

# Socialization of Information Technology Utilization and Knowledge of Information System Effectiveness at Hospital Nurses in Medan, North Sumatra

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**Abstract**—Background of this research is the globalization and development of science, especially in the field of information and communication technology and communication that has influenced and has implications for changes and renewal of people's lives, including in the field of nursing. So that the role of information and communication in this aspect of life is very important, even the futurists, for the most part, have an agreement that one of the most important strengths as the source of future power is information. Purpose: identify the use of information technology in nursing to determine the effectiveness of the use of information systems in nursing, identify nurses' knowledge about the effectiveness of nursing information systems, identify nurses' knowledge seen from the socialization of the effectiveness of nursing information systems. Method: Quantitative Research Type with a survey approach conducted on 220 nurses. Significant validity test is  $<0.05$ , Cronbach Alpha reliability test  $> 0.60$ . The data is then tested in a classic assumption test consisting of multicollinearity tests, autocorrelation tests, heteroscedasticity tests, normality tests, multiple linear regression, t-tests, F tests, coefficient of determination tests. Results: the use of information technology affects the effectiveness of nursing information systems. Nurse knowledge does not affect the effectiveness of nursing information systems. Nurse knowledge seen from socialization does not affect the effectiveness of nursing information systems. The use of information technology and nurse knowledge influences the effectiveness of nursing information systems. The results of the coefficient of determination that affect the use of information technology, knowledge of nurses, socialization as a control variable on the effectiveness of nursing information systems. Suggestion: Hospital managers must pay attention to the quality of nursing human resources, through training, certification, recognition of competencies, supervision, selection, and guidance aimed at improving safe, comfortable and satisfying services for patients, families, communities.

**Keywords**—Information systems; knowledge; nursing; socialization

## I. BACKGROUND

Information systems are computer systems that collect, store, process, retrieve, show, and communicate information needed in practice, education, administration and. Many benefits are obtained in the use of information systems. This benefit not only reduces errors and increases speed and accuracy in care, but also reduces health costs by coordinating and improving service quality. The rapid progress and

development of information needs, especially technology in the globalization era, has had a significant influence on the application of information systems in the health sector. Health Information System is a set of arrangements that includes data, information, indicators, procedures, tools, technology, and human resources that are interrelated and managed in an integrated manner that provides information support for decision making processes, health program planning, implementation of monitoring and evaluation at every level of health administration Health information systems are a very important part of improving hospital efficiency and supporting competitiveness by providing health service information for management [1].

Nursing services in a hospital environment is one of the services in the health sector that has an important role in determining the success of services provided in hospitals. With the highest number of nurses in the hospital environment, the existence of nursing services must be managed properly to produce the quality of nursing services provided. Improving the quality of nursing information systems is one solution to improve the quality of nursing services. It is undeniable that so far the development of nursing information systems in this country has not been going well. Nursing information systems are a combination of computer science, information science and nursing science that are organized to facilitate management and the process of gathering information and knowledge used to support the implementation of nursing care. Meanwhile, according to America Nursing Association [2] nursing information systems relating to legality to obtain and use data, information and knowledge about documentation, communication standards, support the decision making process, develop and disseminate new knowledge, improve quality, effectiveness and efficiency of care and empower patients to choose the desired health care. The reliability of an information system in an organization lies in the interrelationship between existing components so that it can be produced and flowed into useful, accurate, reliable, detailed, fast, relevant information for an organization. This information system is expected to improve service quality in achieving service quality standards. Clinical indicators of service quality include: measurement of decreased patient rates, pressure sores, nosocomial pneumonia, nosocomial infections, and incidences of medical errors. This computer-based information system will identify

various types of patient needs, ranging from care documentation, medication documentation, to financial calculations that must be paid by patients for the care they have received [3]. Many people complain about the health services they receive from nurses.

