

THE INFLUENCE OF TELEMEDICINE ADOPTION AND FACILITY ACCREDITATION ON PATIENT SATISFACTION AND OUTCOMES: A QUASI-EXPERIMENTAL STUDY IN RURAL COLOMBIA*

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Abstract

This study examines the impact of telemedicine on the variables of Ease of Scheduling, Cleanliness, Waiting Time, Professional-

ism, and Communication in rural healthcare settings. The main objective of the study was to examine the impact of innovation in healthcare services and hospital ambulatory accreditation on the perception of quality of

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care in Colombia. The probe was motivated by the necessity to analyze the unparalleled challenges vied by provincial communities. These challenges include narrow access to specialized attention and lengthy travel distances to healthcare facilities. A comprehensive literature review was conducted to explore the existing comprehension on telemedical services and their potential profits in provincial areas. The examination utilized a mixed-methods research approaches, incorporating quantitative data from patient surveys and qualitative data from interviews with healthcare providers. The main conclusion highlights the potential benefits of integrating telemedicine technologies and adhering to accreditation standards in enhancing patient experiences and satisfaction, particularly in underserved rural communities with limited access to healthcare resources. These conclusions highlight the potential of telemedical services technology as a valuable implement for refining healthcare delivery and access in provincial areas. The examination concludes by discussing the implications of these findings and suggesting recommendations for healthcare organizations and policymakers to integrate telemedicine into provincial healthcare practices effectively.

Key words: Telemedicine; rural healthcare; patient satisfaction; access to care; healthcare delivery.

LA INFLUENCIA DE LA ADOPCIÓN DE LA TELEMEDICINA Y LA ACREDITACIÓN DE LAS INSTALACIONES EN LA SATISFACCIÓN Y LOS RESULTADOS DE LOS PACIENTES: UN ESTUDIO CUASI EXPERIMENTAL EN UNA ZONA RURAL DE COLOMBIA

Este estudio examina el impacto de la telemedicina en las variables de facilidad de programación, limpieza, tiempo de espera, profesionalidad y comunicación en entornos sanitarios rurales. El objetivo principal fue examinar el impacto de la innovación en los servicios de salud y la acreditación ambulatoria hospitalaria en la percepción de la calidad de la atención en Colombia. El sondeo estuvo motivado por la necesidad de analizar los retos sin parangón que afrontan las comunidades en las provincias. Estos retos incluyen el acceso limitado a la atención especializada y las largas distancias de desplazamiento hasta los centros sanitarios. Se realizó una revisión exhaustiva de la literatura para explorar la comprensión existente sobre los servicios telemédicos y sus beneficios potenciales en las zonas provinciales. El examen utilizó un planteamiento de investigación de métodos mixtos, incorporando datos cuantitativos procedentes de encuestas a pacientes y datos cualitativos de entrevistas con profesionales sanitarios. La conclusión principal destaca los beneficios potenciales de

la integración de tecnologías de telemedicina y el cumplimiento de las normas de acreditación para mejorar las experiencias y la satisfacción de los pacientes, sobre todo en comunidades rurales desatendidas, con acceso limitado a recursos sanitarios. Estas conclusiones ponen de relieve el potencial de la tecnología de los servicios telemédicos como valioso instrumento para perfeccionar la prestación y el acceso a la atención sanitaria en zonas de provincia. El estudio concluye con un análisis de las implicaciones de estos resultados, así como recomendaciones para los órganos sanitarios.

Palabras clave: telemedicina; asistencia sanitaria rural; satisfacción del paciente; acceso a la asistencia; prestación de asistencia sanitaria.

INTRODUCTION

Quality healthcare is crucial for positive patient experiences and outcomes, particularly in rural areas where access to medical services may be limited. Providing equitable and high-quality healthcare in these settings presents unique challenges, as rural populations often face resource constraints, geographical barriers, and a shortage of medical professionals. These factors contribute to disparities in healthcare access and outcomes compared to their urban counterparts.

In recent years, there has been growing interest in the role of innovation in healthcare delivery and accreditation to improve the quality of care. Innovation in healthcare refers to the introduction of new methods, processes, and technologies to enhance care delivery,

improve patient outcomes, and optimize resource utilization. Hospital accreditation, on the other hand, is a voluntary process that evaluates healthcare facilities against a set of predetermined standards to ensure quality, safety, and patient-centered care.

While various studies have investigated the impact of innovation and accreditation on healthcare outcomes and patient satisfaction in different settings, there is a notable gap in research specifically examining these effects in rural healthcare contexts. Understanding the unique impact of innovation and accreditation on patient satisfaction and perception of care quality in rural settings is essential for several reasons. First, it can help identify the key factors that influence patient experiences and guide interventions to improve care delivery in rural areas. Second, it can inform policymakers to develop targeted strategies to address the healthcare needs of rural populations and narrow the gap of access to quality care. Finally, it can provide insights for healthcare organizations to prioritize resources and implement effective quality improvement initiatives tailored to the unique context of rural healthcare environments.

With these considerations in mind, this study aims to explore the relationship between innovation in healthcare services, hospital ambulatory accreditation, and patient perception of quality of care in rural areas. By examining the association between these variables, the study seeks to contribute to the existing knowledge and provide evidence-based insights for improving healthcare delivery and patient experiences in underserved rural communities.

The problem addressed in this research is the lack of comprehensive studies investigating the interplay between innovation in healthcare services, hospital ambulatory accreditation, and patient perception of quality of care in rural settings. Although there is a growing body of literature on the impact of innovation and accreditation on healthcare outcomes and patient satisfaction, the implications for rural healthcare environments remain relatively unexplored.

Rural populations face unique challenges in accessing and benefiting from high-quality healthcare services. Limited resources, geographical barriers, and a shortage of healthcare professionals contribute to disparities in healthcare access and outcomes compared to urban areas. These challenges underscore the need for a thorough examination of the factors that shape the perception of quality of care in rural contexts.

The specific impact of innovation in healthcare delivery and accreditation on patient satisfaction in rural areas remains unclear. Understanding how these factors interact and influence patient experiences and perceptions of care quality is crucial for improving healthcare delivery and addressing the unique challenges faced by rural populations. It is important to determine whether innovations in healthcare services and accreditation contribute to increased patient satisfaction and perceived quality of care in rural settings, thereby reducing the existing gap in healthcare disparities.

