

Effect of Telehealth Implementation on the Quality of Nursing Care in Chronic Disease Patients

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ABSTRACT

Chronic diseases require continuous nursing care; however, barriers such as limited access to services, low frequency of control, and suboptimal communication between nurses and patients especially in outpatient settings are still common. Telehealth has emerged as an alternative service, yet its effect on the quality of nursing care requires further scientific investigation. This study aimed to analyze the effect of telehealth implementation on the quality of nursing care in patients with chronic diseases. A quantitative study with a cross-sectional design was conducted at Semen Padang Hospital involving 120 patients selected through purposive sampling. Data were collected using questionnaires measuring nursing care quality, including assessment, planning, implementation, evaluation, and therapeutic communication. Telehealth variables included technology use, service accessibility, and digital interaction between healthcare providers and patients. Data were analyzed using simple linear regression with a significance level of 0.05. The results showed that 68.3% of respondents rated telehealth implementation as good, while 72.5% rated nursing care quality as good. Regression analysis revealed a significant positive effect ($p=0.001$; $\beta=0.462$), with an R^2 value of 0.213, indicating that telehealth contributed 21.3% to nursing care quality improvement. In conclusion, telehealth significantly improves nursing care quality and can support sustainable healthcare service development.

Keyword : Telehealth, Nursing, Quality, Chronic

INTRODUCTION

The development of Information Technology has brought major changes in the health care system in various countries. Digital transformation encourages the emergence of various service innovations aimed at improving access, efficiency, and quality of Health Services. One of the sectors that is significantly affected is nursing services as an integral part of the health care system. Nurses are required to be able to adapt to technology in order to provide quality and sustainable care. The use of technology in health services is known as telehealth. Telehealth enables remote healthcare delivery through digital communication media such as telephones, apps, and online platforms. The implementation of telehealth is an alternative solution in facing the limited access to conventional health services. This innovation is increasingly relevant as the need for technology-based health services increases (WHO, 2020).

Telehealth has an important role in supporting nursing services, especially in monitoring the patient's condition on an ongoing basis. Nurses can conduct assessment, education, and evaluation of Nursing without having to meet face to face. This provides flexibility for patients and healthcare workers. Thus, telehealth has the potential to improve the quality of nursing care as a whole (Setiawan et al., 2021).

Chronic disease patients are the group most in need of sustainable health services. Chronic diseases generally last a long time and require long-term monitoring and management. The role of nurses is very important in helping patients manage their health conditions. Consistent nursing care is key in preventing complications and deterioration in the patient's quality of life (Smeltzer & Bare, 2020).

In the field, nursing services in chronic disease patients still face various problems. Limited visit time and high burden of services cause patient monitoring is not optimal. In addition, distance and geographical conditions are often obstacles for patients to carry out routine controls. This problem has an impact on the declining quality of nursing care (Sari & Putri, 2021).

Another frequently encountered problem is the patient's low adherence to medication and treatment. The lack of continuous communication between nurses and patients is one of the main causes. Patients often do not receive adequate education after discharge from a health facility. This condition increases the risk of recurrence and complications of chronic diseases. In addition, there are still some obstacles related to the policy and utilization of technology in health services, such as not optimal implementation of telehealth policies in health care facilities, limited knowledge and skills of health workers in using digital technology, and uneven availability of technological infrastructure such as internet networks and supporting devices. On the other hand, some patients still have limitations in digital literacy and the use of health applications, so the use of telehealth services has not been able to run optimally in supporting the continuity of nursing care (Hidayat, 2020).

The quality of nursing care is the main indicator of the quality of Health Services. Quality nursing care includes comprehensive assessment, proper planning, effective implementation, and continuous evaluation. If one of these components is not met, then the results of nursing services



become not optimal. Therefore, improving the quality of nursing care is an urgent need (Potter & Perry, 2021).

The lack of quality nursing care in patients with chronic diseases can have serious consequences. Patients are at risk of complications, decreased function, up to an increase in hospitalization rates. The impact also increases the burden of health care costs. In addition, the quality of life of patients and their families has also decreased (WHO, 2021).

Telehealth comes as a solution to overcome these problems. With telehealth, nurses can follow up periodically without being limited by distance and time. Patients can consult and report their health condition more easily. This allows for more continuous and responsive nursing care (Lestari & Nugroho, 2020).

