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ANALYSIS OF THE RELATIONSHIP BETWEEN TELEMEDICINE USERS AND THE QUALITY OF HEALTH SERVICES FOR JKN PATIENTS AT FKTP FLAMINGO CLINIC OF SOEWONDO AIR BASE

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Abstract

Telemedicine has become an important innovation in digital health services to improve healthcare accessibility and quality, particularly for National Health Insurance (JKN) participants in Indonesia. This study aimed to analyze the relationship between telemedicine utilization and healthcare service quality among JKN patients at the Primary Healthcare Facility (FKTP) Flamingo Clinic, Lanud Soewondo, Medan. This study used a quantitative approach with a cross-sectional design. The sample was selected using a total sampling technique, involving all JKN patients who utilized telemedicine services at FKTP Flamingo Clinic during the research period. Data were collected using structured questionnaires measuring respondent characteristics (age, gender, occupation, and frequency of telemedicine use) and telemedicine service factors, including perceived usefulness, ease of use, interface quality, interaction quality, and system reliability. Data analysis was conducted using univariate analysis and bivariate analysis with the Chi-square test. The results showed that respondent characteristics such as age (p=0.614), gender (p=0.636), occupation (p=0.190), and frequency of telemedicine use (p=0.467) were not significantly associated with healthcare service quality. However, perceived usefulness, ease of use, interface quality, interaction quality, and reliability were significantly associated with healthcare service quality (p<0.05). These findings indicate that technological usability and communication quality in telemedicine services play an important role in improving patient satisfaction and healthcare service quality.

Keywords: healthcare service quality, JKN patients, telemedicine, telemedicine utilization, telemedicine services.

INTRODUCTION

The rapid advancement of digital technology has significantly transformed healthcare systems worldwide, particularly by improving accessibility, efficiency, and service quality. One of the most influential innovations in digital health is telemedicine, which enables healthcare professionals to deliver medical services remotely using information and communication technologies. Telemedicine has emerged as a strategic solution to address geographical barriers, limited healthcare resources, and disparities in healthcare access across regions (Haleem et al., 2023; Kruse et al., 2023). The integration of telemedicine into healthcare systems enables patients to access medical consultations without direct physical interaction, thereby improving healthcare delivery and reducing healthcare system burdens (Koonin et al., 2023).

Globally, telemedicine adoption has increased rapidly in recent years, especially following the COVID-19 pandemic, which accelerated digital transformation in healthcare services. Many countries have integrated telemedicine into their healthcare systems to ensure continuity of care and improve access to healthcare (Bokolo, 2023; Monaghesh & Hajizadeh, 2023). Studies indicate that telemedicine can improve healthcare efficiency, reduce unnecessary hospital visits, and enhance patient monitoring, particularly for chronic disease management (Monaghesh & Hajizadeh, 2023; Shah et al., 2023). In addition, telemedicine facilitates collaboration among healthcare professionals and enables the delivery of healthcare services to remote or underserved populations (Doraiswamy et al., 2021). In developing countries, telemedicine plays an important role in addressing healthcare access inequalities caused by the uneven distribution of healthcare facilities and medical personnel. Digital health services can bridge healthcare gaps by enabling patients in remote areas to consult healthcare providers without traveling long distances (De Guzman et al., 2023; Scott Kruse et al., 2023). However, despite its potential benefits,

telemedicine implementation in many developing countries remains limited due to technological infrastructure constraints, low digital literacy, and a lack of public awareness regarding digital health services (Iyengar et al., 2023; Mishra et al., 2024). In Indonesia, improving healthcare access remains a key priority of national health development policies. The government has implemented the National Health Insurance (Jaminan Kesehatan Nasional/JKN) program to ensure equitable access to healthcare services for all citizens. Along with the expansion of the JKN program, digital health innovations such as telemedicine have been introduced to improve healthcare delivery and service efficiency (Kemenkes RI, 2023). Telemedicine services in Indonesia are integrated into digital platforms, such as the Mobile JKN application, which enables patients to communicate with healthcare providers and access services remotely.