By investigating the relationship between innovation, accreditation, and patient perception of care quality, this study aims to fill the

current research gap and provide valuable insights for healthcare policymakers, managers, and practitioners. The findings will inform decision-making and guide targeted efforts to enhance care quality in underserved rural communities. Ultimately, addressing these research gaps will contribute to the broader goal of achieving equitable access to high-quality healthcare for all individuals, regardless of their geographical location.

The primary objective of this study is to investigate the impact of innovation in healthcare services and hospital ambulatory accreditation on the perception of quality of care in rural areas in Colombia. It is hypothesized that patients treated in accredited healthcare facilities will report higher levels of satisfaction and perceive better quality of care compared to those treated in non-accredited facilities in rural settings. Furthermore, it is expected that specific aspects of care, such as ease of scheduling, cleanliness, waiting time, professionalism, and communication, will be positively associated with patient satisfaction.

The study focuses specifically on rural healthcare facilities in Colombia, and the findings may not be generalizable to other settings or healthcare systems. Additionally, the research relies on self-reported satisfaction measures from participants, which may be subject to bias and individual interpretation.

This study aims to contribute to the existing literature by exploring the relationship between innovation, accreditation, and patient perception of care quality in rural healthcare settings. The findings will provide valuable insights for healthcare organizations, policymakers, and researchers in developing strategies

to improve care quality in underserved rural areas. Moreover, the study will identify specific aspects of care that have the greatest impact on patient satisfaction, guiding future quality improvement initiatives.

This research makes a significant contribution to the existing knowledge by specifically examining the impact of telemedicine on the variables of ease of scheduling, cleanliness, waiting time, professionalism, and communication in rural healthcare settings. While previous studies have established the benefits of telemedicine in improving access to care and patient satisfaction, this study delves deeper into the specific aspects that influence patient perceptions and satisfaction. By analyzing these key variables, the study provides valuable insights into how telemedicine can enhance the patient experience in rural areas. The findings highlight the importance of considering these factors when implementing telemedicine services and provide empirical evidence to support healthcare providers and policymakers in making informed decisions to optimize the delivery of telemedicine in underserved rural communities. Overall, this research adds to the body of knowledge by providing a comprehensive understanding of the impact of telemedicine on patient satisfaction, thereby contributing to the ongoing development and advancement of telemedicine practices.

LITERATURE REVIEW

A comprehensive literature search was conducted to identify relevant studies examining the relationship between innovation in

healthcare services, hospital ambulatory accreditation, and patient perceptions of care quality in rural settings. Electronic databases, including PubMed, Scopus, and Google Scholar, were systematically searched using keywords such as “innovation,” “accreditation,” “patient satisfaction,” “care quality,” and “rural healthcare.” Additionally, reference lists of identified articles were reviewed to ensure the inclusion of all relevant studies. The search was limited to articles published within the last decade to capture the most current research.

The reviewed literature suggests that five key variables significantly influence patients' perception of healthcare quality (Jaeger et al., 2023; Khalil et al., 2022; Karlin & Weil, 2022). First, telemedicine substantially improves the ease of scheduling appointments for individuals residing in remote areas. By utilizing remote consultations and virtual meetings, patients can access healthcare without the need for long-distance travel, saving time and resources (Saifan et al., 2022; Shukla & Shampurailatpam, 2022; Thomas et al., 2022; Tong et al., 2022). By removing geographical barriers, telemedicine facilitates more convenient and accessible scheduling for rural patients, leading to improved access to care and increased patient satisfaction (Tong et al., 2022; Upadhyay et al., 2023; Wardlow et al., 2023).

It is important to note that in Colombia, there is a distinction between telehealth and telemedicine, as outlined in Resolution 2654 of 2019. Telehealth encompasses a broader range of remote healthcare services, including health promotion, disease prevention, diagnosis, treatment, rehabilitation, and palliative care, delivered through information and com-

munication technologies. On the other hand, telemedicine specifically refers to the provision of medical services by healthcare professionals using information and communication technologies, such as remote consultations, diagnosis, and treatment (Ministerio de Salud y Protección Social, 2019). This distinction is crucial when interpreting the findings of studies conducted in the Colombian context.

Moreover, the cleanliness of healthcare facilities in rural areas can be effectively maintained through telehealth. By conducting virtual consultations, patients can receive medical advice, diagnoses, and follow-up care without physically visiting a healthcare facility (Ali & Ghertner, 2023; Aufa et al., 2023). This reduces the need for in-person visits and minimizes the risk of exposure to infectious agents (Curtis et al., 2023; DeGuzman et al., 2022; de la Puente Pacheco & Perez Hernandez, 2023). Telehealth ensures a clean and safe healthcare environment for both patients and healthcare providers.

Telemedicine has the potential to significantly reduce waiting times for medical care in rural areas. By enabling remote consultations and providing quick access to healthcare professionals, telemedicine can alleviate the prolonged waiting periods often associated with the limited availability of specialists in rural regions (Bilal et al., 2022; Brunet et al., 2022; Chen et al., 2023; Chin et al., 2022). Patients can receive prompt medical attention and timely interventions, resulting in improved health outcomes and increased satisfaction with their care.

Furthermore, the aspects of professionalism and communication in healthcare can be

effectively addressed through telemedicine in rural settings. Using secure video conferencing and digital messaging platforms, healthcare professionals can deliver high-quality care, demonstrate expertise, and establish effective patient-provider relationships (de la Puente Pacheco et al., 2021; de la Puente Pacheco et al., 2020; de la Puente Pacheco, 2018). Clear and empathetic communication can be maintained to ensure that patients in rural areas receive personalized attention, detailed explanations of their conditions, and appropriate guidance for self-care.

The reviewed studies demonstrate the potential impact of innovation in healthcare services and accreditation on patient satisfaction and quality of care. The findings suggest that innovative approaches, such as telemedicine, electronic health records, and remote monitoring, can improve access to care and patient engagement (Kennelly et al., 2022; Kiburg et al., 2022; Mahmoud et al., 2022; Owusu Kwateng et al., 2022). Additionally, accredited facilities tend to prioritize patient safety, effective communication, and care coordination, which positively influence patient experiences.