The implementation of telehealth also encourages increased involvement of patients in self-care. The patient becomes more active in monitoring his state of Health and following the recommendations of the nurse. This active involvement contributes to the successful management of chronic diseases. Thus, telehealth plays a role in improving the quality of nursing care indirectly (Rahmawati et al., 2020).

Several studies have proven the benefits of telehealth in nursing services. Research shows an increase in therapeutic communication and patient satisfaction after the implementation of telehealth. In addition, telehealth helps nurses in systematically monitoring the patient's condition. This result shows the potential of telehealth in improving the quality of Nursing Services (Pratama & Yuliana, 2021).

Other studies have also found that telehealth has an effect on the effectiveness of nursing care documentation. Documentation is becoming more structured and accessible to health workers. This supports the continuity of Nursing Services. With good documentation, the evaluation of nursing care can be done more accurately (Utami & Sulastris, 2022).

Nevertheless, the implementation of telehealth is inseparable from various challenges. Human Resource readiness is one of the important factors in the successful implementation of telehealth. In addition, the technological infrastructure and digital literacy of patients also affect the effectiveness of services. Without adequate readiness, telehealth cannot provide optimal benefits (Kemenkes RI, 2021).

Evaluation of the impact of telehealth implementation is necessary to ensure the quality of Nursing Services. This evaluation can be done through measuring the quality of nursing care objectively. The results of the evaluation form the basis for managerial and clinical decision-making. Thus, the development of telehealth can be carried out on an ongoing basis (Nursalam, 2021).

Hospitals have a strategic role in integrating telehealth into the nursing service system. As a health care institution, hospitals are required to innovate in order to improve service quality. Telehealth is one form of innovation that is relevant to today's needs. Good integration will increase the effectiveness of nursing care (Handayani et al., 2021).

The implementation of telehealth in hospitals also needs to be adjusted to the characteristics of patients. Chronic disease patients need a holistic and sustainable approach. Therefore, telehealth

must be designed to optimally support the role of the nurse. This adjustment will improve the quality of nursing care provided (WHO, 2020).

Semen Padang Hospital is one of the hospitals in Padang that has implemented telehealth services. This hospital serves a variety of chronic disease patients with a fairly high number of visits. Telehealth is applied as an effort to improve access and quality of Service. This shows the commitment of the hospital in innovating in the field of Health Services. The application of telehealth in Semen Padang Hospital provides an opportunity for scientific studies to be carried out. The existence of telehealth systems that have been running allows researchers to measure the impact directly. In addition, hospital management support is a supporting factor for the implementation of research. This condition strongly supports research based on nursing services (Semen Padang Hospital, 2022).

Until now, research on the effect of telehealth on the quality of nursing care in chronic disease patients is still limited, especially in the West Sumatra region. These limitations indicate a research gap that needs to be filled. Local research is essential to provide a contextual picture. The results of the research can be used as a basis for the development of service policies (Yanti & Fadhilah, 2021).

Based on the description, the researchers were interested to examine the effect of telehealth application on the quality of nursing care in patients with chronic diseases in Semen Padang hospital. This research is expected to contribute scientifically to the development of technology-based nursing. In addition, the results of the study can be input for hospitals in improving service quality.

METHODS

This study is a quantitative research with cross sectional design conducted at Semen Padang Hospital. The population in this study is all chronic disease patients who use telehealth services. The sample of 120 respondents was selected using purposive sampling technique with inclusion criteria including patients aged 18 years, diagnosed with chronic diseases for at least 6 months, have used telehealth services at least twice, and are able to communicate well and are willing to be respondents. The exclusion criteria included patients with cognitive impairment, acute conditions, or not completing the questionnaire completely. This study has obtained research ethics approval from the competent Ethics Committee, and all respondents were given research explanations and signed informed consent before data collection.

Data collection using Nursing Care Quality questionnaires covering aspects of assessment, planning, implementation, evaluation, and therapeutic communication. Telehealth implementation variables using questionnaires that include aspects of the use of telehealth technology, ease of access to services and interaction between health workers and patients through digital media. Data analysis was conducted in stages including univariate analysis to describe the characteristics of respondents, as well as bivariate analysis using a simple linear regression test to determine the effect of the application of telehealth on the quality of nursing care. The significance level used in this study is 0.05, so that the results of the analysis are declared meaningful if the value of $p < 0.05$.



RESULTS

1. Distribution of Respondents Based on the Implementation of Telehealth and Quality of Nursing Care

Univariate analysis was conducted to describe the distribution of respondents based on the implementation of telehealth and the quality of nursing care in chronic disease patients at Semen Padang Hospital.

