

The Role of Patient Satisfaction, Technology Usability, and Healthcare Accessibility in Telemedicine Adoption: A Correlational Study

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Abstract. Telemedicine has transformed healthcare delivery, improving patient satisfaction, technology usability, and accessibility. However, gaps remain in understanding patient perspectives on adoption. Most studies emphasize technological and clinical outcomes, with limited focus on how satisfaction, usability, and accessibility interact. Additionally, research on these factors in underserved regions like the Davao Region, where healthcare disparities persist, is scarce. This study investigates the factors influencing telemedicine adoption among patients, specifically focusing on patient satisfaction, technology usability, and healthcare accessibility. Utilizing a quantitative descriptive-correlational design, data were collected from 300 telemedicine users in the Davao Region through validated questionnaires. The analysis revealed significant correlations between telemedicine adoption and the examined variables, with healthcare accessibility exhibiting the strongest correlation (0.820), followed by technology usability (0.749) and patient satisfaction (0.678). Key factors impacting patient satisfaction included the quality of care, perceived similarity to face-to-face interactions, and positive perceptions of healthcare-provider interactions. Furthermore, usability factors such as ease of use, reliability, and interface quality were critical in driving engagement. The findings underscore the importance of enhancing patient satisfaction, improving technology usability, and ensuring healthcare accessibility to facilitate telemedicine adoption. Recommendations include investing in user-friendly platforms, improving service availability and affordability, and increasing awareness among potential users. By addressing these factors, stakeholders can enhance telemedicine's role in healthcare delivery, ultimately improving patient outcomes and access to medical services, particularly in underserved areas.

Keywords: Descriptive-correlation; Healthcare accessibility; Patient satisfaction; Technology usability; Telemedicine adoption

1.0 Introduction

The rapid advancement of technology has transformed the healthcare industry, with telemedicine emerging as a pivotal innovation in improving patient care delivery. Telemedicine, defined as the use of electronic

communication technologies to provide and support healthcare services remotely, has transitioned from simple phone consultations to sophisticated platforms that enable real-time interaction between patients and healthcare providers (Shirzadfar & Lotfi, 2017; Jagarapu & Savani, 2021). These advancements have addressed the growing demand for accessible healthcare, particularly in underserved and rural areas, while also demonstrating the potential for reducing costs and enhancing the quality of care delivery (Flodgren et al., 2015; Bashshur et al., 2020).

Numerous studies highlight the benefits of telemedicine, including its capacity to improve health outcomes, such as better management of chronic conditions and reduced hospitalization rates, particularly in specialized fields like pediatrics, neonatology, and mental health (McSwain et al., 2017; Monaghesh & Hajizadeh, 2020). Additionally, telemedicine consistently garners high satisfaction levels among patients and healthcare professionals, with factors like ease of use, interaction quality, and service accessibility identified as key determinants of positive experiences (Nguyen et al., 2020; Eldaly et al., 2022). These findings underscore telemedicine's potential to revolutionize healthcare delivery systems by making services more efficient, patient-centered, and inclusive.

However, gaps persist in understanding the full scope of telemedicine adoption, particularly from the patient's perspective. Existing literature primarily focuses on technological and clinical outcomes, with limited attention to the interplay of patient satisfaction, technology usability, and healthcare accessibility as determinants of telemedicine adoption (Kruse et al., 2017). Furthermore, while theoretical models have been proposed to explain telemedicine adoption, these models often lack an integrated approach that holistically examines how these factors interact to influence patients' decisions to adopt telemedicine services (Ahmad et al., 2019). To address these gaps, this study explores the relationships between patient satisfaction, technology usability, and healthcare accessibility in telemedicine adoption. By focusing on the patient experience, the study provides a nuanced understanding of how these factors contribute to telemedicine adoption, offering actionable insights for healthcare providers and policymakers to enhance telemedicine's impact and accessibility globally.

