



## ANALYSIS THE IMPLEMENTATION DIGITAL-BASED NURSING INFORMATION SYSTEM WITH NURSES' JOB SATISFACTION AND PATIENTS' SATISFACTION

Nuryati<sup>1,2\*</sup>, Windu Santoso<sup>1</sup>, Faisal Ibnu<sup>1</sup>, Lilik Ma'rifatul Azizah<sup>1</sup>, Asroful Hulam Zamroni<sup>2</sup>

<sup>1</sup>Departement of Nursing, Universitas Bina Sehat PPNI Mojokerto, Jl. Raya Jabon, Gayaman, Mojoanyar, Mojokerto, East Java 61363, Indonesia

<sup>2</sup>RSUD Dr. Soetomo Surabaya, Jl. Prof. DR. Moestopo No.6-8, Airlangga, Kec. Gubeng, Surabaya, East Java 60286, Indonesia

\*[nunungaries@gmail.com](mailto:nunungaries@gmail.com)

### ABSTRACT

The implementation of digital-based information systems in nursing care documentation has been widely implemented in hospitals. However, nurses are still dissatisfied because they feel burdened by the digital system and this impacts patient satisfaction in receiving nursing care. Therefore, analysis is needed regarding the implementation of a digital-based nursing information system with nurse job satisfaction and patient satisfaction in hospitals. This study used a cross-section comparative design with a sample of 222 nurses and 222 patients. The sample was selected using a simple random sampling technique. Data collection using a questionnaire includes the independent variable in the form of the implementation of a nursing information system and the dependent variable in the form of nurse job satisfaction and patient satisfaction. Data were analyzed using the independent t-test with a p-value  $\leq 0.05$ . Research results from the independent t-test statistical test. The p-value is  $0.000 < 0.05$ , so according to the basis of decision-making in the test it can be concluded that  $H_0$  is rejected, which means there is a difference in average between nurse job satisfaction and patient satisfaction in the implementation of a digital-based nursing management information system in nursing services in the Inpatient Room RSUD Dr. Soetomo Surabaya. Implementation of a digital nursing information system provides nurses with effectiveness and efficiency in carrying out their duties. This makes the workload of nurses lighter increases the productivity of the quality of nursing received by patients and has an impact on patient satisfaction. Nursing management is expected to improve the implementation of supervision of nursing care documentation by looking at the completeness and suitability of SOPs in the nursing information system (SIK). In addition, nursing management needs to develop a nursing information system (SIK) model in collaboration with the hospital information technology team so that nurses are effective and efficient in implementing nursing care documentation.

Keywords: hospital; nurse job satisfaction; nursing information system; patient satisfaction

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## INTRODUCTION

The development of information technology has an impact on health services in hospitals (Sopiah & KS, 2023). The implementation of digital-based information systems in nursing care documentation has been widely implemented in hospitals (Wiwin Rusdiyanti et al., 2022). A nursing information system with a computer makes it easier for nurses to carry out their work (Mulyono & Sugiyanto, 2021). However, there are still nurses who are dissatisfied because they feel burdened by the existence of a nursing information system in digital form (Febrianita & Yunus, 2017). This has an impact on the quality of nursing services which

influences patient satisfaction in receiving nursing care (W. Lestari et al., 2021). Therefore, an analysis is needed regarding the relationship between the implementation of a digital-based nursing information system and nurse job satisfaction and patient satisfaction with nursing services in hospitals.

In Europe, it is reported that using EHR documentation the time required for documentation has been reduced substantially from an average of 31 minutes to 27 minutes (1.7 minutes to 1.5 minutes per patient) resulting in a savings of 4 minutes per shift (Agarta & Febriani, 2019). In the United States, it has been shown that 71% of nurses have been able to complete nursing documentation using information technology and 71.98% of nurses agree and understand the use of electronic-based documentation (Chand & Sarin, 2019). The results of previous research explain that the implementation of information systems for documenting nursing care is implemented optimally (68%) and less than optimally (32%) by nurses (Sege et al., 2022). This proves that the implementation of information systems in nursing care in Most hospitals is running well because it has become an issue of every nurse's hope for the transformation of nursing care documentation from initially paper-based to digital.