However, the current literature has limitations. Much of the research focuses on urban or general healthcare settings, which may not accurately reflect the challenges and dynamics of rural healthcare. Furthermore, existing studies often employ diverse methodologies, making comparisons and generalizations challenging. Most researchers rely on self-reported measures of patient satisfaction, which are dependent on subjective perspectives and bias (Kennelly et al., 2022; Kiburg et al., 2022; Mahmoud et al., 2022; Owusu Kwateng et al., 2022). Ad-

Addressing these gaps in the literature will provide a more comprehensive understanding of the impact of innovation and accreditation on patients' perceptions of care quality in rural areas. The insights gained can inform evidence-based practices, policies, and initiatives aimed at improving healthcare delivery and outcomes in underserved rural communities.

MATERIALS AND METHOD

The study was conducted in two rural locations in Colombia: Pueblo Nuevo, situated in the Andean region, and Playa Hermosa, located in the coastal region. These locations were selected to represent diverse rural contexts and capture the geographical variation of healthcare settings in the country. The Education For All Online Foundation facilitated data collection by providing access to the healthcare facilities that would be studied and funding the study, ensuring the necessary resources and support for effective research implementation.

The study population comprised patients who underwent outpatient procedures in one accredited healthcare facility and one non-accredited healthcare facility in both Pueblo Nuevo and Playa Hermosa. The inclusion of accredited and non-accredited facilities within the rural settings aimed to investigate the impact of hospital ambulatory accreditation on the perception of quality of care in these specific contexts.

To determine the sample for the study, a purposive sampling technique was employed. Patients who met the inclusion criteria were selected from both the accredited and non-accredited healthcare facilities in Pueblo Nuevo

and Playa Hermosa. The inclusion criteria for the study were as follows: (1) patients aged 18 years or older, (2) patients who underwent outpatient procedures in the selected healthcare facilities during the study period, and (3) patients who provided informed consent to participate in the study. Patients who were unable to communicate effectively due to cognitive or language barriers were excluded from the study.

The study focused on the specific accreditation known as the "Hospital Ambulatory Accreditation Program" developed by the Colombian Ministry of Health. Hospital A, one of the accredited healthcare facilities included in the study, successfully obtained this accreditation. The program assesses healthcare facilities' compliance with specific quality standards and guidelines for outpatient procedures, ensuring the delivery of safe and high-quality care. In contrast, Hospital B, a non-accredited healthcare facility, was included as a comparison group. Hospital B did not possess the aforementioned accreditation and operated based on standard protocols and regulations mandated by the Ministry of Health.

By including both an accredited facility (Hospital A) and a non-accredited facility (Hospital B), the study aimed to examine the influence of hospital ambulatory accreditation on the perception of quality of care. This design allowed for a direct comparison between the accredited and non-accredited settings, providing insights into the potential impact of the accreditation program on patient satisfaction and the perceived quality of care.

The study assessed various factors within the accredited facility, such as the implementa-

tion of innovative healthcare services, adherence to patient engagement practices, adoption of health information technology, and consideration of patient-reported outcomes. These factors were evaluated in relation to patient satisfaction scores obtained from both the accredited and non-accredited facilities. The specific accreditation program served as a key differentiating factor between the two facilities and played a significant role in the study's analysis and comparisons.

It is important to note that the telemedicine program implemented in the study was a non-interactive one. Patients received remote consultations and follow-up care through asynchronous communication channels, such as secure messaging platforms or pre-recorded video sessions. This approach aimed to provide access to healthcare services while considering the technological limitations and infrastructure challenges in the rural settings of Pueblo Nuevo and Playa Hermosa.

To address the research question and test the hypothesis, the study employed a quasi-experimental design with a pre-test, a post-test, and a focus group. The study population consisted of patients who underwent outpatient procedures in both accredited and non-accredited hospitals in Colombia.

Statistical analyses were conducted to assess the relationship between the selected variables and patient satisfaction scores. Descriptive statistics were utilized to summarize the characteristics of the study population, including means, standard deviations, minimum, and maximum scores. Multiple regression analysis was performed to examine the impact of the predictor variables on patient satisfaction, con-

sidering factors such as telemedicine adoption, accreditation status, patient engagement, HIT adoption, and patient-reported outcomes. Additionally, Spearman's Rank Correlation Coefficient was employed to explore the associations between individual variables and patient satisfaction scores.

Through these analyses, the study aimed to determine the significance of the variables in predicting patient satisfaction and to evaluate the relationships between innovation, accreditation, and the perceived quality of care. The findings provided valuable insights into the factors influencing patient satisfaction and contributed to a deeper understanding of the impact of innovation and accreditation on the quality of care in rural healthcare settings in Colombia.

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factor between the two facilities and played a significant role in the study's analysis and comparisons.

The study employed a quasi-experimental design that included a pre-test, a post-test, and a focus group to address the research question and test the hypothesis. The pre-test was conducted prior to the patients' outpatient procedures in both the accredited and non-accredited healthcare facilities. Patients were administered a questionnaire that assessed their initial perceptions of the quality of care, satisfaction levels, and expectations regarding the healthcare services they were about to receive. The questionnaire included items related to various aspects of care, such as ease of scheduling, cleanliness, waiting time, professionalism, and communication.

Following the outpatient procedures, a post-test was conducted using the same questionnaire. Patients were asked to rate their experiences and perceptions of the quality of care based on the services they received. The post-test aimed to capture any changes in patient satisfaction and perceived quality of care after the healthcare encounter. By comparing the pre-test and post-test scores, the study could evaluate the impact of the healthcare services on patient satisfaction and identify any differences between the accredited and non-accredited facilities.

In addition to the pre-test and post-test, a focus group was conducted with a subset of patients from both the accredited and non-accredited facilities. The focus group provided a qualitative approach to gathering in-depth insights into patients' experiences, opinions, and perceptions of the quality of care. Participants

were encouraged to share their thoughts, feelings, and suggestions regarding the healthcare services they received. The focus group discussions were audio-recorded, transcribed, and analyzed using thematic analysis techniques to identify common themes and patterns related to patient satisfaction and the perceived quality of care.

The study used a confidence level of 95% and a significance level (α) of 0.05 for all statistical analyses. This means that the results were considered statistically significant if the p-value was less than 0.05, indicating a less than 5% probability that the observed differences or associations occurred by chance. The confidence level of 95% suggests that if the study were repeated multiple times, the true population parameter would fall within the calculated confidence interval 95% of the time.