2.0 Methodology

2.1 Research Design

The research design for this study is quantitative, utilizing a descriptive-correlational approach. This method examines the relationships between patient satisfaction, technology usability, and healthcare accessibility without manipulating variables. By focusing on these variables, the descriptive-correlational design aims to provide insights into how they comprehensively influence telemedicine adoption.

2.2 Research Participants

The study's sampling procedure focuses on individuals aged 20 and above in the Davao Region who have used telemedicine services. A two-step approach was utilized: quota sampling to estimate the total population across five provinces and stratified random sampling to select participants. Quota sampling divided the population based on location, estimating the number of telemedicine users, while stratified random sampling ensured representation from various subgroups. The final sample size of 300 was calculated using Raosoft with a 5% margin of error and 95% confidence level, distributed proportionally across the provinces.

2.3 Research Instrument

The study utilized four adapted questionnaires to assess various aspects of telemedicine: the Telemedicine Satisfaction Questionnaire, the Technology Usability Scale, the Healthcare Accessibility Scale, and the Telemedicine Adoption Scale. The Telemedicine Satisfaction Questionnaire, adapted from Yip et al. (2023), consists of 16 items and has a Cronbach's alpha of 0.925, measuring quality of care, similarity to face-to-face encounters, and perceptions of interaction using a 5-point Likert scale to gauge patient satisfaction. The Technology Usability Scale, based on Parmanto et al. (2016), evaluates usability with six indicators – usefulness, ease of use, interface quality, interaction quality, reliability, and future use – and has a Cronbach's alpha of 0.914, indicating high reliability. The Healthcare Accessibility Scale, adapted from the Perceived Access to Health Care Questionnaire by Hoseini-Esfidarjani et al. (2021), includes 30 items with a Cronbach's alpha of 0.918, focusing on access and affordability, also utilizing a 5-point Likert scale. Lastly, the Telemedicine Adoption Scale, based on Okrah (2021), measures the intention to adopt telemedicine through eight indicators, including effort expectancy

and social influence, with a high-reliability score of 0.928. All instruments consistently use a 5-point Likert scale to quantify responses, ensuring robust data collection for the study.

2.4 Data Gathering Procedure

The data gathering procedure for this study was systematically designed to collect high-quality information reflecting the experiences and perceptions of telemedicine users in Region 11, Philippines. It began with validating a comprehensive questionnaire measuring key variables: technology usability, healthcare accessibility, patient satisfaction, and telemedicine adoption. The questionnaire underwent a pilot study, confirming its reliability with high Cronbach's alpha values across various dimensions. Ethical approval was secured from the dean of the College of Nursing and the Liceo Research Ethics Board to protect participants' rights and welfare.

Recruitment involved stratified random sampling, targeting individuals who had used telemedicine services within the past year. Collaborations with healthcare providers and outreach through social media facilitated participant identification. Informed consent was obtained, and participants were assured of confidentiality and their right to withdraw from the study at any time. The electronic questionnaire was distributed via Google Forms to enhance accessibility, with technical support provided to assist participants as needed. After data collection, responses were compiled and checked for completeness and accuracy, preparing the dataset for detailed analysis using appropriate statistical techniques. Strict confidentiality and data security protocols were maintained throughout the process to protect participant information, ensuring reliable and valid findings that contribute meaningful insights into telemedicine adoption in Region 11.

2.5 Ethical Considerations

The study adhered to strict ethical standards outlined by the Liceo de Cagayan Research Ethics Board, ensuring a thorough evaluation of various factors such as inclusion and exclusion criteria, privacy, and data protection. Participants included adults aged 20 and above from Region 11 who had used telemedicine services within the past year. At the same time, those under 20, non-residents, or without internet access were excluded to maintain focus and relevance. The study lasted approximately one month, involving questionnaire completion and possible follow-ups, with strict measures in place to ensure the privacy and confidentiality of participant data, which was stored securely and anonymized. Transparency was prioritized through clear communication of study goals and regular updates, while any potential conflicts of interest were disclosed and managed. Participants were recruited through stratified random sampling, with efforts made to ensure informed consent and community engagement through collaborations with healthcare providers and telemedicine platforms. The study emphasized participant safety, communicated research benefits, and provided small non-monetary incentives. Finally, findings will be shared with stakeholders through presentations and publications, ensuring that the results contribute to improving telemedicine practices.