The implementation of digital-based nursing care documentation information systems is currently developing in the world of nursing services, its implementation has had a positive impact on nurses' enthusiasm (Ferdousi et al., 2021). The implementation of a digital-based nursing care documentation information system, apart from being addressed by every nurse, will of course result in satisfaction for nurses as users. User satisfaction is an emotional response to the evaluation of the consumption experience of a product or service which can better describe various product information in a more professional and human touch (Kotler & Keller, 2009). According to (Tjiptono & Chandra, 2016), the higher the user satisfaction from the consumption experience of a product or service, it indicates that the product or service is better and worthy of its use.

The use of information systems in the Healthcare 4.0 industrial era allows for more decisive efforts to improve nurse performance in providing high-quality nursing care at low costs (Tortorella et al., 2022). With the presence of various applications to support nursing care services, nurses must be able to adapt to technological developments in the 4.0 era. Apart from playing an important role for health service providers, especially in providing nursing care, documentation of nursing care is written evidence that shows the authority and competence of nurses (De Groot et al., 2022). In the scientific literature and nursing practice, the level of depth in which nurses' reports are described varies and is organized according to standards offered to provide consistent and integrated reporting (Shafiee et al., 2022).

Utilization of technology will help nurses embrace technological advances where nurses can plan, implement, evaluate, and collect data to support evidence-based practices in improving patient safety and quality of care (Cassona, 2018). It has been proven that technological advances play an important role in helping improve the quality of health and nursing services. Quality nursing services will provide nurses with satisfaction in providing nursing care to patients (Sutoto & Utarini, 2019). Improving the quality of health and nursing services also directly impacts patient satisfaction while undergoing treatment in a hospital. Patient satisfaction in the health service industry is a response to the patient's assessment of the services they receive. The patient's response to the services received greatly determines the continuity of organizations operating in the service sector such as hospital institutions. Overall, the majority of patients (85.0%) expressed satisfaction with nursing services (Noras & Sartika, 2012). Patient satisfaction is obtained from expectations regarding the quality of

service received by the patient. The patient's expectations consist of several aspects including ease of access, obtaining competent and skilled care, the attitude of nurses who respect patients, are attentive, and professional, and the patient's condition becomes better after receiving treatment (Joiner, 2007). Patient satisfaction cannot be separated from the performance provided by nurses in providing nursing care services. Heskett in Tjiptono (2016) stated that nurse satisfaction is obtained from job and workplace design that facilitates the quality of internal services. Satisfied nurses have the opportunity to be loyal and increase work productivity. Increased productivity followed by sincerity in helping patients will produce external service value. The impacts that occur if the patient is dissatisfied include the patient not reusing the health services provided. Patients will become competitors' customers, which will result in reduced service and hospital profits will decrease.

Based on several kinds of literature regarding the importance of the role of information technology-based nursing care documentation, it has many advantages if applied in hospitals, including; saving paper purchasing costs, working more quickly, effectively, and efficiently, having higher accuracy data, and creating work productivity. This study aims to examine the relationship between the implementation of a digital-based nursing information system with nurse job satisfaction and patient satisfaction with nursing services at RSUD Dr. Soetomo Hospital, Surabaya.

## **METHOD**

The design of this research is comparative analysis techniques with a cross sectional approach, namely a research design to find out whether there is a difference in averages in two unpaired samples (Nursalam, 2020b). The sample in the study was 222 nurses and 222 inpatients obtained from a simple random sampling technique. The research data were collected through a questionnaire from the dependent variable of the implementation of the nursing system with an observation sheet developed by the researcher based on the nursing care documentation items with a valid value of 0.590-0.926 (Zamroni et al., 2021), and nurse satisfaction MSQ (Minnesota Satisfaction Questionnaire) with a reliable value of 0.966 (Izzata et al., 2021), and the dependent variable of nurse job satisfaction with a valid value of 0.534-0.865 and a reliable value of 0.951, as well as patient satisfaction with the parasuraman theory questionnaire with a valid value of 0.530-0.961 and a reliable value of 0.514 (Nursalam, 2020b). Research data was processed using the description test and using the Independent t-test with a p value  $\leq 0.05$ . This research has received approval and is appropriate from the Health Research Ethics Committee of RSUD Dr. Soetomo Surabaya with No: 1454/LOE/301.4.2/IX/2023.

## **RESULTS**

Based on 1, it shows that the gender of the respondents was female, 157 nurses (70.7%) and 132 patients (59.5%). The age of most nurse respondents was 30-39 years (33.3%) and patients were 17-50 years (70.7%). The majority of nurses' education is Bachelor's + Nursing (49.1%) and patient education is high school (53.2%). Employment status of civil servant nurses (65.8%), patient work is mostly private (36%). The length of service for most nurses was > 5 years (83.7%) and the average length of patient care was 3-6 days (59.5%). The basic salary of most nurses is 3-5 million/month (39.2%).