Telemedicine has the potential to improve healthcare service quality by enhancing patient access to medical consultation, reducing waiting time, and increasing healthcare system efficiency (Shiferaw & Zolfo, 2023). Several studies have demonstrated that telemedicine can improve patient satisfaction and service quality when supported by reliable digital systems and effective communication among healthcare providers (Almathami et al., 2023; Bitar & Alismail, 2023). In addition, telemedicine services can help healthcare providers deliver continuous care and improve patient engagement in healthcare management (Rodriguez et al., 2023). The quality of healthcare services is an important indicator of healthcare system performance and patient satisfaction. Healthcare service quality is commonly evaluated through dimensions such as reliability, responsiveness, assurance, empathy, and tangibility (Mosadeghrad, 2023). In digital healthcare services such as telemedicine, additional factors, including system usability, interface design, interaction quality, and information accuracy, play crucial roles in determining service quality and patient satisfaction (Alharbi et al., 2023; Zhang et al., 2023).

Research on telemedicine adoption highlights several factors that influence patient acceptance of digital health services. Perceived usefulness, ease of use, trust in digital platforms, and system reliability are among the most important determinants of telemedicine utilization (Alghamdi et al., 2023; Venkatesh et al., 2023). Furthermore, technological infrastructure, internet accessibility, and digital literacy significantly affect the implementation of telemedicine in healthcare systems (Nittari et al., 2023). Despite the potential advantages of telemedicine, several barriers still hinder its widespread adoption. These barriers include limited digital literacy among patients, unfamiliarity with telemedicine platforms, privacy concerns, and inadequate healthcare provider training in digital consultation practices (Albahri et al., 2023; Bashshur et al., 2024). Moreover, healthcare providers must adapt their communication strategies when delivering telemedicine services, as virtual consultations require different interaction approaches compared to traditional face-to-face consultations (Greenhalgh et al., 2023).

In Indonesia, adoption of telemedicine services among JKN participants remains relatively low, particularly at the primary healthcare level. Several studies indicate that many patients remain unfamiliar with telemedicine services and prefer conventional face-to-face consultations due to limited understanding of digital health technology (Nugroho et al., 2024; Suryanto et al., 2023). In addition, insufficient public awareness and limited socialization of telemedicine services contribute to the low utilization of digital health services among JKN participants (Rahman et al., 2024). At the Flamingo Clinic in Medan, telemedicine services have been introduced through the Mobile JKN application to improve healthcare accessibility for JKN patients. However, the utilization of telemedicine services at this healthcare facility remains relatively limited. Preliminary data indicate that although many patients are registered as JKN participants at the clinic, only a small number use telemedicine services. This condition suggests that factors such as patient awareness, perceived usefulness, system usability, and service quality may influence telemedicine utilization. Therefore, further investigation is necessary to understand the relationship between telemedicine usage and healthcare service quality among JKN patients at this healthcare facility.

Based on these considerations, this study aims to analyze the relationship between telemedicine utilization and healthcare service quality among JKN patients at FKTP Flamingo Clinic, Lanud Soewondo. Specifically, the study examines several factors related to telemedicine services, including perceived usefulness, ease of use, interface quality, interaction quality, and system reliability, and their relationship with healthcare service quality. The theoretical contribution of this study lies in expanding the understanding of telemedicine adoption in primary healthcare settings within the context of the Indonesian National Health Insurance system. This research also contributes to digital health literature by identifying factors influencing telemedicine utilization and their impact on healthcare service quality. From a practical perspective, the findings of this study provide valuable insights for healthcare providers and policymakers to optimize telemedicine implementation and improve digital healthcare services.

The research results indicate that patient demographic characteristics such as age, gender, and occupation do not significantly influence patient satisfaction with telemedicine services. However, factors related to telemedicine

system performance—including perceived usefulness, ease of use, interface quality, interaction quality, and reliability—show significant relationships with patient satisfaction and healthcare service quality. These findings highlight that technological usability and service interaction quality are crucial in shaping patients' perceptions of telemedicine services. The implications of this study suggest that healthcare institutions should strengthen telemedicine implementation by improving digital infrastructure, enhancing healthcare providers' competencies in telemedicine consultations, and increasing public awareness of digital healthcare services. Healthcare facilities are also encouraged to conduct continuous socialization and digital health education programs to improve patient understanding and acceptance of telemedicine services. Strengthening collaboration between healthcare providers, government institutions, and technology developers will further support the development of sustainable telemedicine services and improve healthcare accessibility and quality in Indonesia.