3.0 Results and Discussion

Table 1 summarizes the level of patient satisfaction in telemedicine, specifically focusing on three key aspects: the quality of care provided, the similarity to a face-to-face encounter, and the perception of the interaction. The mean score for the quality of care provided was 4.41, with a standard deviation of 0.618, indicating that patients were generally satisfied with the care they received through telemedicine. Regarding how similar the experience was to a traditional face-to-face encounter, the mean score was slightly lower at 4.26, with a standard deviation of 0.712. However, it still falls within the “Satisfied” range.

Table 1. Summary of level of patient satisfaction in telemedicine

Indicators	Mean	Std. Dev	Interpretation
Quality of Care Provided	4.41	0.618	Satisfied
Similarity to a face-to-face encounter	4.26	0.712	Satisfied
Perception of the interaction	4.50	0.596	Satisfied
Overall Mean	4.39	0.596	Satisfied

The highest level of satisfaction was observed in patient's perception of their interaction with healthcare providers, where the mean score reached 4.50 with a standard deviation of 0.596. The overall mean across all three categories was calculated to be 4.39, with an overall standard deviation of 0.596, consistently reflecting a general satisfaction with telemedicine services. These findings align with previous research on telemedicine conducted by Bashshur

et al. (2016), which found that patient satisfaction with telemedicine encounters highlights the importance of the quality of care delivered remotely. Their findings indicated that patients valued aspects such as effective communication, personalized attention, and thoroughness of assessments, all contributing to overall satisfaction with telemedicine services. Literature has also shown that while telemedicine is well-received, there is often a slight decrease in satisfaction when comparing the experience with traditional face-to-face consultations due to perceived limitations in physical interaction and examination (Fleischhacker, 2020). Replicating the familiar aspects of in-person care to enhance patient satisfaction with telemedicine services (Gondal et al., 2022). Nonetheless, the high ratings across these categories underscore telemedicine's growing acceptance as a viable alternative for healthcare delivery, supported by patient satisfaction metrics across different healthcare environments.

The results in Table 2 highlight the overall usability of technology in telemedicine, as measured across several dimensions. The mean score for "Usefulness" is 4.50, with a standard deviation of 0.569, indicating that respondents found telemedicine highly usable in terms of its usefulness. The dimensions of "Ease of Use and Learnability" and "Interface Quality" scored mean values of 4.44 and 4.39, respectively, with standard deviations of 0.584 and 0.564, both described as usable. Similarly, "Interaction Quality" and "Reliability" both had mean scores of 4.39 and 4.37, with slightly higher standard deviations of 0.605 and 0.620, respectively, yet still within the "usable" category. "Satisfaction and Future Use" recorded a mean of 4.41 and a standard deviation of 0.576, reflecting a generally positive sentiment toward the continued use of telemedicine. The overall mean score for the usability of telemedicine is 4.42, with a standard deviation of 0.529, falling squarely in the "usable" category, demonstrating that respondents find telemedicine technology to be functional and satisfactory. Based on the provided legend, all aspects of telemedicine usability measured fall within the "usable" range (3.51-4.50), with none reaching the "highly usable" classification (4.51-5.0).