Table 1. Distribution of Respondents Based on the Implementation of Telehealth and Quality of Nursing Care (n = 120)

Variable	Category	Frequency (f)	Percentage (%)
Application of Telehealth	Baik	82	68,3
	Cukup	38	31,7
Quality of Nursing Care	Baik	87	72,5
	Cukup	33	27,5

Based on Table 1, most respondents considered the application of telehealth to be in the good category, namely as many as 82 respondents (68.3%), while 38 respondents (31.7%) considered the application of telehealth in the sufficient category. The quality of nursing care is also mostly in the good category as many as 87 respondents (72.5%), while 33 respondents (27.5%) assess the quality of nursing care in the sufficient category. This result shows that in general, the application of telehealth and the quality of nursing care at Semen Padang Hospital is quite good.

2. Effect of Telehealth Implementation on the Quality of Nursing Care

Table 2. Effect of Telehealth Implementation on the Quality of Nursing Care

Independent Variable	Dependent Variable	Regression Coefficient (B)	R ²	P value
Application of Telehealth	Quality of Nursing Care	0,462	0,213	0,001

Based on Table 2, the results of a simple linear regression test showed a regression coefficient (B) of 0.462 which means there is a positive relationship between the application of telehealth and the quality of nursing care. The coefficient of determination (R²) value of 0.213 indicates that the application of telehealth contributes 21.3% to improving the quality of nursing care. P value of 0.001 ($p < 0.05$) indicates that the application of telehealth significantly affect the quality of nursing care in patients with chronic diseases in Semen Padang Hospital.

DISCUSSION

1. Respondents Based On The Implementation of Telehealth and Quality of Nursing Care

The results of the univariate analysis showed that most respondents assessed the implementation of telehealth at Semen Padang Hospital in the good category, amounting to 68.3%.

This shows that the telehealth services implemented have been well received by chronic disease patients. Ease of access, time flexibility, and easier communication with nurses are the main supporting factors. The quality of nursing care is mostly in the good category, which is equal to 72.5%. This shows that nursing care provided to chronic disease patients has met nursing standards that include assessment, planning, implementation, evaluation, and therapeutic communication.

Univariate results also showed a positive relationship between the use of telehealth and patient perceptions of the quality of Nursing Services. Telehealth allows nurses to conduct regular monitoring, provide education, and evaluate the patient's condition without having to meet face to face. Further analysis showed that patients felt more involved in the treatment process when using telehealth. They are more active in reporting symptoms, following therapy, and asking about their state of Health.

The findings of Lestari & Nugroho (2020) which states that telehealth increases the effectiveness of therapeutic communication. This confirms that telehealth is one of the important factors, but it cannot stand alone in improving the quality of care and telehealth supports the sustainable management of chronic diseases (Utami & Sulastri, 2022). This is consistent with the research of Handayani et al. (2021) which showed that telehealth-based monitoring lowers the risk of complications in chronic disease patients. which emphasizes the need for training and infrastructure support for telehealth success.

Similarly, Rahmawati et al. (2020) which emphasizes the importance of continuing education for chronic patients. This indicates that telehealth can improve continuity of care and support patient involvement in the management of their own disease. This problem is in line with Lestari & Nugroho's (2020) research which found that technological constraints can affect the effectiveness of telehealth. Pratama & Yuliana (2021) revealed that telehealth increases patient satisfaction and continuity of Service. * From the perspective of previous research, telehealth has been shown to help manage chronic diseases such as diabetes and hypertension by improving drug adherence, monitoring, and health education.

This finding is in line with the Indonesian Ministry of Health (2020) which states that telehealth can improve access to health services effectively and efficiently. The positive assessment of telehealth is also supported by the convenience of patients in carrying out remote consultations. Many patients feel safer not having to travel to the hospital, especially for patients with limited mobility or a high risk of infection. This is consistent with the Technology Acceptance Model (TAM) theory which states that the perception of ease of use affects the acceptance of technology (Davis, 2020). This finding is in line with Potter and Perry (2021) who emphasize that optimal nursing care quality contributes to patient safety and satisfaction.

In the context of Nursing Theory, The Chronic Care Model approach emphasizes the importance of continuous coordination and communication between patients and health workers to manage chronic diseases. Telehealth can be a medium that supports this model by providing routine monitoring and distance education (Wagner et al., 2020). This activity supports the theory of Patient-



Centered Care, where patient involvement is an important indicator of service quality (Nursalam, 2021).