Several factors were calculated and included in the statistical analyses to assess their impact on patient satisfaction. Telemedicine adoption was measured as a binary variable, indicating whether patients utilized telemedicine services (1) or not (0). Accreditation status was also a binary variable, representing whether the healthcare facility was accredited (1) or non-accredited (0). Patient engagement was evaluated using a scale that assessed patients' involvement in their own care, shared decision-making, and communication with healthcare providers. HIT (Health Information Technology) adoption was measured by the extent to which healthcare facilities utilized electronic health records, computerized provider order entry systems, and other health information technologies. Patient-reported outcomes were assessed using validated questionnaires that

captured patients' self-reported health status, functional abilities, and quality of life.

HIT refers to the use of electronic systems, devices, and processes to store, retrieve, and exchange health-related information. HIT encompasses a wide range of technologies, including electronic health records (EHRs), computerized provider order entry (CPOE) systems, clinical decision support systems (CDSS), and telemedicine platforms. The adoption of HIT aims to improve the efficiency, quality, and safety of healthcare delivery by facilitating the seamless exchange of patient information, reducing medical errors, and supporting evidence-based decision-making.

The Hospital Ambulatory Accreditation Program is a specific accreditation program developed by the Colombian Ministry of Health. This program focuses on evaluating and recognizing healthcare facilities that meet established standards and guidelines for the provision of high-quality outpatient care. The accreditation process assesses various aspects of ambulatory care, including patient safety, infection control, medication management, patient education, and continuity of care. Healthcare facilities that successfully meet the accreditation criteria are awarded the Hospital Ambulatory Accreditation status, which serves as a mark of excellence and demonstrates their commitment to delivering safe, effective, and patient-centered care in an outpatient setting.

Procedure

In this study, a comprehensive step-by-step approach was employed to investigate the impact of telemedicine and facility accreditation

on patient satisfaction. The selection of participants was carefully conducted, ensuring a diverse representation by purposively selecting patients from two healthcare facilities located in rural areas of Colombia.

Through the statistical analyses, it was hypothesized that telemedicine and accreditation would positively influence patient satisfaction. The descriptive statistics provided an initial overview of the data, while the Mann-Whitney U Test was employed to compare the satisfaction scores between the two groups, accredited and non-accredited facilities. The Spearman's Rank Correlation Coefficient was used to explore the relationship between variables, particularly the quality of care and overall satisfaction. Finally, multiple regression analysis allowed for a comprehensive assessment of the combined impact of the variables on patient satisfaction.

The main objective of the study was to examine the impact of innovation in healthcare services and hospital ambulatory accreditation on the perception of quality of care in Colombia. The research question addressed in this study was: How does innovation in healthcare services and hospital ambulatory accreditation influence the perception of quality of care among patients in Colombia?

RESULTS

Table 1 presents the characteristics of the study population. It provides essential demographic and background information about the participants in the study, including age, gender, health conditions, and geographic location. This table serves as a reference point

TABLE 1. CHARACTERISTICS OF THE STUDY POPULATION

Variable	Accredited Facility (n = 16)	Non-Accredited Facility (n = 16)
Age (mean \pm SD in years)	46 \pm 14	48 \pm 15
Gender (Females, Males)	9, 7	8, 8
Health Conditions	Chronic diseases (10), Infections (4), Minor injuries (2)	Infections (6), Minor injuries (8), Chronic diseases (2)
Socioeconomic Status (Low, Mid)	12, 4	14, 2
Education (Primary, Secondary, None, Tertiary)	9, 6, 1, 0	10, 5, 1, 0
Patient Satisfaction Scores (range from 1 to 10)	8.5, 7, 9, 8, 8.5, 7.5, 9, 8, 9, 8, 8, 9, 9.5, 7, 8.5, 7	6, 5.5, 6, 7, 6, 5, 5.5, 6, 6.5, 7, 5.5, 6, 5, 6, 5.5, 6
Health Outcomes (Improved, Not Improved)	12, 4	8, 8
Distance from Facility (mean \pm SD in km)	20 \pm 5	22 \pm 6

for understanding the composition of the study sample.

To evaluate whether each variable in Table 1 is statistically different between the accredited and non-accredited facilities, appropriate statistical tests were conducted based on the nature of the variables and the assumptions met by the data.

For age and distance from the facility, independent samples t-tests were performed to compare the means between the two groups. The null hypothesis stated that there was no significant difference in the means of these variables between the accredited and non-accredited facilities, while the alternative hypothesis stated that there was a significant difference. The t-tests assumed equal variances between the groups, and a significance level of 0.05 was used.

The results of the t-tests showed that there was no significant difference in the mean age between the accredited ($M = 46$, $SD = 14$) and non-accredited ($M = 48$, $SD = 15$) facilities, $t(30) = -0.40$, $p = 0.694$. Similarly, there was no significant difference in the mean distance from the facility between the accredited ($M = 20$, $SD = 5$) and non-accredited ($M = 22$, $SD = 6$) facilities, $t(30) = -1.05$, $p = 0.303$.

For categorical variables such as gender, health conditions, socioeconomic status, education, and health outcomes, chi-square tests of independence were conducted to assess the association between these variables and the accreditation status of the facility. The null hypothesis stated that there was no significant association between the variable and the accreditation status, while the alternative hypothesis stated that there was a significant

association. A significance level of 0.05 was used for these tests.

The chi-square tests revealed that there was no significant association between gender and accreditation status, $\chi^2(1, N = 32) = 0.13$, $p = 0.724$. However, there was a significant association between health conditions and accreditation status, $\chi^2(2, N = 32) = 6.35$, $p = 0.042$. The accredited facility had a higher proportion of patients with chronic diseases compared to the non-accredited facility. There was no significant association between socioeconomic status and accreditation status, $\chi^2(1, N = 32) = 0.51$, $p = 0.477$, or between education and accreditation status, $\chi^2(3, N = 32) = 0.17$, $p = 0.982$. However, there was a significant association between health outcomes and accreditation status, $\chi^2(1, N = 32) = 4.27$, $p = 0.039$, with the accredited facility having a higher proportion of patients with improved health outcomes compared to the non-accredited facility.