Table 2. Summary of the level of technology usability of telemedicine

Indicators	Mean	Std. Dev	Interpretation
Usefulness	4.50	0.569	Usable
Ease of Use and Learnability	4.44	0.584	Usable
Interface Quality	4.39	0.564	Usable
Interaction Quality	4.39	0.605	Usable
Reliability	4.3	0.620	Usable
Satisfaction and Future Use	4.41	0.576	Usable
Overall Mean	4.42	0.529	Satisfied

These findings echo current research that emphasizes the importance of communication in telemedicine. Literature suggests that patients' confidence in telemedicine is largely driven by the importance of user-friendly design and intuitive navigation in enhancing patient engagement and satisfaction (Macis et al., 2019). Studies by Haleem et al. (2011) explored the usefulness of telemedicine for managing chronic conditions, highlighting its potential to enhance patient self-management, facilitate timely interventions, and improve health outcomes.

Moreover, Vista and Tamondong-Lachica (2023) compared the characteristics of patients opting for telemedicine consultations versus in-person visits in a Philippine public hospital setting. Their research identified younger, single, or employed individuals as more likely to use telemedicine. Satisfaction with telemedicine was generally high, attributed to its convenience and the perceived quality of care. The findings suggest that telemedicine has the potential to be a permanent component of the healthcare system in the Philippines, provided that issues related to access and equity are addressed (Del Castillo et al., 2022). As telemedicine platforms continue to evolve, enhancing communication tools and ensuring that virtual interactions feel as natural as in-person consultations will likely contribute to even higher satisfaction levels in the future.

Table 3 summarizes healthcare accessibility in telemedicine across six dimensions: availability, accessibility, affordability, accommodation, acceptability, and awareness. The results show that all dimensions are rated as "accessible," with mean scores ranging from 4.23 to 4.43. Specifically, the highest-rated dimension is awareness, with a mean of 4.43 and a standard deviation of 0.611, suggesting that patients are well-informed about telemedicine services. Acceptability follows closely with a mean score of 4.38 (SD = 0.583), indicating that users accept telemedicine well. Accessibility, accommodation, and availability also scored highly, with mean values of 4.37, 4.34, and 4.26, respectively, demonstrating that telemedicine services are easily reachable and available to

patients. Affordability, while still rated as accessible, has the lowest mean of 4.23 (SD = 0.636), suggesting that cost might be a relatively more significant concern than other factors. The overall mean of 4.33 (SD = 0.538) categorizes telemedicine as accessible, based on the criteria outlined in the study, with all factors contributing positively to healthcare accessibility.

Table 3. *Summary of level of healthcare accessibility in telemedicine*

Indicators	Mean	Std. Dev	Interpretation
Availability	4.26	0.609	Accessible
Accessibility	4.37	0.598	Accessible
Affordability	4.23	0.636	Accessible
Accommodation	4.34	0.599	Accessible
Acceptability	4.38	0.583	Accessible
Awareness	4.43	0.611	Accessible
Overall Mean	4.33	0.538	Accessible

These findings align with previous literature that suggests telemedicine is a viable option for improving healthcare access, particularly in underserved and remote areas (Smith & Jones, 2021). However, cost concerns, as reflected in the affordability dimension, are consistent with other studies highlighting that while telemedicine offers convenience, financial barriers may still limit its full accessibility to certain populations (Lee et al., 2020). Additionally, findings by Valencia-Arias et al. (2024) suggest that telemedicine interventions contribute to bridging gaps in healthcare access, especially in areas where traditional healthcare infrastructure is lacking. Moreover, a study by Anawade et al. (2024) underscores how telemedicine enhances healthcare accessibility by providing timely and convenient access to medical consultations, particularly for individuals facing mobility challenges or residing in areas with limited healthcare facilities. These studies collectively emphasize the transformative potential of telemedicine in improving healthcare accessibility and addressing disparities in healthcare delivery. Therefore, these results support the growing body of research advocating for expanding telemedicine to enhance healthcare accessibility while also underscoring the need to address affordability to ensure equity in healthcare delivery.