For this reason, nurse performance needs to be improved so that the quality of care services can be provided properly. One measure of whether quality health services are provided to the community is the level of satisfaction for the people who receive the services themselves. One of the benefits of implementing a nursing information system in a hospital setting is to help nurses document nursing care. Nursing care in meeting the basic needs of patients is provided by nurses in various health care settings using the nursing process. Nurses use nursing information systems with the aim to clearly assess patients, prepare nursing plans, document nursing care, and to control the quality of nursing care. Nurses can have an integrated view of data (for example integration between nurses and doctors in patient care plans) [4]. By utilizing nursing information systems nurses can save time to do the recording compared to when done manually recording. In addition, data recorded using a nursing information system will be more secure. The risk of recorded data will be lost is very small. In contrast to paper-based records, where the possibility of data loss is very likely to occur. In addition, the existence of a nursing information system will also increase the effectiveness and efficiency of nursing staff work. Implementation of nursing information systems in hospitals, which combines computer science, information science, and nursing science that is designed to facilitate management and the process of collecting data, information, and knowledge to support the implementation of nursing care [5]. Nursing information systems are being developed on an ongoing basis in the future nursing knowledge will depend on the ability of information systems to facilitate the results of diagnosis, management, research, education, information exchange, and collaboration / collaboration, that the integration of nursing, computer science can be used to identify, collect, process, organize data and information to support nursing practice, administration, education, research, and development of nursing science [5]. The need for a management information system supports nurses in assisting decision making. Advances in technology in hospitals enable nurses to use management information systems to support the delivery of nursing care, so that better quality nursing care is achieved [6].

According to [7] the research focused on exploring Computerized Provider Order Entry (CPOE) and its impact on the work done by nurses. The result is that CPOE is a technology designed to replace paper entry, communication and coordination with automated methods, one of which is in collaborative collaboration to prescribe drugs in acute care. CPOE has been proven to improve communication efficiency and reduce drug transcription errors and reduce patient care time, so the patient's morbidity and mortality are reduced. Actually to implement a nursing information system in a hospital environment is not too difficult to implement, only a commitment to implement it is needed. In times of technology such as now, maybe almost all nurses can operate a computer as a device in the application of nursing information systems.

This is a very large capital that strongly supports the implementation of nursing information systems.

Now the only problem is how we are committed, from top management to the lowest management to fight for the implementation of nursing information systems in each nursing service unit. The reason for the lack of availability of funds to develop nursing information systems is a classic reason that should no longer exist. Especially seeing the importance of nursing information systems to improve the quality of nursing services in particular and health services in general. Based on the above problem, this research was conducted with the aim of 1) identifying the use of nursing information technology on the effectiveness of nursing information systems, 2) identifying nurses' knowledge about the effectiveness of nursing information systems, 3) identifying nurses' knowledge as seen from the socialization of the effectiveness of nursing information systems. The use of information technology is the use of technology in the Nursing Nursing Service System Nursing is the understanding of nurses in the operation of Nursing Information System software to provide accurate and timely results in care reports so that they have an increasing impact on the Hospital. Socialization is the dissemination of information about Nursing Information Systems conducted by hospitals to nurses in operating information systems. The effectiveness of the Nursing Information System is the operation of the Nursing information system in the hospital with ease of use, accurate results, and timeliness.

## II. METHOD

This research is quantitative, use a survey research, with a sample of 220 nurses from several hospitals in Medan. The instrument used was tested for validity and reliability, the results of the analysis showed all items were valid because each indicator showed a significant result that was  $<0.05$ . The reliability test results showed that all research instruments were reliable because each instrument produced a Cronbach Alpha  $>0.60$ . The data is then tested in a classic assumption test consisting of multicollinearity tests, autocorrelation tests, heteroscedasticity tests, normality tests, multiple linear regression, t tests, F tests, coefficient of determination tests.

The hypothesis in this study was formulated as follows:

H1: The use of information technology has a significant positive effect on the effectiveness of nursing information systems.

H2: Nurse knowledge has no significant effect on the effectiveness of nursing information systems

H3: Nurse knowledge seen from socialization has no significant effect on the effectiveness of nursing information systems.