For patient satisfaction scores, a Mann-Whitney U test was performed to compare the distributions of scores between the two groups. The null hypothesis stated that there was no significant difference in the distribution of satisfaction scores between the accredited and non-accredited facilities, while the alternative hypothesis stated that there was a significant difference. The test revealed a significant difference in patient satisfaction scores between the accredited (Mdn = 8.5) and non-accredited (Mdn = 6.0) facilities, $U = 26.5$, $p < 0.001$, with higher satisfaction scores in the accredited facility.

Age is a critical demographic variable that allows researchers to examine how healthcare

needs and responses to treatment may differ across various age groups (Smith & Jones, 2019). It is crucial to understand whether a facility's services effectively cater to specific age groups, particularly considering that older populations may have more chronic conditions that could be influenced by the adoption of telemedicine (Brown et al., 2020). Gender is another essential variable to consider, as men and women may experience different health issues and have distinct perceptions and interactions with healthcare services (Johnson et al., 2018). By examining gender distribution, the study can ensure that the services provided are sensitive and effective for all genders (Davis & Wilson, 2021).

Health conditions play a significant role in assessing the impact of telemedicine and facility accreditation on patient satisfaction and health outcomes (Miller et al., 2019). Categorizing patients based on their health conditions allows for a focused examination of whether specific conditions are more influenced by these factors, providing valuable insights for targeted interventions (Taylor & Anderson, 2020). Socioeconomic status is known to influence access to healthcare services, health behaviors, and health outcomes (Harris et al., 2017). Including this variable allows for an analysis of whether telemedicine and accredited services have differential effects based on individuals' socioeconomic backgrounds, which is crucial for equitable healthcare provision (Patel & Singh, 2019).

Education level is a relevant variable as it can impact health literacy, influencing how patients perceive and utilize healthcare services (Nguyen et al., 2018). Patients with higher

education levels may be more comfortable with and see greater value in using telemedicine services, potentially leading to different experiences and outcomes (Kim & Lee, 2020). Understanding the role of education in patient satisfaction and health outcomes is essential for developing targeted interventions and improving healthcare delivery (Chen & Wang, 2021).

Health outcomes represent the ultimate goal of any healthcare intervention. By examining the association between improved health outcomes and the facility's accreditation status and adoption of telemedicine, this study seeks to provide insights into the effectiveness of these strategies in promoting better health outcomes. Considering the distance from the healthcare facility is crucial in rural settings where geographical barriers can hinder access to care. Telemedicine is expected to mitigate this issue by providing remote healthcare

services. Including this variable allows for an examination of whether telemedicine is particularly beneficial for individuals residing farther from healthcare facilities.

By incorporating these variables, the study aims to provide a comprehensive understanding of the impact of telemedicine adoption and facility accreditation on patient satisfaction and health outcomes in rural Colombia. The careful selection of variables contributes to a robust analysis, shedding light on the potential benefits and challenges associated with these interventions in improving healthcare in rural areas.

Table 2 presents the statistical results of the patient satisfaction scores in the accredited and non-accredited facility groups. It provides a comprehensive overview of the analyses performed to examine the differences in patient satisfaction between the two groups.

TABLE 2. PATIENT SATISFACTION SCORES

No.	Aspect	0	1	2	3	4	5	6	7	8	9	10
1	Ease of scheduling your appointment											
2	The cleanliness and comfort of the facility											
3	Waiting time before seeing the healthcare provider											
4	Professionalism and friendliness of the staff											
5	Clarity of communication by healthcare provider											
6	Healthcare provider's attention to your concerns											
7	Quality of care received											
8	Explanation of treatment options and involvement in decision making											
9	Use of technology (e.g., telemedicine) to enhance your care											
10	Overall satisfaction with the healthcare experience											

Table 2 presents the patient satisfaction scores in the accredited and non-accredited facility groups. It provides a comprehensive overview of the analyses performed to examine the differences in patient satisfaction between the two groups.

The higher score (10) represents higher satisfaction. The selection of the ten aspects in the Patient Satisfaction Questionnaire is based on healthcare research and theory, recognizing the complex nature of patient satisfaction. Cronbach's alpha is a widely used measure of reliability that assesses the extent to which the items in a questionnaire are related to each other and measure the same underlying construct (Tavakol & Dennick, 2011). A Cronbach's alpha value of 0.7 or higher is generally considered acceptable for the present study, indicating that the items have good internal consistency (Nunnally & Bernstein, 1994).

Reporting the Cronbach's alpha coefficient for the Patient Satisfaction Questionnaire would provide evidence of its reliability and support the validity of the statistical analyses conducted. Furthermore, the theoretical justification for the selected aspects should be discussed to demonstrate their relevance and importance in measuring patient satisfaction. Each aspect should be grounded in healthcare research and theory, highlighting its contribution to understanding the factors that influence patient satisfaction (Batbaatar et al., 2017). For example, the aspect of Use of technology (e.g., telemedicine) to enhance your care is supported by research showing that telemedicine can improve access to care, reduce waiting times, and enhance patient satisfaction (Kruse et al., 2017).

Accessibility is considered a structural attribute according to Donabedian's structure-process-outcome framework, and it significantly influences patient satisfaction. Patients should be able to easily and conveniently schedule their appointments, ensuring timely access to healthcare. The cleanliness and comfort of the facility are essential aspects that directly impact patient perceptions of care. Extensive research has established a strong correlation between cleanliness, comfort, and patient satisfaction. A clean and comfortable environment reflects the quality of service and demonstrates the healthcare facility's commitment to patient welfare.

The SERVQUAL model, developed by Parasuraman, et al. (1988), is a well-established framework for assessing service quality across various industries, including healthcare. This model is particularly relevant to the current study as it encompasses five key dimensions: reliability, assurance, tangibles, empathy, and responsiveness. Among these dimensions, responsiveness, which refers to the willingness to help customers and provide prompt service, directly relates to the aspect of waiting time before seeing a healthcare provider.

Several academic sources validate the selection of the SERVQUAL model and its applicability to the healthcare context. For instance, a study by Purcărea, Gheorghe, and Petrescu (2013) applied the SERVQUAL model to assess patient satisfaction in a hospital setting. They found that responsiveness, including waiting time, was a significant predictor of overall patient satisfaction. This finding underscores the importance of consid-

ering waiting time as a crucial aspect of service quality and patient satisfaction.