The Self-Management theory perspective states that patient involvement in the management of chronic disease largely determines long-term clinical outcomes. Telehealth provides a platform for patients to report symptoms, monitor blood pressure or blood sugar, and receive nurse advice in real-time (Wagner et al., 2020). This improves the patient's ability to manage their health condition.

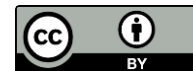
The implementation of telehealth contributes to the effectiveness of hospital management. Remote services help reduce the density of patient visits, optimize Nurse time, and improve service efficiency. Thus, telehealth has an impact not only on patients but also on the health care system as a whole (Ministry of Health, 2020).

The researchers' analysis showed that the quality of good nursing care is closely related to the frequency of telehealth use. Patients who use this service more often tend to give a higher assessment of the quality of Service. Telehealth provides advantages in continuous monitoring of the patient's condition. Nurses can detect changes in health conditions faster and intervene early. Telehealth also plays a role in supporting health education. Patients receive information on the management of the disease at regular intervals through online consultations, text messages or mobile applications. This consistent education helps patients understand their condition and improves adherence to therapy.

According to the researchers, the assessment of patients shows that a small percentage of patients still rate telehealth and the quality of nursing care in the category of insufficient. This suggests that there are barriers to telehealth utilization, such as digital literacy, face-to-face consultation preferences, or device limitations. The results of this study indicate that telehealth plays a significant role in supporting therapeutic communication between nurses and patients. Good communication improves the patient's compliance, monitoring and understanding of his health condition. Frequency of telehealth use correlates with increased patient satisfaction. Patients who routinely use telehealth tend to feel more cared for, Get a quick response from a nurse, and feel safer. The success of telehealth is also influenced by hospital support and nurse competence. Nurse training in the use of technology and remote communication is an important factor.

2. Effect of Telehealth implementation on the quality of Nursing Care

The results of bivariate analysis using a simple linear regression test showed that the application of telehealth has a significant effect on the quality of nursing care with a value of $p = 0.001$ ($p < 0.05$). The regression coefficient value of 0.462 indicates a positive relationship, meaning that the better the application of telehealth, the higher the quality of nursing care. This finding confirms that telehealth is not only a means of communication, but also as a major support in the implementation of sustainable nursing care. The coefficient of determination (R^2) value of 0.213 indicates that the application of telehealth contributes 21.3% to improving the quality of nursing care.



This finding is in line with research by Pratama and Yuliana (2021), which states that telehealth makes a significant contribution to the quality of nursing services, although it is still influenced by other supporting factors. Lestari and Nugroho's (2020) research supports these findings, mentioning that telehealth improves continuity of nursing care and patient involvement in self-care.

These findings are supported by the results of research Rahmawati et al. (2020), which states that telehealth facilitates proactive monitoring of chronic disease patients. The researchers' analysis showed that patients who actively used telehealth tended to have a better quality of care. Handayani et al. (2021), also shows that telehealth can improve the quality of nursing services through continuous monitoring and timely intervention.

In addition, telehealth facilitates therapeutic communication between nurses and patients. The availability of fast and continuous lines of communication makes patients feel more cared for and safe. This condition supports the theory of Communication Theory in nursing which states that effective communication between nurses and patients is the key to quality care (Potter & Perry, 2021).

Telehealth also provides convenience in the delivery of Health Education. Patients can receive information regarding disease management, therapy adherence, and complication prevention measures through online consultations or mobile applications. This is in line with Self-Management Theory, which emphasizes that patient empowerment through information and education improves long-term health outcomes (Wagner et al., 2020). The researchers' analysis showed that consistent education through telehealth improved patient adherence to treatment plans.

The results of this study showed that patients were more active in reporting their symptoms or changes in their condition through telehealth. This activity increases patient engagement and allows nurses to intervene more quickly. In addition, telehealth supports the implementation of a Chronic Care Model that emphasizes continuous coordination between patients and health workers (Wagner et al., 2020). With regular monitoring and remote consultations, patients remain supervised, so the risk of complications can be reduced. The researchers' analysis showed that the integration of telehealth into the chronic care model improves the overall effectiveness of care.

Telehealth also allows nurses to provide real-time follow-up. If there is a change in symptoms, the nurse can immediately provide appropriate advice or action. This supports the Patient-Centered Care theory, which emphasizes patient involvement as a key indicator of service quality (Nursalam, 2021).