Table 4 provides a comprehensive summary of telemedicine adoption among patients, highlighting various factors influencing this adoption. The data reveals that most of the assessed factors fall within the "Adoptable" range, with performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, and price value all showing means above 4.0. Specifically, performance expectancy has a mean score of 4.35 (SD = 0.580), effort expectancy is at 4.38 (SD = 0.569), social influence is 4.30 (SD = 0.583), facilitating conditions is 4.32 (SD = 0.581), hedonic motivation is 4.28 (SD = 0.523), and price value stands at 4.27 (SD = 0.594). These factors are rated as "Adoptable," indicating a positive disposition toward telemedicine based on these aspects.

Table 4. *Summary of level of telemedicine adoption among patients*

Indicators	Mean	Std. Dev	Interpretation
Performance Expectancy	4.35	0.580	Adoptable
Effort Expectancy	4.38	0.569	Adoptable
Social Influence	4.30	0.583	Adoptable
Facilitating Conditions	4.32	0.581	Adoptable
Hedonic Motivation	4.28	0.523	Adoptable
Price Value	4.27	0.594	Adoptable
Habit	4.10	0.696	Adoptable
Privacy and Security Concerns	3.43	0.757	Moderately Adoptable
Overall Mean	4.12	0.472	Adoptable

Although slightly lower, Habit falls within the "Adoptable" category with a mean of 4.10 (SD = 0.696). Conversely, privacy and security concerns are rated as "Moderately Adoptable," with a mean score of 3.43 (SD = 0.757), suggesting that these concerns may influence adoption to a moderate extent. The overall mean score for telemedicine adoption is 4.12 (SD = 0.472), reinforcing the general trend of positive adoption among patients. These findings align with the literature on telemedicine adoption, which underscores the importance of performance expectancy, effort expectancy, and social influence in facilitating technology acceptance (Davis et al., 2020; Venkatesh et al., 2012). Moreover, the moderate concern over privacy and security mirrors the concerns

identified in various studies, highlighting the need for robust security measures to enhance user confidence (Kruse et al., 2017).

Moreover, recent studies have emphasized the role of additional factors such as hedonic motivation, price value, habit, and privacy and security concerns in shaping individuals' decisions to adopt telemedicine (Lu et al., 2024; Davis et al., 2020; Hoque & Sorwar, 2017). These factors collectively contribute to the complex landscape of telemedicine adoption, reflecting the interplay between technological capabilities, user perceptions, social influences, and organizational contexts. Furthermore, research has highlighted the importance of addressing barriers to adoption, such as limited access to technology, data security and privacy concerns, and resistance to change among healthcare providers (Abdelhamid et al., 2017; Camara et al., 2015). Overall, the literature underscores the need for a comprehensive understanding of the factors influencing telemedicine adoption to inform policy, practice, and technology development efforts to promote the widespread adoption of remote healthcare services. These insights will be further explored in the subsequent literature review, which will explore how these factors influence telemedicine adoption and the implications for future research and practice.

The correlation analysis presented in Table 5 illustrates significant relationships between telemedicine adoption and three key variables: patient satisfaction, technology usability, and healthcare accessibility, each crucial for the successful implementation of telemedicine. There is a strong positive correlation (0.678) between patient satisfaction and telemedicine adoption, indicating that higher satisfaction levels—driven by the quality of care (0.611), the similarity to face-to-face encounters (0.602), and positive interactions with healthcare providers (0.683)—lead to an increased likelihood of adopting telemedicine. This finding aligns with prior studies that emphasize the importance of patient satisfaction in enhancing telemedicine uptake, particularly regarding convenience and access to care (Bashshur et al., 2016; Kruse et al., 2017).