METHOD

This study used a quantitative, cross-sectional research design to examine the relationship between telemedicine utilization and the quality of healthcare services among JKN patients. The cross-sectional design was chosen because it allows researchers to observe relationships between variables at a particular point in time by collecting data simultaneously from respondents. The research was conducted at the Primary Healthcare Facility (FKTP) Flamingo Clinic, Lanud Soewondo, Medan, from March to December 2025. The location was selected because the clinic has implemented telemedicine services integrated with the Mobile JKN application for patients participating in the National Health Insurance (JKN) program. The target population of this study consisted of all JKN patients who used telemedicine services at FKTP Flamingo Clinic, Lanud Soewondo, during the research period. The research sample included all patients who met the inclusion criteria and had used telemedicine services through the Mobile JKN application. Sampling was conducted using a total sampling technique in which all eligible respondents were included as research participants. The inclusion criteria included patients registered as JKN participants at the clinic, patients who had used telemedicine services, and patients willing to participate in the research.

The materials and tools used in this study consisted of a structured questionnaire developed to measure telemedicine service utilization and healthcare service quality. The questionnaire included several sections covering respondent characteristics and perceptions regarding telemedicine services. The questionnaire items were designed based on telemedicine indicators, including perceived usefulness, ease of use, interface quality, interaction quality, and reliability, as well as indicators of healthcare service quality perceived by patients. The research instrument was designed using a Likert scale to measure respondents' perceptions of telemedicine services. Respondents were asked to rate their experience with telemedicine services on a scale from strongly disagree to agree strongly. Prior to data collection, the research instrument underwent validity and reliability testing to ensure that the questionnaire items accurately measured the intended variables and produced consistent results.

Data collection was conducted using both online and offline methods. Online data collection was conducted via Google Forms to accommodate respondents who preferred digital access, while offline questionnaires were distributed directly to respondents visiting the clinic. This dual method was implemented to increase the response rate and ensure that all telemedicine users could participate in the study. The questionnaire data were analyzed using statistical methods. Univariate analysis was used to describe the distribution of respondent characteristics and each research variable. The results of the univariate analysis were presented as frequency distributions and percentages. Bivariate analysis was conducted using the Chi-square test to examine the relationship between independent variables and the quality of healthcare services among telemedicine users. The independent variables analyzed included age, gender, occupation, frequency of application use, perceived usefulness, ease of use, interface quality, interaction quality, and reliability. Multivariate analysis was performed using multiple linear regression analysis to determine the most influential factors affecting healthcare service quality among telemedicine users. In addition, the t-test was used to evaluate the significance of each independent variable individually. In contrast, the F-test was used to determine the simultaneous influence of all independent variables on the dependent variable. Statistical analysis was conducted at the $p < 0.05$ significance level to determine whether the relationship between variables was statistically significant.

RESULTS AND DISCUSSION

This study involved JKN patients who used telemedicine services at FKTP Flamingo Clinic, Lanud Soewondo, Medan. Respondents were analyzed based on age, gender, occupation, and frequency of telemedicine use.

Characteristics of Respondents

Most respondents were in the productive age group, indicating that individuals who are more familiar with digital technology tend to utilize telemedicine services. Female respondents slightly outnumbered male respondents, suggesting that women may be more likely to seek healthcare services. In terms of occupation, respondents had diverse employment backgrounds, including homemakers, private employees, civil servants, and unemployed individuals. The frequency of telemedicine use varied among respondents, though most reported using it only a few times. This indicates that telemedicine services are still relatively new and not yet fully utilized among JKN participants at the clinic.