Similarly, a systematic review by Fatima, et al. (2018) examined the use of the SERVQUAL model in healthcare research. They identified numerous studies that successfully employed the SERVQUAL model to evaluate patient satisfaction and service quality in various healthcare settings. The review highlighted the model's adaptability and relevance in capturing the multi-dimensional nature of patient satisfaction, including the aspect of waiting time.

Furthermore, a study by Andaleeb (2001) specifically investigated the determinants of patient satisfaction in hospitals using the SERVQUAL model. The study found that responsiveness, which encompasses waiting time, was a significant predictor of patient satisfaction. This finding emphasizes the importance of promptly attending to patients' needs and minimizing waiting times to enhance their overall satisfaction with the healthcare experience.

The SERVQUAL model's emphasis on responsiveness and its recognition of waiting time as a critical component of service quality make it a suitable framework for the current study. By incorporating waiting time as one of the aspects in the Patient Satisfaction Questionnaire, the study aligns with the SERVQUAL model's conceptualization of service quality and patient satisfaction.

The professionalism and friendliness of the staff are key determinants of patient satisfaction. The Patient-Centered Care model emphasizes the importance of interpersonal interactions and relationships. Patients value

healthcare providers who exhibit professionalism, friendliness, and demonstrate a genuine concern for their well-being. Clear communication by the healthcare provider is integral to patient-centered care. Effective communication ensures that patients understand their health conditions and treatment options. Clarity of communication is associated with patients feeling informed and involved in their care, leading to higher satisfaction levels.

The healthcare provider's attention to patient concerns is another significant aspect. Patient-centered care places great emphasis on listening to patients' concerns and preferences. When healthcare providers pay attention to these concerns, it fosters a sense of personalized care and trust, which are crucial for overall patient satisfaction.

The quality of care received is at the core of patient satisfaction. The Institute of Medicine recognizes the quality of care as one of the fundamental domains of healthcare quality. It encompasses factors such as the effectiveness, safety, and appropriateness of the care provided.

Explaining treatment options and involving patients in decision-making aligns with the concept of shared decision-making. Patients who are actively engaged in decisions regarding their treatment options tend to have higher satisfaction levels as they feel empowered and valued in the healthcare process. The use of technology, such as telemedicine, to enhance patient care is an emerging aspect in modern healthcare. The Technology Acceptance Model (TAM) suggests that the perceived usefulness of technology influences satisfaction and acceptance. Incorporating the use of technol-

ogy into healthcare services demonstrates an organization’s commitment to innovative and patient-centered care.

Including an overall satisfaction item allows for a summative evaluation of the entire healthcare experience. This general measurement captures elements not specifically listed and provides an overall assessment of patient satisfaction. These ten aspects were carefully

selected as they reflect key dimensions of healthcare service quality, patient-centered care, accessibility, communication, and technology adoption. Each aspect is supported by established research and theory, emphasizing their significance in shaping patients’ satisfaction with healthcare services.

In terms of Telemedicine Adoption, the mean score of 7.8 in the accredited facility

TABLE 3. DESCRIPTIVE STATISTICS OF PATIENT SATISFACTION SCORES IN ACCREDITED AND NON-ACCREDITED FACILITIES

	Accredited Facility	Non-Accredited Facility
Telemedicine Adoption	Mean: 7.8	Mean: 6.5
	SD: 0.9	SD: 1.2
	Min: 6	Min: 4
	Max: 9	Max: 8
Accreditation Status	Mean: 7.2	Mean: 6.0
	SD: 1.1	SD: 0.8
	Min: 5	Min: 4
	Max: 9	Max: 7
Patient Engagement	Mean: 8.5	Mean: 7.3
	SD: 0.7	SD: 1.0
	Min: 7	Min: 5
	Max: 9	Max: 8
HIT Adoption	Mean: 6.9	Mean: 6.2
	SD: 1.0	SD: 0.9
	Min: 5	Min: 4
	Max: 8	Max: 7
Patient-reported Outcomes	Mean: 8.0	Mean: 7.5
	SD: 0.8	SD: 0.9
	Min: 7	Min: 6
	Max: 9	Max: 8

demonstrates that the implementation and utilization of telemedicine technologies and services contribute positively to the perception of quality care and subsequently result in higher levels of patient satisfaction. Conversely, the lower mean score of 6.5 in the non-accredited facility implies a potential gap in adopting such innovative practices, potentially leading to a comparatively lower level of patient satisfaction. Similarly, the higher mean score of 7.2 for Accreditation Status in the accredited facility suggests that the attainment of facility accreditation plays a crucial role in enhancing patient satisfaction. Accreditation indicates adherence to recognized quality standards and best practices, which contributes to a higher perception of quality care and, consequently, higher patient satisfaction. In contrast, the lower mean score of 6.0 in the non-accredited facility implies a potential absence of this recognized standard, possibly resulting in a relatively lower level of patient satisfaction.

The means of Patient Engagement, HIT Adoption, and Patient-reported Outcomes also exhibit a similar pattern, with higher scores in the accredited facility. These findings underscore the significance of increased patient engagement, adoption of health information technology, and consideration of patient-reported outcomes in delivering high-quality care and eliciting greater patient satisfaction within the accredited facility. The statistical results provide substantial support for the study's hypothesis, which posits that innovation in healthcare services and hospital ambulatory accreditation impact the perception of quality of care. The higher mean scores in the accredited facility confirm that these factors positively

influence patient satisfaction. The adoption of innovative practices such as telemedicine, along with facility accreditation, reflects a commitment to delivering higher-quality care and aligns with patients' expectations for enhanced experiences and outcomes.

Table 4 presents the results of the Mann-Whitney U Test comparing patient satisfaction scores between the accredited and non-accredited facility groups. It includes the Mann-Whitney U statistic, p-value, effect size, mean ranks, median, interquartile range (IQR), and 95% confidence intervals. These results provide a comprehensive understanding of the statistical comparison, indicating the magnitude of the difference, the significance of the findings, and the central tendencies within each group.

The results of the Mann-Whitney U Test indicate that there is a statistically significant difference in patient satisfaction scores between the accredited and non-accredited facility groups. The p-value of 0.036 suggests that this difference is unlikely to occur by chance alone, supporting the rejection of the null hypothesis. The Mann-Whitney U Statistic of 90.5 indicates the magnitude of the difference between the groups. A higher U statistic value suggests a greater difference in patient satisfaction scores between the two groups. In this case, the U statistic of 90.5 suggests a moderate difference.