Table 5. Correlation analysis for the relationships between telemedicine adoption and three key variables: patient satisfaction, technology usability, and healthcare accessibility

Variables	Correlation Coefficient	p-value	Interpretation
Patient Satisfaction	.678**	.000	Significant
Quality of care provided	.611**	.000	Significant
Similarity to face-to-face encounter	.602**	.000	Significant
Perception of the interaction	.683**	.000	Significant
Technology Usability	.749**	.000	Significant
Usefulness	.718**	.000	Significant
Ease of use and learnability	.677**	.000	Significant
Interface Quality	.657**	.000	Significant
Interaction Quality	.674**	.000	Significant
Reliability	.645**	.000	Significant
Satisfaction and Future Use	.690**	.000	Significant
Healthcare Accessibility	.820**	.000	Significant
Availability	.724**	.000	Significant
Accessibility	.735**	.000	Significant
Affordability	.687**	.000	Significant
Accommodation	.703**	.000	Significant
Acceptability	.789**	.000	Significant
Awareness	.730**	.000	Significant

**Correlation is significant at the 0.05 level (2-tailed).

Additionally, technology usability shows a high correlation (0.749) with telemedicine adoption, with factors such as usefulness (0.718), ease of use (0.677), interface quality (0.657), and reliability (0.645) contributing to patients' willingness to engage with telemedicine. Previous studies reinforce the idea that user-friendly systems enhance adoption by reducing barriers to engagement (Wade et al., 2019; Pierre, 2024). Improved technology usability encourages patient satisfaction and future use, making it essential to design telemedicine platforms. Moreover, the strongest correlation (0.820) is observed between healthcare accessibility and telemedicine adoption, encompassing availability (0.724), affordability (0.687), accommodation (0.703), acceptability (0.789), and awareness (0.730). These factors are vital for patients to utilize telemedicine services, particularly in underserved areas, as highlighted by studies emphasizing telemedicine's role in improving access to care and reducing travel burdens (Leelavati et al., 2023; Almalki et al., 2023). These findings suggest that enhancing patient satisfaction, ensuring technology usability, and improving healthcare accessibility are key strategies for increasing

telemedicine adoption. Addressing these aspects can support the broader acceptance and integration of telemedicine within healthcare systems, aligning with existing literature on the importance of user experiences and accessibility in successfully implementing telemedicine services.

4.0 Conclusion

The correlation analysis reveals significant relationships between telemedicine adoption and three critical factors: patient satisfaction, technology usability, and healthcare accessibility. A strong positive correlation exists between patient satisfaction and telemedicine adoption, indicating that higher satisfaction levels – driven by quality of care, the similarity of telemedicine to face-to-face interactions, and positive perceptions of healthcare provider interactions – lead to increased adoption rates. Additionally, technology usability is strongly correlated with telemedicine adoption, suggesting that user-friendly systems significantly enhance patient engagement. Furthermore, healthcare accessibility shows the strongest correlation with telemedicine adoption, emphasizing the importance of availability, affordability, accommodation, acceptability, and awareness in encouraging patients to utilize telemedicine services.

To foster greater telemedicine adoption, healthcare providers and policymakers should enhance patient satisfaction by improving the quality of care through effective communication and patient engagement techniques while regularly soliciting feedback for improvements. Additionally, investing in user-friendly telemedicine platforms that prioritize ease of use and reliability is crucial. Strategies to improve the availability and affordability of telemedicine services, particularly in underserved areas, should also be implemented, along with targeted outreach campaigns to raise awareness of these services. Addressing potential concerns and misconceptions about telemedicine is essential for promoting its acceptability. By focusing on these areas, stakeholders can ensure that telemedicine becomes more integral to the healthcare delivery system, ultimately improving patient outcomes and access to care.

5.0 Contributions of Authors

Main Author: As the principal investigator and main author, he conceptualized the study, designed the methodology, collected and analyzed the data, and drafted the manuscript. He also revised the manuscript based on peer-review feedback.

Co-author: As the adviser and co-author, she provided guidance and critical input in the study's conception and design. She reviewed and revised the manuscript, ensuring intellectual rigor and alignment with academic standards.

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7.0 Conflict of Interests

All authors declared that they have no conflicts of interest as far as this study is concerned.

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