Table 1.  
Frequency Distribution of Respondent Characteristics in the Inpatient Room (n=222)

Variable	Perawat		Pasien	
	f	%	f	%
Gender				
Man	65	29,3	90	40,5
Women	157	70,7	132	59,5
Nurse Age				
< 30 years old	19	8,6	-	-
30-39 years old	74	33,3		
40-49 years old	68	30,6		
≥ 50 years old	61	27,5		
Patient Age				
<17 years old	-	-	14	6,3
17-50 years old			157	70,7
>50 years old			51	23,0
Nursing Education				
D3 Nursing	104	46,8	-	-
S1 + Ners	109	49,1		
S2	9	4,1		
Patient Education				
SD	-	-	18	8,1
SMP			27	12,2
SMA			118	53,2
D3			30	13,5
S1			28	12,6
S2			1	0,5
Employee Status				
BLUD	42	18,9	-	-
Kontrak	5	2,3		
P3K	29	13,1		
PNS	146	65,8		
Patient Occupation				
Trader	-	-	42	18,9
Students			23	10,4
PNS/TNI/P3K/BLUD			19	8,6
Private			80	36,0
Doesn't Work			58	26,1
Length of Working				
< 1 years old	5	2,3	-	-
1-5 years old	31	14,0		
>5 years old	186	83,7		
Length of Patient Care				
<3 days	-	-	17	7,7
3-6 days			132	59,5
>6 days			73	32,9
Salary/Income				
<3 million/month	14	6,3	-	-
3-5 million/month	87	39,2		
5-8 million/month	58	26,1		
>8 million/month	63	28,4		

Table 2.

Analysis of the Implementation of a Digital-Based Nursing Management Information System with Nurse Job Satisfaction and Patient Satisfaction in the Inpatient Room (n=222)

Variable	Mean	SD	F	p-value
Nurse job satisfaction	73,87	11,109	18,474	0,000
Patient satisfaction	65,49	9,681		

Based on table 2, it can be seen that nurses and patients have different levels of satisfaction. This can be seen that the two respondents have different mean satisfaction scores, namely nurses 73.87 and patients 65.49 so the mean difference between respondents is 18.474, which means there is a large difference between the two respondents caused by the implementation of an information system. digital-based nursing is provided. The p-value is  $0.000 < 0.05$ , so according to the basis for decision-making in the test it can be concluded that  $H_0$  is rejected, which means that there is an influence of the implementation of a digital-based nursing management information system on nurses' job satisfaction and patient satisfaction with nursing services in the Inpatient Room.

## DISCUSSION

Most of the implementation of digital-based nursing information systems have been implemented optimally (96.8%). Nursing information systems relate to the application of health technology and information technology in the nursing field in the form of data, information, and knowledge in nursing care services (Damanik, 2020). This research is in line with the assessment of the completeness of electronic nursing care documentation in hospitals in East Java which states that most of the completeness of documentation in assessment, diagnosis, intervention, implementation, and evaluation is in a good category (Zamroni et al., 2021). This shows that the existence of a digital nursing information system encourages completeness of nursing care documentation. A digital-based nursing information system makes it easier for health service activities and nursing care to be more effective and efficient.

Nurse job satisfaction showed that the majority of respondents had a high score of (61.3%). Nurse job satisfaction is a model of the gap between expected performance standards and the actual performance received by customers (Nursalam, 2020). Nurse job satisfaction provides an overview of nurses' positive or negative feelings towards their work. If nurses are dissatisfied with their work, this will cause problems such as turnover, increased levels of absenteeism, and passive work behavior (Febrianita & Yunus, 2017). Nurses who are satisfied with their work with the nursing information system show a positive attitude. The nursing information system makes it easy to document nursing (Amalia et al., 2018). Nurses feel satisfied with the existence of a nursing information system because the nurse's workload becomes lighter, communication and collaboration between nurses and superiors becomes effective, the consequences of remuneration for income and promotion are more current, and development opportunities are higher.

