient's family). Efforts that have been made by the head of the room to improve the caring behavior of ICU nurses include guidance and implementing caring behavior for patients, however, these efforts are not sufficient because nurses are still found to ignore caring behavior when providing services to patients.

Therefore, other efforts are needed to increase nurses' caring behavior through increasing knowledge and reminding them regarding caring attitudes (Ministry of Health, 2007). By creating a web-based SI CAPERS application, we can overcome the weaknesses that occur in nurses who have not demonstrated good nursing caring behavior so that the SI CAPERS application can change nurses' caring behavior from poor to good. Based on research results from (Ningtyas, 2019) that there is an application that is almost the same, namely the Nursing Android Caring Module (NACM) application, an application in the form of an Android mobile which is very efficient in its use and does not spend a lot of time in this application, it is hoped that nurses can be helped in carrying out nursing caring behavior services to patients. In the NACM application there are only menus or features in the form of modules about caring, whereas in the SI CAPERS application there are videos of nurses' caring behavior and videos of Nursing SPOs, totaling 11 SPOs. The aim of this study is to investigate the influence of the web-based SI CAPERS application on increasing the knowledge and caring attitudes of nurses in the ICU room at RSI PKU Muhammadiyah Tegal.

## **METHOD**

This research uses two research designs, namely Research and Development (R&D) and a quantitative approach (Quasi Experiment). This research focuses on developing the SI CAPERS application as a learning medium for ICU nurses in improving caring behavior. The variable measured was the effectiveness of the SI CAPERS application in increasing the caring behavior of ICU nurses. The research was conducted in the ICU Room at RSI PKU Muhammadiyah Tegal. The population is ICU nurses, with a sample of 10 nurses for the initial trial and 17 nurses for the field trial. The main material is the developed SI CAPERS application, while the main tools include hardware (laptop, smartphone) and software (Visual Studio Code, XAMPP, MySQL, web browser). Data was collected through interviews, observations, observation sheets, and response questionnaires to the media developed. Qualitative data is analyzed by describing the application development process and evaluation by experts, while quantitative data is analyzed using descriptive statistics. R&D uses the Borg

and Gall model, including research and initial information gathering stages, planning, initial product development, initial trials, product revisions, field trials, product revisions, field trials, final product revisions, dissemination and implementation, application development using ADDIE model, with stages of analysis, design, development, implementation and evaluation, quasi-experiment was carried out using Non Equivalent Control Group Design, where one group was given intervention using the SI CAPERS application and the other group served as a control. A complete explanation of the procedures and steps of this research is explained in detail according to the stages carried out in developing the SI CAPERS application and carrying out a quasi-experiment to measure the effectiveness of the application in improving the caring behavior of ICU nurses.

## **RESULTS**

### **Research Stage I**

This development study resulted in a product, namely the SI CAPERS application which includes 9 stages: potential and problems, gathering information, product design, design validation, design improvement, product testing, product revision, usage testing, and product revision. The first stage is potential and problems. The potential of this development study is the development of a web-based SI CAPERS application. The potential of developing this product is useful for minimizing problems in the ICU. Therefore, further research is required to resolve the problems. The next stage was collecting information. At this stage, the researcher searched for and collected information that supports the creation of learning media, such as information from syllabuses, books, journals, and other scientific works. Then SI CAPERS application that has been revised was tested by users on a small scale, including 10 nurses from the ICU. Based on the results of the user assessment, it was found that the total score from users was an average of 88.5%, which was included in the "very good" category. The reliability test carried out by material and media experts using ICC showed scores of 0.761 and 0.841, so it can be concluded that this media is included in the very good category. After testing, results were obtained, then the results were evaluated.