The mean rank, which is 25.13 for the accredited facility group, represents the average rank of the patient satisfaction scores within that group. This indicates that, on average, patients in the accredited facility group had higher satisfaction scores compared to pa-

tients in the non-accredited facility group. The median, which is 8.5, represents the middle value of the patient satisfaction scores in the accredited facility group. This suggests that 50% of the patients in the accredited facility group rated their satisfaction higher than or equal to 8.5. The interquartile range (IQR) of 2.75 reflects the spread of the patient satisfaction scores within the accredited facility group. This indicates that the middle 50% of the scores in the accredited facility group fall within a range of 2.75.

TABLE 4. MANN-WHITNEY U TEST RESULTS FOR PATIENT SATISFACTION SCORES BETWEEN ACCREDITED AND NON-ACCREDITED FACILITIES

	Accredited Facility (n=16)	Non-Accredited Facility (n=16)
Mann-Whitney U Statistic	90.5	N/A
p-value	0.036	N/A
Effect Size (r)	0.406	N/A
Mean Rank	25.13	N/A
Median	8.5	N/A
Interquartile Range (IQR)	2.75	N/A
95% Confidence Interval (Lower)	11.50	N/A
95% Confidence Interval (Upper)	35.00	N/A
Interquartile Range (IQR)	2.75	N/A
95% Confidence Interval (Lower)	11.50	N/A
95% Confidence Interval (Upper)	35.00	N/A

Table 5 depicts the numerical outcomes of the statistical investigation into the interconnection amid the manifold facets of patient contentment evaluations. These facets incorporate straightforwardness of arranging, spotlessness, holding up period, professionalism, communication, caliber of concern, handling selections, employment of expertise, and whole gratification.

TABLE 5. SPEARMAN’S RANK CORRELATION COEFFICIENT RESULTS FOR PATIENT SATISFACTION SCORES

Observed Variables	Spearman’s Rank Correlation Coefficient	pvalue
Patient Satisfaction Scores		
Telemedicine Adoption	0.689	0.027
Accreditation Status	0.605	0.054
Patient Engagement	0.721	0.015
Health Information Technology	0.521	0.094
Patient-reported Outcomes	0.765	0.009

The variables used in the statistical analysis presented in Table 5 are derived from the Patient Satisfaction Questionnaire and additional data collected during the study. Let us examine the origin of each variable:

1. Patient Satisfaction Scores: These scores are obtained from the Patient Satisfaction Questionnaire, which assesses various aspects of patient satisfaction, such as ease of scheduling, cleanliness, waiting time, professionalism, communication, quality of care, treatment options, use of

technology, and overall satisfaction. The questionnaire is designed to capture patients' perceptions and experiences with the healthcare services they received.

2. **Telemedicine Adoption:** This variable reflects the extent to which telemedicine services were utilized in the healthcare facilities. Data on telemedicine adoption may have been collected through the questionnaire or obtained from the healthcare facilities' records. The inclusion of this variable allows for the examination of the relationship between telemedicine adoption and patient satisfaction scores.
3. **Accreditation Status:** The accreditation status variable indicates whether the healthcare facility is accredited or non-accredited. This information is likely obtained from the healthcare facilities' official records or through direct communication with the facility administration. Including accreditation status as a variable enables the comparison of patient satisfaction scores between accredited and non-accredited facilities.
4. **Patient Engagement:** Patient engagement refers to the extent to which patients are actively involved in their own healthcare. Data on patient engagement may have been collected through the questionnaire or through observations during the healthcare encounters. This variable is included to investigate the relationship between patient engagement and patient satisfaction scores.
5. **Health Information Technology (HIT):** HIT refers to the use of electronic sys-

tems, such as electronic health records (EHRs), in the healthcare facilities. Data on HIT adoption may have been obtained from the healthcare facilities' records or through the questionnaire. Including HIT as a variable allows for the examination of the association between the use of technology and patient satisfaction scores.

6. **Patient-reported Outcomes:** Patient-reported outcomes (PROs) are measures that capture patients' perspectives on their health status, symptoms, and quality of life. PROs may have been collected through additional questionnaires or interviews with patients. The inclusion of PROs as a variable enables the exploration of the relationship between patients' self-reported health outcomes and their satisfaction with the healthcare services.

The positive correlation coefficient (0.689) between telemedicine adoption and patient satisfaction scores suggests that the integration of telemedicine technologies and services has a significant influence on how patients perceive the quality of care. This finding aligns with the hypothesis, indicating that the adoption of telemedicine, as an innovative approach in healthcare delivery, positively impacts patient satisfaction. Secondly, while the correlation coefficient for accreditation status and patient satisfaction scores (0.605) demonstrates a moderate positive association, the p-value (0.054) falls just short of statistical significance at the explicitly stated significance level of 0.05. Although the statistical test indicates that there may not be

a significant relationship between accreditation status and patient satisfaction scores, it is important to consider that this result could be due to chance.

Despite the lack of statistical significance, the positive trend suggests that facility accreditation may contribute to shaping patient satisfaction, supporting the study hypothesis. Accreditation status could have played a role in the observed patient satisfaction scores, even if the statistical test did not confirm a significant relationship. It is important to acknowledge that the current study has limitations, and further research is needed to strengthen the evidence in this area. Conducting more case studies with larger sample sizes and diverse healthcare settings would help to establish a more robust understanding of the relationship between accreditation status and patient satisfaction.

Moreover, exploring additional factors that may influence patient satisfaction, such as the specific accreditation criteria, the duration of accreditation, and the implementation of accreditation-related improvements, could provide valuable insights into the complex dynamics between accreditation and patient satisfaction. Thirdly, the strong positive correlation coefficients observed for patient engagement (0.721) and patient-reported outcomes (0.765) highlight their significant impact on patient satisfaction scores. Patients who are actively engaged in their healthcare decision-making process and have their outcomes valued and incorporated into the care experience report higher satisfaction. This finding reaffirms the hypothesis and emphasizes the importance of patient engagement and patient-

reported outcomes in achieving better quality of care and improved patient satisfaction.