## III. RESULT AND DISCUSSION

### A. Descriptive Analysis

Descriptive analysis shown in Table I, results about the use of information technology on average showed 4.39 where the average respondent answered agree, the nurse's knowledge showed an average value of 4.55 where the respondent

responded most agreed, socialization showed an average value of 1.9 where the average respondent disagrees. participate in the socialization of Nursing Information Systems. The effectiveness of the nursing information system shows an average value of 4.18 where the nurse answers the average in the agreement.

**B. The Classic Assumption Test**

In Table II, test results show that there is no classic consideration problem. In the normality test shows the value of sig. equal to 0.715 > 0.05 which means that the data are declared normally distributed. Multicollinearity values indicate if tolerance values >0.1 and VIF <10, which means there are no multicollinearity problems. The autocorrelation test results showed a probability value of 0.818 > 0.05. Heteroscedasticity test results >0.05 which shows no heteroscedasticity problems.

**C. Multiple Linear Regression Analysis**

This analysis is used to examine the effect of utilizing information technology, nurse knowledge, and socialization. Based on data processing using the SPSS program, the following results are obtained as shown in Table III.

TABLE I. DESCRIPTIVE ANALYSIS

Variabel	Min	Max	Mean	Std. Deviation
Utilization of Information Technology	4	5	4,39	0,32
Knowledge of Nurses	1	5	5	0,49
Socialization	0	12	1,9	2,82
Nursing Information Systems	3	5	4,18	0,37

TABLE II. CLASSICAL ASSUMPTION TEST

Variable	Multicollinearity		Heteroskedasticity	Normality
	Tolerance	VIF		
Utilization of Information Technology	0,569	1,757	0,757	0,715
Knowledge of Nurses	0,491	2,035	0,373	
Socialization	0,822	1,217	0,527	

TABLE III. MULTIPLE LINEAR REGRESSION TEST

Model	$\beta$	t	Sig
a costant	11,852	0,682	0,505
Utilization of Information Technology,	1,319	0,504	0,19
Knowledge of Nurses,	0,038	0,64	0,950
Socialization	0,134	0,282	0,782
Adjusted R <sup>2</sup>	0,324		
F count	4,042		
Sig. F	0,026		

Based on these results it can be estimated that multiple linear regression is as follows:  $Y = 11,852 + 1,319 X1 + 0.038 X2 + 0.134X3$

Interpretations of the regression equation are:

a: 11,852 means that the use of information technology (X1), knowledge of nurses (X2) and socialization (X3), is equal to zero, so the utilization of information systems (Y) is equal to 11,852.

b1: 1,319 which means that the influence of nurse knowledge (X2) and socialization (X3) variables on the information system capability (Y) is positive, which supports the ease of information technology increased by one (unit), can improve nursing information systems (Y) by 1,319 with nurses' knowledge assumptions (X2), and socialization (X3) are considered permanent.

b2: 0.038 means that the influence of the use of information technology (X1), socialization (X3) on the ability of a positive accounting information system (Y), which supports nurses' knowledge to increase one (unit), can improve nursing information systems (Y) by 0.038 with the assumption information technology (X1) and socialization (X3) are considered permanent.

b3: 0.134 means that the use of information technology (X1), nurse knowledge (X2) for accounting information systems (Y) is positive, which supports the socialization of an increase in one (unit), so as to improve nursing information systems (Y) by 0.134 assuming benefits information technology (X1) and nurse knowledge (X2) are considered permanent.

**D. Coefficient of Determination (Adjusted R Square)**

Based on the SPSS calculation results, the adjusted R square value is 0.324. This shows 32.40 percent, the variable utilization of information technology, knowledge of nurses, and socialization of the effectiveness of nursing information systems. While the rest  $(100\% - 32.4\%) = 67.6\%$  is explained by other variables not included in this regression model or not examined in this study.