The regression coefficient value of 0.462 indicates that any improvement in the quality of telehealth implementation will significantly improve the quality of nursing care. This suggests a positive causal relationship that can be used as the basis for managerial intervention in the hospital. The R² value of 0.213 indicates that telehealth contributes 21.3% to the variation in the quality of nursing care. The rest is influenced by other factors such as nurse competence, management support,



and patient condition. The researchers' analysis emphasizes that telehealth is not the only factor, but one of the main drivers of improving the quality of care.

In addition to monitoring, telehealth helps reduce the risk of late intervention. With remote communication access, nurses can identify health problems more quickly. This is important for chronic patients who require rapid follow-up to prevent serious complications. The implementation of telehealth also plays a role in Nurse time management. With online consultations, nurses can optimize visit schedules and focus on patients who need immediate action. This supports the Efficiency in Nursing Care theory, which states that technology can increase the effectiveness of care without reducing quality (Potter & Perry, 2021).

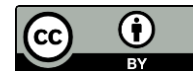
Telehealth supports patient engagement in health decision making. Patients can consult directly and inquire about various therapy options, thus increasing their understanding and participation. The results of this study also show that telehealth helps reduce the administrative burden on hospitals. With electronic medical records and online consultations, documentation becomes more efficient and accurate. This is in accordance with the theory of Health Information Technology Integration which emphasizes that the use of information technology improves service quality (Rahmawati et al., 2020). The researchers' analysis showed that administrative efficiency contributes to the overall quality of nursing care.

Telehealth also significantly improves patient satisfaction. Patients feel more secure, cared for, and supported in the management of their illness. This supports the theory of Patient Satisfaction in e-Health, which emphasizes the importance of patient experience to the use of technology in health services (Handayani et al., 2021).

The results of this study show that telehealth helps improve the continuity of nursing care. Regular Monitoring, continuing education, and effective communication make patients feel accompanied throughout the treatment process. These findings are consistent with The Theory of Continuity of Care, which emphasizes the importance of continuous service for chronic patients (Wagner et al., 2020).

The researchers' analysis shows that the implementation of telehealth helps speed up the process of evaluating the patient's condition. With this technology, nurses can monitor vital signs and symptoms periodically without having to make direct visits every time. This allows early detection of changes in the patient's condition, especially for those who suffer from chronic diseases and require long-term monitoring. The quality of communication is a factor that strengthens the relationship between telehealth and quality of service, where patient involvement through telehealth strengthens the effectiveness of care and increases patient satisfaction. Patient satisfaction can be an indicator of successful implementation of telehealth. It emphasizes that this continuity increases the effectiveness of chronic disease management.

In addition to its clinical impact, telehealth contributes to hospital management decision-making. Hospitals can plan resource allocation based on remote monitoring, making them more responsive to patient needs. The researchers' analysis emphasizes that active involvement of



patients is an important indicator of quality of care, where telehealth data-driven planning reinforces the overall quality of care.

Overall, the results of this study indicate that the implementation of telehealth at Semen Padang Hospital has a positive impact on the quality of nursing care for chronic disease patients. Telehealth improves continuity, Communication, Education, Monitoring, and patient engagement, resulting in better quality of care. The researchers' analysis confirms that telehealth can be used as a key strategy in the management of chronic patients and the development of technology-based nursing services.

CONCLUSIONS

The results showed that the majority of chronic disease patients at Semen Padang Hospital rated the implementation of telehealth in the good category, which was 68.3%. In addition, the quality of nursing care received by patients was also mostly in the good category, namely 72.5%. These findings indicate that patients respond positively to the use of telehealth, both in terms of Service Access, Ease of communication, and satisfaction with the care process provided by nursing personnel.

Bivariate analysis using simple linear regression showed a positive and significant influence between the application of telehealth on the quality of nursing care, with a value of $p = 0.001$ ($p < 0.05$) and regression coefficient of 0.462. That is, the better the implementation of telehealth, the higher the quality of nursing care received by patients. These results confirm that telehealth is not only a means of communication, but also plays a major supporting role in the implementation of nursing care that is sustainable and responsive to the needs of patients. The coefficient of determination (R^2) value of 0.213 indicates that telehealth contributes 21.3% to improving the quality of nursing care. Thus, it can be concluded that the application of telehealth has a significant effect on the quality of nursing care for chronic disease patients at Semen Padang hospital, as well as being an effective strategy to improve the quality of technology-based nursing services.

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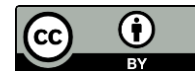
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