Based on the research results, it is known that the majority of inpatients satisfaction are very satisfied, 57.2%. The results of previous research state that the factors that influence inpatient satisfaction are; benefit factors, personal interactions, personality, and location (M. M. W. Lestari et al., 2016). Patient satisfaction is a measuring tool for assessing the quality of health services, therefore service providers must improve the quality of health services by looking at the performance of services provided to patients (Rustifani et al., 2017). Customer satisfaction is a function of the difference between perceived performance and expectations. If performance is below expectations, then customers will be very disappointed, and if performance meets expectations, then customers will be satisfied (Hafid, 2017). Researchers

believe that patient satisfaction is a measuring tool for assessing the quality of health services. Respondents who said they were satisfied with receiving health services were influenced by the education and information they received regarding the procedures and benefits of using health services.

The application of nursing information systems is related to the application of health technology and information technology in the nursing field of nursing care in the form of assessment, diagnosis, planning, implementation, and evaluation (Damanik, 2020). The nursing information system aims to facilitate nurses' performance in the documentation of nursing care. The application of the nursing information system can be seen based on the completeness of documentation in the electronic medical record (EMR) (Zamroni, 2021). Patient satisfaction is the response or level of patient feelings obtained after the patient receives nursing services at the hospital by comparing the perceived performance results with the patient's expectations (W. Lestari et al., 2021). Patient satisfaction can be interpreted as the fulfillment of needs obtained from experience carrying out activities, work, or getting something according to the desired needs. Patient satisfaction can be measured through the quality of nursing services with five aspects, namely, reliability, assurance, tangible, empathy, and responsiveness (Nursalam, 2020).

This research is in line with Ismuntania & Kartika (2020), stating that there is a meaningful relationship between nursing services and the implementation of digital nursing information systems and the level of patient satisfaction. The nursing behavior and actions received by the patient will give rise to an experience for the patient. The experience of receiving nursing actions becomes the patient's perception regarding nursing services which provides an assessment of what the patient receives. A digital-based nursing information system makes it easier for nurses to do their nursing work so that the quality of nursing services increases (Suwignjo et al., 2022). Nursing behavior and actions will be reflected in the quality of nursing services which is related to patient satisfaction. Increasing the quality of nursing services will increase patient satisfaction (Pakpahan et al., 2022).

Based on the statement above, it is assumed that the nursing information system provides convenience in nurses' tasks and work so that it can improve the quality of nursing services. The quality of service is felt by patients so it is directly related to patient satisfaction. So, it is necessary to improve the quality of service and assess patient satisfaction regularly and continuously to determine the quality of health services in hospitals. Previous research found that good and correct electronic-based documentation can influence job satisfaction and will also improve service quality and hospital accreditation (Juniarti et al., 2020). Other research also found that there was a significant relationship between web-based nursing documentation and satisfaction in inpatient installations (Agung & Wijaya, 2017). According to researchers' assumptions, digital-based nursing documentation will be able to improve the quality of nursing services provided, while with good quality nursing services, it will be easy to create job satisfaction, due to reducing the burden on nurses in providing nursing services.

Other research conducted by Pangerapan, Palandeng, & Rattu (2018) also found that there was a relationship between physical evidence, responsiveness, and attention, and patient satisfaction at the Internal Medicine Polyclinic at the GMIM Pancaran Kasih General Hospital, Manado. Research conducted by Anggrianni, Adji, Mustofa, & Wajdi (2017) found that there was an influence on the performance of health workers on diabetes mellitus patient satisfaction. The researcher believes that there are statements from respondents (patients) regarding the friendliness and politeness shown by doctors, nurses, and service staff when

servicing patients. The hospital always responds to complaints of illness submitted by patients well and quickly, and the consultation process when checking their health goes well. So that the patient feels happy with the interactions that occur, giving the patient satisfaction and trust in the hospital.

## CONCLUSION

Nurses' job satisfaction is higher than the satisfaction of inpatients with inpatient nursing services with the implementation of a digital-based nursing information system at Dr Soetomo Hospital, Surabaya. Implementation of a digital nursing information system provides nurses with effectiveness and efficiency in carrying out their duties. This makes the workload of nurses lighter increases the productivity of the quality of nursing received by patients and has an impact on patient satisfaction. Therefore, nursing management is expected to improve the implementation of supervision of nursing care documentation by looking at the completeness and suitability of SOPs in the nursing information system (SIK). In addition, nursing management needs to develop a nursing information system (SIK) model in collaboration with the hospital information technology team so that nurses are effective and efficient in implementing nursing care documentation.

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