**E. F Test**

Based on the calculation of multiple linear regression shows that Sig. F = 0.026 <  $\alpha$  0.05. This reflects if the model used in this study is suitable. The use of information technology, nurse knowledge and socialization simultaneously has a significant influence on the effectiveness of nursing information systems.

**F. Utilization of Information Technology about the Effectiveness of Nursing Information Systems**

The results of the probability value of 0.019 < 0.05 then H1 is rejected as a positive information technology that supports the use of nursing information systems. The results of this study are supported by research conducted by [8] in which the results obtained are related to positive technology for the use of information systems. Thus, the higher the level of information technology usage, the higher the level of nursing information system requirements. Therefore, the results of this study support the results of research conducted by [8] and [9].

Utilization of technology in general to process data, process, store, obtain, display, and send in various forms and ways used to produce benefits that can benefit the user. The information obtained can assist nurses in solving problems, solving problems, and evaluating them, making the information obtained must be of high quality. Quality information must be accurate, relevant, timely. Accurate means error free, not biased because it denies that biased information can mislead the recipient or user of that information [10]. Utilization of technology produces a number of technologies that are considered temporary in the sophistication of information seen from the nature of the application portfolio. The presence of technology is a source of strength that makes a company have a competitive advantage, and is identified as a factor that contributes to the company's success. Therefore, information technology has a high influence on the company's success in managing the company. In order for more sophisticated information technology to be applied, the effectiveness of the information system produced will be higher and the influence of information users [11].

#### G. Nurse Knowledge about the Effectiveness of Nursing Information Systems

The results of the probability value  $0.950 > 0.05$  then H2 is accepted so that the nurse's knowledge has no significant positive effect. The results of this study are not supported in research [8] and [12] because the results of this study have a significant effect and reading employee knowledge influences the effectiveness of the information system. Nurses in their knowledge are still weak and do not understand nursing information systems techniques so that the results of the information are still not timely and inaccurate so that the goals for the hospital have not been reached to the fullest. Can be seen if the higher the level of knowledge of nurses, the higher the level of effectiveness of nursing information systems.

#### H. Nurses' Knowledge can be Seen from the Socialization of the Effectiveness of Nursing Information Systems

The probability value of  $0.782 > 0.05$  then H3 is accepted so that the nurse's knowledge does not have a significant positive effect. The results of this study are not appropriate [14] a positive relationship between user training, user attitude and success. Nurse knowledge seen from socialization does not affect the effectiveness of nursing information systems because nurses to socialize about nursing information systems are still many who do not follow the socialization so that the nursing information system is generated from nursing information to various users both internal and external parties. still not enough. According to [13] that socialization is usually done when workers lack expertise or when an organization changes the system and needs to learn about new skills. Nurses, when participating in nursing information system socialization, will produce effective nursing information systems for hospitals that can provide added value to users in various nursing information for planning, control and decision making activities, which in turn has an impact on improving hospital performance by whole [15].

## IV. CONCLUSION

The results of the partial hypothesis that: the use of information technology has an effect on the effectiveness of nursing information systems, in this study the results have a significant effect that is reading the use of information technology has an effect on the effectiveness of nursing information systems. Nurse knowledge influences the effectiveness of nursing information systems, in this study the results did not have a significant effect so that the knowledge of nurses reading did not affect the effectiveness of nursing information systems. Nurse knowledge seen from the effect of socialization on the effectiveness of information systems, in this study did not have a significant effect so that the knowledge of nurses reading from socialization does not affect the effectiveness of nursing information systems. Simultaneous hypothesis that: the use of information technology and knowledge of nurses affect the effectiveness of nursing information systems, in this study the results have a significant effect that is reading the use of information technology and knowledge of nurses affect the effectiveness of nursing information systems. The results of the coefficient of determination that affect the use of information technology, knowledge of nurses, socialization as a control variable on the effectiveness of nursing information systems. Suggestion: Hospital managers must pay attention to the quality of nursing human resources, through: Ongoing training, certification, competency recognition, supervision, selection, and guidance aimed at improving safe, comfortable and satisfying services for patients, families, communities.

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