Table 1. Frequency Distribution Characteristics of Respondents

Variabel	Quantity (n)	Percentage %
Age (Years)		
16-25 Years Old	13	15.5
26-40 Years Old	30	35.7
>40 Years Old	41	48.8
Total	84	100.0
Gender		
Male	39	46.4
Female	45	53.6
Total	84	100.0
Job		
Not Working	13	15.5
Housewives	14	16.7
Civil Servants	46	54.8
Private	11	13.1
Total	84	100.0
Frequency of Use Application		
1 time	13	15.5
2 to 5 times	40	47.6
6 to 10 times	21	25.0
>10 times	10	11.9
Total	84	100.0
Uses of Telemedicine		
Effective	81	96.4
Ineffective	3	3.6
Total	84	100.0
Convenience of Telemedicine		
Effective	81	96.4
Ineffective	3	3.6

Total	84	100.0
Quality Interface Telemedicine		
Effective	79	94.0
Ineffective	5	6.0
Total	84	100.0
Quality of Interaction Telemedicine		
Effective	78	92.9
Ineffective	6	7.1
Total	84	100.0
Telemedicine Can Be Used Reliably		
Effective	77	91.7
Ineffective	7	8.3
Total	84	100.0

Relationship between Respondent Characteristics and Healthcare Service Quality

The results of the Chi-square analysis showed that respondent characteristics, including age (p = 0.614), gender (p = 0.636), occupation (p = 0.190), and frequency of telemedicine use (p = 0.467), were not significantly associated with healthcare service quality. These findings indicate that demographic characteristics do not significantly influence patients' perceptions of healthcare service quality in telemedicine services.

Table 2. T Test Results

Variabel	T	Sig.
Age	-0.626	0.533
Gender	0.823	0.413
Jobs	0.207	0.836
Frekuensi Menggunakan	1.289	0.201
Uses	3.305	0.001
Facilities	-1.411	0.163
Quality of Interface	3.841	0.000
Quality of Interaction	-0.312	0.756
Reliability	2.590	0.012

Table 3. Test F Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.181	9	0.131	28.388	0.000b
Residual	0.342	74	0.005		
Total	1.523	83			

Table 4. Multiple Regression Equations

Variabel	**Koefisien Regresi**
Constant	0.644
Age	-0.15
Gender	0.020
Jobs	0.005
Frequency of Use	0.042
Uses	0.299
Facilities	-0.139
Quality of Interface	0.422
Quality of Interaction	-0.27
Reliability	0.268

In contrast, several telemedicine-related factors showed significant relationships with healthcare service quality. Perceived usefulness ($p = 0.01$), ease of use ($p = 0.05$), interface quality ($p = 0.01$), interaction quality ($p = 0.01$), and reliability ($p = 0.01$) were significantly associated with patient satisfaction and healthcare service quality. These results indicate that technological usability and service interaction play important roles in determining patient perceptions of telemedicine services. The findings indicate that telemedicine service quality is influenced more by system performance than by demographic factors. Patients who perceive telemedicine as useful, easy to use, and reliable tend to report higher satisfaction. Interface quality and effective communication between patients and healthcare providers also contribute to positive patient experiences. In addition, system reliability plays an important role in building patient trust in telemedicine services. Therefore, improving system usability and strengthening communication during telemedicine consultations are essential to enhance healthcare service quality and increase telemedicine utilization among JKN patients.

CONCLUSION

This study aimed to analyze the relationship between telemedicine utilization and the quality of healthcare services among JKN patients at FKTP Flamingo Clinic, Lanud Soewondo. The findings show that demographic characteristics, including age, gender, occupation, and frequency of telemedicine use, were not significantly associated with healthcare service quality. However, several telemedicine-related factors, including perceived usefulness, ease of use, interface quality, interaction quality, and system reliability, were significantly related to patient satisfaction and healthcare service quality. These results indicate that the effectiveness of telemedicine services is strongly influenced by system usability and the quality of interaction between patients and healthcare providers. Telemedicine services that are easy to use, reliable, and supported by effective communication can improve patient satisfaction and perceived quality of healthcare services. For future implementation, healthcare facilities are encouraged to improve telemedicine system performance, enhance communication during telemedicine consultations, and increase public awareness regarding digital healthcare services. Strengthening these aspects is expected to optimize the use of telemedicine services and support the development of accessible, efficient healthcare services for JKN participants.

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