



The Impact of Nursing Care Management Implementation on the Improvement of a Centralized Nursing Information System

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ABSTRACT

Nursing care management improves the centralized nursing information system by ensuring accurate documentation, efficient workflows, and better technology training, as well as supporting clinical decision-making with quality data. This study aims to assess the impact of nursing care management implementation on the improvement of the centralized nursing information system at IS Makassar Hospital in 2023. A quasi-experimental design with pretest and posttest was used, involving a control group, with a sample size of 110 nurses from 4 inpatient wards participating in the study through total sampling. Data were analyzed using the Wilcoxon test and independent paired t-test. The results showed a significant impact of nursing care management implementation on the centralized nursing information system. The intervention group had a p-value of 0.002, and the difference between the intervention and control groups showed a p-value of 0.0002. These findings indicate that structured nursing care management improves nurses' documentation skills and knowledge. It is recommended to explore the optimization of continuous training for nurses in the use of the centralized nursing information system, and to conduct a long-term evaluation of the impact of nursing care management implementation on the quality of documentation.



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INTRODUCTION

The advancement of knowledge and information technology has significantly impacted how society interacts with various services, including healthcare services.¹ This has led to a more critical approach to the quality of services provided. As healthcare professionals, nurses are expected to perform good and standardized nursing care management, which includes accurate and complete documentation and reporting.² Proper nursing care management is not only crucial for delivering optimal care but also serves as valid evidence in resolving issues that may arise between patients and nurses. Therefore, nursing care management plays a vital role in improving the overall quality of healthcare services.³

However, research findings on the implementation of nursing care management indicate that there is often incompleteness, particularly regarding diagnosis and nursing interventions. Studies

have shown that the completeness of nursing diagnoses is only 79%, while nursing interventions are documented at only 74%.⁴ This reflects the low quality of nursing care management. Audits of nursing care management have also highlighted issues with disorganized and inadequate record-keeping and reporting systems. A study of 40 medical records revealed that many nurses did not arrange diagnoses and interventions according to established guidelines.⁵ Furthermore, over half of the nurses simply copied diagnoses and interventions from previous records, which tends to compromise the accuracy and quality of the nursing care data. This poor quality of nursing care management has a negative impact on communication between nurses and other healthcare professionals, which can risk patient care outcomes.⁶

Several factors contribute to the low quality of nursing care management, one of which is the lack of clear guidelines for implementing nursing care management according to the established standards.⁷ In addition, issues such as the low nurse-to-patient ratio, limited training opportunities for nurses, and ineffective leadership also play a role in this problem. Therefore, there is a need for efforts to improve nursing care management to enhance the quality of healthcare services.⁸

Effective nursing care management can significantly contribute to the improvement of centralized healthcare information systems in hospitals.⁹ By implementing more systematic nursing care management, the resulting data will be more complete and accurate.¹⁰ This will strengthen the centralized healthcare information system, ultimately improving the efficiency, accuracy, and safety of healthcare services.¹¹ A centralized system relies on accurate and timely data, which can only be achieved through well-organized nursing care management.¹² Thus, implementing effective nursing care management not only impacts the quality of care provided but also contributes to the enhancement of the centralized information system that supports better clinical decision-making.¹³

The implementation of nursing care management has significant implications, particularly in optimizing patient outcomes and operational efficiency within healthcare systems. It fosters improved coordination among healthcare teams, enhances the accuracy and timeliness of clinical decision-making through centralized information systems, and reduces the risk of medical errors. Additionally, this approach supports evidence-based practices, ensuring that patient care aligns with the latest standards and guidelines, ultimately leading to increased patient satisfaction and trust in healthcare services.¹⁴

Based on these factors, this research aims to investigate the impact of nursing care management on the improvement of centralized healthcare information systems at RS IS Makassar. The study is expected to provide insights into how the implementation of good nursing care management can improve the quality of healthcare information systems, which in turn will contribute to the enhancement of healthcare service quality at the hospital.

METHODS

The research method used is a quasi-experimental design with pre-test and post-test and a control group design. This study was conducted in four inpatient wards at IS Makassar Hospital, namely AS and FR wards for the intervention group, and AR and MN wards for the control group. IS Makassar Hospital was selected because it has complete facilities and is a referral hospital in Eastern Indonesia, which has implemented a centralized nursing information system. The hospital also has many nurses with diverse backgrounds and experiences, providing insight into the implementation of nursing care management in a hospital setting that is constantly updated by all its nurses. All nurses in the four wards at IS Makassar Hospital were selected as research subjects. The sampling technique used was total sampling, involving 110 nurses, who were divided into two groups: 55 nurses in the intervention group and 55 nurses in the control group. The characteristics of the research subjects included varying levels of experience and qualifications, with work experience ranging from 1 to 10 years, and educational qualifications including nurses

with a D3, Bachelor's degree in Nursing, and several of them having attended specialized training related to nursing care management. The instrument used was a questionnaire measuring knowledge about nursing care management and documentation quality, which had been validated by experts. Data were analyzed using the Wilcoxon test and independent paired t-test, with normality and homogeneity tests conducted beforehand.