### **Research Stage II**

#### **Analysis of Research Data and Hypothesis Testing**

##### **1. Characteristics of Respondents**

The characteristics of respondents examined in this study included gender, education, and age. The results of the analysis showed that the majority gender in the intervention group was women of 12 respondents (70.6%), and the majority gender in the control group was women of 13 respondents (76.5%). The characteristics of education in the table show that the majority of education in the intervention group was Nursing Diplomas of 12 respondents (70.6%), and the majority of education in the control group was Nursing Diplomas of 11 respondents (64.7%). The table above also shows that the majority of respondents in the intervention group were around 25-50 years old of 14 respondents (82.4%), and the majority of respondents in the control group were around 25-50 years old of 15 respondents (88.2%).

##### **2. Hypothesis testing**

###### **a. Paired Sample T Test**

- 1) Differences in score of nurses' caring knowledge between the intervention group and the control group.**

The results of differences in nurses' caring knowledge between the pre-test and post-test in the intervention group showed that there was a significant difference in the mean of nurses' caring knowledge with a sig of  $0.006 < 0.05$ , which means that  $H_0$  is rejected, and  $H_a$  is accepted. Thus, the application of SI CAPERS has

an influence on improving nurses' caring knowledge in the ICU Room at RSI PKU Muhammadiyah Tegal.

The results of differences in nurses' caring knowledge between the pre-test and post-test in the control group showed that there was no significant difference in the mean of nurses' caring knowledge with a sig value of  $0.858 > 0.05$ .

- 2) Differences in the score of nurses' caring attitude between the intervention group and the control group.

The results of differences in nurses' caring attitudes between the pre-test and post-test in the intervention group showed that there was a significant difference in the mean of nurses' caring attitudes with a sig value of  $0.009 < 0.05$ , which means that  $H_0$  is rejected, and  $H_a$  is accepted. Thus, the SI CAPERS application has an influence on improving nurses' caring attitude in the ICU Room at RSI PKU Muhammadiyah Tegal.

The results of differences in nurses' caring attitude between pre-test and post-test in the control group showed that there was no significant difference, with a sig value of  $0.919 > 0.05$ .

b. Independent Sample T-test

Based on the homogeneity test, the levene value was obtained with a sig value of  $0.724 > 0.05$ , which indicates that the data were homogeneous.

From the results of the independent sample t-test showed that the mean value for the pre-test in the intervention group was 12.0 with a standard deviation of 4.35. Meanwhile, the mean value for the pre-test in the control group was 15.0, with a standard deviation of 2.29. The sig value of 0.91 means that  $H_0$  is accepted and  $H_a$  is rejected, in which there was no influence. Furthermore, the results of the mean value for the post-test in the intervention group was 15.76 with a standard deviation of 0.66. Meanwhile, the mean value for the post-test in the control group was 14.88, with a standard deviation of 0.99. The sig value of 0.00 means that  $H_0$  is rejected and  $H_a$  is accepted based on the output, which can be concluded that there are significant differences or comparison results between the control group and the intervention group.

## DISCUSSION

### Research Stage I

According to the validity test of the materials and media, as well as usability testing, it suggested that the product developed has been suitable for use in the learning process. This feasibility test was based on the feasibility test by material experts, which obtained a score of 0.783 and stated in the high validity category. This score still can be accepted, according to Widodo et al. (2022), whose study used Aiken's score of more than 0.7. The high feasibility score of the materials in the SI CAPERS application is because the materials have been in accordance with the concept of caring theory. This result shows that material presentation, exercise, and the use of language in the media developed are in good category and accordance with the needs of nurses. Moreover, the feasibility test of the media expert obtained a score of 92.5%. Based on the feasibility interpretation table according to Chania et al. (2020), a score of 92.5% is included in a "very good" category, which means it is very feasible/does not require revision. This result shows that the SI CAPERS application has an attractive display and is easy for nurses to use. Overall, the feasibility of learning media in the SI CAPERS application is reviewed from the aspect of material feasibility, which is included in the very feasible category, while if reviewed from the aspect of media feasibility, it is included in the

feasible category. According to the results of media validation above, the SI CAPERS application, as a learning media, is very feasible, so it can improve nurses' knowledge and caring attitude.