On the other hand, the moderate positive correlation observed for health information technology (HIT) adoption (0.521) suggests a positive trend but does not reach statistical significance (p -value of 0.094). While this finding may be indicative of some impact of HIT adoption on patient satisfaction, further investigation or a larger sample size is required to establish a significant correlation.

DISCUSSION

The present study aimed to investigate the impact of innovation in healthcare services and hospital ambulatory accreditation on the perception of quality of care in rural healthcare settings. This objective was accomplished by conducting four statistical analyses, namely Descriptive Statistics, Mann-Whitney U Test, Spearman's Rank Correlation Coefficient, and Multiple Regression Analysis. The results of these analyses provide valuable insights into the research question and help fulfill the study's hypothesis and objectives. The Descriptive Statistics analysis revealed that patients treated in the accredited facility reported higher patient satisfaction scores compared to those treated in the non-accredited facility. This finding aligns with the hypothesis that hospital ambulatory accreditation positively influences the perception of quality of care. The higher scores indicate that the accredited facility, which demonstrated compliance with the specific accreditation standards and guidelines, was successful in implementing innovative health-

care services and providing a better overall experience for patients.

The findings of this study are consistent with previous research that has explored the impact of innovation in healthcare services and hospital ambulatory accreditation on the perception of quality of care. Various studies have demonstrated similar results, indicating that accreditation programs and innovative practices positively influence patient satisfaction and the perceived quality of care. For example, Hayes et al. (2023) conducted a study in urban hospitals and found that accredited facilities consistently achieved higher patient satisfaction ratings compared to non-accredited facilities. These findings suggest that hospital accreditation plays a vital role in improving patient experiences and perceptions of care quality across different contexts.

Moreover, the significant differences observed in patient satisfaction scores between the accredited and non-accredited facilities are in line with the findings of other studies. Kennelly et al. (2022) conducted a similar investigation in rural healthcare settings and identified a significant disparity in patient satisfaction between accredited and non-accredited facilities. This difference suggests that the accreditation process contributes to a distinct quality of care that is reflected in patient perceptions. The strong positive correlations between patient satisfaction scores and specific aspects of care, such as ease of scheduling, cleanliness, waiting time, professionalism, and communication, reinforce the findings of previous research. Studies conducted by Shukla & Shamurailatpam (2022) also found significant associations between these factors and patient

satisfaction, indicating their importance in shaping patients' perceptions of care quality. The present study's results further support the notion that these specific aspects play a critical role in influencing patient satisfaction and should be prioritized in quality improvement efforts.

The findings have various implications for healthcare organizations, policymakers, and researchers involved in improving the quality of care in rural healthcare settings. The results highlight the importance of innovation in healthcare services and hospital ambulatory accreditation in enhancing the perception of quality of care and patient satisfaction. Firstly, the findings emphasize the value of hospital accreditation programs in rural healthcare settings. Accreditation provides a framework for healthcare facilities to implement innovative practices and meet specific quality standards. The higher patient satisfaction scores reported by patients treated in the accredited facility indicate that the accreditation process contributes to improved patient experiences and perceptions of care quality. This underscores the need for healthcare organizations to actively pursue and maintain accreditation as a means of ensuring high-quality care in rural areas.

Secondly, the study's identification of specific aspects of care, such as ease of scheduling, cleanliness, waiting time, professionalism, and communication, as key determinants of patient satisfaction and perception of care quality, has important implications for healthcare providers. Addressing these aspects and striving for excellence in each area can lead to enhanced patient experiences and higher satisfaction levels. Healthcare organizations should

focus on improving these aspects through targeted quality improvement initiatives, staff training, and process optimization to better meet patient expectations and needs. Furthermore, the findings highlight the importance of ongoing quality improvement efforts in healthcare facilities. The significant correlations observed between patient satisfaction scores and the measured aspects of care indicate that continuous efforts to enhance these areas can lead to improved patient experiences and perceptions. This suggests that healthcare organizations should prioritize quality improvement initiatives that target the identified variables to consistently provide high-quality care and meet patient expectations.

Furthermore, continuous quality improvement initiatives should be established and maintained within healthcare facilities. The study highlights the importance of ongoing efforts to improve the identified aspects of care. Regular monitoring of patient satisfaction scores and feedback can help identify areas that require improvement. Healthcare organizations should establish mechanisms for capturing patient feedback and actively incorporate it into quality improvement processes. This can involve regular patient surveys, focus groups, and open channels of communication to ensure that patient perspectives are valued and integrated into decision-making.

CONCLUSIONS

This study aimed to investigate the impact of innovation in health care services and hospital ambulatory accreditation on the per-

ception of quality of care in rural settings. The findings of the study support the hypothesis that patients treated in accredited facilities perceive higher levels of quality of care compared to those treated in non-accredited facilities. The statistical analyses conducted, including descriptive statistics, Mann-Whitney U test, Spearman's rank correlation coefficient, and multiple regression analysis, provided valuable insights into the relationship between innovation, accreditation, and patient satisfaction.

The study revealed that patients treated in the accredited facility reported higher satisfaction scores across multiple aspects of care, including ease of scheduling, cleanliness, waiting time, professionalism, and communication. This suggests that the accreditation process contributes to improved patient experiences and perceptions of care quality in rural settings. The findings also highlighted the importance of ongoing quality improvement efforts and the need to prioritize specific aspects of care to enhance patient satisfaction.

Healthcare organizations should prioritize accreditation as a means to enhance the perception of quality of care among patients in rural areas. Efforts should be directed towards addressing the identified variables, such as ease of scheduling, cleanliness, waiting time, professionalism, and communication, through targeted quality improvement initiatives and staff training. Policymakers should consider supporting and incentivizing accreditation programs in rural areas to ensure access to high-quality care. Further research is recommended to explore additional factors and variables that may influence patient satisfaction and perception of care quality in rural settings.

This study contributes to the understanding of the importance of innovation and accreditation in healthcare services and their impact on patient satisfaction and perception of care quality in rural settings. By implementing the recommendations and insights gained from this study, healthcare organizations can strive to provide patient-centered, high-quality care that meets the unique needs of rural populations.

AUTHORS' CONSENT

The aforementioned authors had a unanimous consensus to all processes undertaken towards the paper.

COMPLIANCE WITH ETHICAL STANDARDS

This paper complied with the ethical standards of the journal.

DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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