This study has received ethical approval from the health research ethics committee (No. RK.156/KEPK/STIK/II/2024), and all participants were informed about the purpose, procedure, and their rights and provided written consent to participate. The data obtained were kept confidential and were used solely for research purposes. The instrument used was a knowledge questionnaire containing material related to nursing care management and the centralized nursing information system. Data were analyzed using the non-parametric Wilcoxon test and independent paired t-test. This research was conducted from September 24, 2022, to January 24, 2023, in the AS Inpatient Ward at IS Makassar Hospital for the intervention group and the AR Inpatient Ward at IS Makassar Hospital for the control group.

RESULTS

Based on Table 1, most respondents were female (56.4%) compared to males (43.6%), with a balanced distribution between the intervention and control groups. Most respondents were aged 31–40 years (39.1%), followed by those aged >40 years (30.9%) and ≤30 years (30.0%). In terms of education, the majority held a Bachelor's degree (60%), followed by those with a Diploma (28.2%) and a Master's degree (11.8%). Regarding work experience, most respondents had 6–10 years of experience (49.1%), while those with ≤5 years and >10 years accounted for 24.5% and 26.4%, respectively. These percentages reflect a balanced and relevant respondent profile to support the validity of the study.

Table 1. Description of Characteristic Respondent

Variables	Intervention		Control		Total	
	(n=55)	%	(n=55)	%	n	%
Gender						
Male	26	47.3	22	40.0	48	43.6
Female	29	52.7	33	60.0	62	56.4
Age (years)						
≤ 30	17	30.9	16	29.1	33	30.0
31–40	18	32.7	25	45.5	43	39.1
> 40	20	36.4	14	25.5	34	30.9
Education Level						
Diploma	16	29.1	15	27.3	31	28.2
Bachelor's Degree	30	54.5	36	65.5	66	60.0
Master's Degree	9	16.4	4	7.3	13	11.8
Work Experience (years)						
≤ 5 years	14	25.5	13	23.6	27	24.5
6–10 years	26	47.3	28	50.9	54	49.1
> 10 years	15	27.3	14	25.5	29	26.4

Based on table 2, the pre-test results for both groups, namely the intervention group and the control group, show relatively balanced average knowledge scores, at 21.41 and 21.86, respectively. This indicates that, prior to the nursing care management intervention, the baseline knowledge level between the two groups was almost identical. The slight difference in standard deviation, with a value of 1.652 in the intervention group and 2.541 in the control group, suggests that knowledge distribution was more consistent in the intervention group compared to the control group, which had a wider range of scores.

Table 2. Description of nurses' knowledge in compiling in nursing care management implementation

Descriptive Data	N	Min	Max	Mean	Median	Std. Deviation
Intervention group (Pre-Test)	55	18	24	21.41	22.20	1.652
Control group (Pre-Test)	55	18	26	21.86	21.20	2.541

This data is important for the research topic, as it demonstrates that both groups had comparable baseline knowledge levels. This ensures that comparing changes in knowledge levels after the intervention will provide a more accurate evaluation of the effect of nursing care management on the improvement of a centralized information system. Thus, the study results assess whether the intervention system has a significant impact on the knowledge needed to strengthen the centralized information system in nursing.

Table 3. Description of nurses' knowledge in preparing nursing care management implementation

Descriptive Data	N	Min	Max	Mean	Median	Std. Deviation
Intervention group (Post-Test)	55	22	32	25.62	25.10	2.522
Control group (Post-Test)	55	20	26	21.50	21.13	2.811

Based on Table 3, the post-test results show that the 20 respondents' intervention group achieved an average knowledge score of 25.62 with a median of 25.10, a minimum score of 22, and a maximum score of 32. The standard deviation of 2.522 indicates that the distribution of knowledge scores in the intervention group was relatively consistent. Meanwhile, the control group, also consisting of 20 respondents, had an average score of 21.50 with a median of 21.13, a minimum score of 20, and a maximum score of 26, with a standard deviation of 2.811, indicating slightly greater variation in their knowledge distribution.

The interpretation of these values shows that, after the nursing care management intervention, there was a significant increase in knowledge in the intervention group compared to the control group, which did not receive the intervention. The higher average score in the intervention group demonstrates that nursing care management effectively improved understanding related to the centralized information system among nurses. The lower standard deviation in the intervention group also indicates that this increase in knowledge was more evenly distributed, reflecting better consistency in understanding after the intervention.