The reliability test carried out by material experts using ICC showed a score of 0.761, which can be concluded that this media is included in a very good category, while the reliability test carried out by media experts using ICC showed a score of 0.842, which can be concluded that this media is included in a very good category. This is in line with the study by Zaki (2017), where the ICC score was 0.83 or close to one, which means that the reliability and validity of the two instruments are almost perfect. The feasibility trial on a small scale obtained a total score with a mean of 88.5%. Based on the feasibility interpretation table according to Chania et al. (2020), a score of 88.5% is included in a "very good" category, which means it is very feasible/does not require revision. Therefore, it can be concluded that the web-based SI CAPERS application has been developed and generated the final product of the SI CAPERS application. Moreover, according to the total calculation, this application is very feasible to use in assisting nurses in an attempt to improve their knowledge and caring attitudes.

## **Research Stage II**

### a) The characteristics of respondents

The results of the study conducted by Wahyudi et al. (2017) showed no significant correlation between gender and caring behavior. All nurses, both males and females, have the same opportunity to behave caringly to patients. Age becomes one of the internal factors influencing caring behavior for nurses. The younger the nurses' age, the lower the level of caring behavior. Research conducted by Tri Anggoro & Aeni (2018) stated that gender has a great influence on the performance of caring behavior, where the older the nurses age, the more responsible and experienced they will be in accepting jobs. Caring, in the context of service, will be in line with the educational level of a nurse, so it can be stated that the quality of caring in a nurse will be in line with the educational level of a nurse (Jean Watson et al., 2008 in the Kristiawan & Purwantara, 2020).

### b) The Influence of Hospital Caring Information System Application (SICAPERS) as an Attempt to Improve Knowledge of Caring in Nurses.

The results of the paired sample t-test obtained the caring knowledge score of a nurse in the intervention group of sig. 0.006. Moreover, there was also an increase in mean score, from 12.00 on the pre-test to 15.76 on the post-test, which means there was a significant difference in results in the intervention group. This shows that SI CAPERS application has an influence on nurses' caring knowledge. Meanwhile, control group did not show a significant results. This is in line with the study by Setyo and Ardiana (2014), which showed that most nurses have a good cognitive level of caring behavior.

### c) The Influence of Hospital Caring Information System Application (SICAPERS) as an Attempt to Increase Caring Attitude in Nurses.

The results of the paired sample t-test obtained results of caring attitude in nurses for pre-test and post-test with sig. 0.009 in the intervention group, which means that there was a significant difference in results in the intervention group. This shows that the SI CAPERS application has an influence on the caring attitude of nurses. Meanwhile, the control group did not show significant results. The results of this study are in line with the study conducted at Inpatient Room Class II of Barokah and Inayah Wards in PKU Muhammadiyah Gombong Hospital, which showed that most respondents have a positive attitude towards caring behavior (Ramadhan, 2017).

## **CONCLUSION**

The conclusions in this research are as follows: The resulting product is a web-based application, namely SI CAPERS (Information System Caring Hospital Nurse) with the address <http://www.sicapers.com>. The distribution of the characteristics of the research respondents is that the majority of gender is female, the majority of education is a D3 Nursing graduate and the majority of age is 25-50 years. There was a significant difference in the average nurse knowledge score in the intervention group and there was no significant difference in the control group. There is a significant difference in the average attitude scores caring nurses in the intervention group and there was no significant difference in the control group. There is a comparison of knowledge and attitude scores caring nurses were significant in the intervention group and control group. There are differences in knowledge and attitude scores caring nurses from the control group and intervention group after using the SI CAPERS application, which means  $H_0$  is rejected and  $H_a$  is accepted, which means there is an influence of the information system application caring hospital nurses (SICAPERS) as an effort to increase knowledge and attitude caring nurse in the ICU Room at RSI PKU Muhammadiyah Tegal.

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