Table 4. The impact of nursing care management implementation on the improvement of a centralized nursing information system

Data	N	Mean	Mean difference	p value
Intervention group (Pre-Test)	55	21.41		
Control group (Post Test)	55	25.62	4.21	0.002

Based on Table 4 above, the mean value in the intervention group (post-test) showed an increase compared to the group (pre-test) with a difference of 4.21, resulting in a p-value of 0.002. Therefore, the decision is that the p-value < p-alpha (0.05), so it can be concluded that Ho is rejected and Ha is accepted. This means that there is an influence of nursing care management on the improvement of the centralized information system at IS Makassar Hospital in 2023.

The research successfully proved that improving the quality of nursing care management can influence the effectiveness of data collection, recording, or utilization within a centralized

information system. Thus, these findings can serve as a basis for broader decision-making or policy development to enhance the efficiency and quality of healthcare services.

DISCUSSION

Good knowledge of nursing care management for the improvement of a centralized information system is an essential part of effective and high-quality nursing practice.¹⁰ Accurate and organized data and information management can provide significant benefits to patients, such as helping to monitor patient conditions, identifying health issues that require further intervention, and ensuring that the care provided meets applicable nursing standards.¹¹ Knowledge is the result of a process consisting of four stages: observation, interpretation, evaluation, and communication. Knowledge not only includes information but also the understanding and use of that information in relevant contexts.¹⁸

Better nursing care management can have a significant positive impact on improving patient safety, with more complete and systematic documentation, the risk of medical errors can be minimized, as information is more accurate and can be easily accessed by all healthcare team members.¹⁹ This enables more timely actions that are appropriate to the patient's condition, as well as facilitating better communication between doctors, nurses, and other medical staff. Moreover, better nursing care management can also reduce confusion among the medical team in decision-making and minimize potential errors in the care process, which in turn will enhance the quality and safety of care.¹⁵

The knowledge possessed by both the intervention group and the control group, based on the level of knowledge, falls into the category of insufficient knowledge.¹⁶ Knowledge is not an absolute truth but is always in a developmental stage and can change along with the progress of science and technology. Therefore, one must always be open to change and update their knowledge to adapt to the changes occurring around them. Knowledge is influenced by both internal and external factors.²⁰ In this study, the internal factors that affect knowledge include age, education, and experience or length of employment.²¹

This is in line with the findings of the research at IS Makassar Hospital, which showed a difference in knowledge scores between the intervention and control groups, with a p-value of 0.002. Knowledge improvement is influenced by many factors, one of which is experience or length of employment. The more experience a nurse has, the more their ability to capture information and think critically develops.²²

The novelty of this study lies in examining the impact of implementing nursing care management on the improvement of a centralized nursing information system in hospitals. This research contributes new insights by linking better nursing care management with the enhancement of the quality and accuracy of information within the centralized nursing information system, while also identifying factors that influence the improvement of nurses' knowledge and skills. Additionally, the study explores practical challenges in the implementation of nursing care management, such as hospital infrastructure issues, resource limitations, and resistance from medical staff, and proposes practical solutions such as continuous training and management support to overcome these barriers. Therefore, this study provides a comprehensive perspective on the impact of nursing care management on the improvement of centralized nursing information systems, which can be applied in other hospitals to enhance healthcare service quality through information technology.

However, there are some potential limitations in this study that need to be considered.¹⁷ The small sample size and the fact that it was conducted in a single hospital may affect the generalizability of the study's findings. Acknowledging these limitations provides a more balanced interpretation of the results, allowing readers to consider the context and limitations when evaluating the impact of the intervention.

In addition, challenges in implementing nursing care management in other hospitals need to

be addressed. Possible barriers, such as differences in hospital infrastructure, resource limitations, or resistance from medical staff to procedural changes, should be taken into account.²³ Proposed solutions include continuous training for healthcare staff, increased support from hospital management, and integrating nursing care management into existing hospital information systems. This would make the discussion more relevant to healthcare administrators and policymakers who need to consider these factors when expanding the implementation of nursing care management in other healthcare facilities.²⁴

CONCLUSION

The implementation of nursing care management has greatly improved the efficiency and effectiveness of a centralized nursing information system. This system has streamlined the management of patient information, enhanced communication among healthcare providers, and reduced the likelihood of errors. As a result, the overall quality of nursing care has improved, leading to better patient outcomes and increased satisfaction among both patients and healthcare professionals.

Recommendation to sustain these improvements, it is essential to provide ongoing training for nursing staff to fully utilize the system's capabilities. Additionally, regular updates and customization of the system should be carried out to meet the changing needs of the healthcare environment. Strengthening collaboration between nursing and IT teams will further ensure the system's effectiveness in supporting high-quality nursing care.

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