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E-healthcare service: perceived quality, satisfaction, and recommendation intention

E-healthcare Service: Qualidade Percebida, Satisfação e Intenção de Recomendação

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Resumo

Esta pesquisa analisa a influência que a qualidade percebida do e-health possui na satisfação e intenção de recomendação de indivíduos que fizeram uso de serviços de saúde através de teleconsulta. Com base no modelo 5Qs, foram elaboradas hipóteses de pesquisa e proposto um modelo conceitual. Para a validação desse modelo e teste de hipóteses, foi utilizado o método survey junto a 118 pacientes de diversas especialidades de teleconsulta e aplicada a técnica da Modelagem de Equações Estruturais. Os resultados evidenciam que a qualidade de processo e de objeto, isso é, a eficiência e precisão na prestação do serviço possuem maior relevância na satisfação do consumidor. Também foi evidenciado que há forte associação entre a satisfação e intenção de recomendação. Esse estudo traz contribuições importantes para a área, visto que possibilita uma melhor compreensão sobre aspectos que interferem na satisfação de um público que é criterioso com a prestação de serviço. Além disso, esse estudo pode servir de subsídio aos gestores de empresas do setor de saúde no que diz respeito ao desenvolvimento de estratégias que objetivem melhorar a prestação de serviço por meio da tecnologia.
Palavras-chave: consumidor de e-health; qualidade de serviço; modelo 5Qs.

Abstract

This research aims to analyze the influence of the perceived quality of e-health on the satisfaction and recommendation intention of individuals who have used health services through teleconsultation. Hypotheses were developed based on the 5Qs model, and a conceptual model was proposed. To validate the proposed model and test the developed hypotheses, a survey method was employed, involving 118 patients from various teleconsultation specialties. The Structural Equation Modeling technique was applied for analysis. The results indicate that the quality of both the process and the object, i.e., the efficiency and precision in the service provision, have a significant impact on consumer satisfaction. Furthermore, the findings suggest a strong correlation between satisfaction and the intention to recommend the service. This study is a significant contribution to the field as it facilitates a better understanding of the factors that impact the satisfaction of the public responsible for service provision. Moreover, this study can serve as a resource for healthcare sector managers in developing strategies aimed at improving service delivery through technology.
Keywords: e-health consumer; service quality; 5Qs model.

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1 Introduction

The global service industry has shown significant growth, as evidenced by the ten leading global brands, which are mostly service brands established by the world's top entrepreneurs (Qureshi et al., 2021). In Brazil, the service sector strongly impacted GDP growth in the second quarter of 2022, accounting for more than 50% of the economy (Brazilian Institute of Geography and Statistics – IBGE, 2022). Within this sector, healthcare stands out. According to the Economist Intelligence Unit (EIU, 2021), projected total expenditures in Brazil for 2022, 2023, and 2024 are R$ 889.2, R$ 934.9, and R$ 980.3 billion, respectively, equivalent to about 10% of the country's GDP.

Despite this prominence, healthcare providers face a continuous need to improve their practices. In this sector, particular attention to service quality is essential, as it involves solving sensitive consumer problems. Even minor service errors may cause a long-term negative impression on patients (Nguyen & Nagase, 2019; Altaf et al., 2018).

To meet individuals' demand for safe and high-quality healthcare services, it is necessary to pursue technological innovations that align with client needs (Lorenzetti et al., 2016; Amankwah et al., 2022). Technology has driven improvements as society experiences the Fourth Industrial Revolution, which advances at an exponential pace and is marked by developments in robotics, artificial intelligence, and the Internet of Things (Ul Hassan et al., 2020).

The use of technology in healthcare services has shaped an area commonly known as e-health services (Ami-Narh & Williams, 2012; Lewis et al., 2012; Guo et al., 2023). The World Health Organization (WHO) has defined e-health as the safe and cost-effective use of Information and Communication Technology (ICT) for health and related fields (Alanezi, 2021). Furthermore, WHO stated that there is a global commitment to developing and implementing e-health technologies for disease detection, prevention, and treatment, as well as for promoting health and well-being (World Health Organization [WHO], 2020). This may contribute to higher-quality service delivery, which in turn enhances patient satisfaction.

User satisfaction is considered a fundamental goal of healthcare services and has become increasingly important when evaluating service quality (Ribeiro, 2017; Deji-Dada et al., 2021). When clients are satisfied with the care received, they are more likely to return and to recommend the service to others (Medeiros, 2018; Verma et al., 2020).

In this context, Gumus and Sonmez (2018) investigated the quality of online hospital services and their effects on consumer preferences. They mapped the 100 most frequently cited hospitals and found that online services offered by hospitals are highly valued by healthcare consumers. A positive correlation was identified between users' hospital ratings and hospitals' evaluated scores. These findings imply that hospitals' online services may significantly influence consumers' hospital preferences.

Subsequently, Verma et al. (2020) sought to identify the key quality predictors of consumer satisfaction with e-health services. They found that the quality of interaction with both the hospital environment and service objects are the main predictors of consumer satisfaction with e-health. This research highlights the importance of quality aspects in ensuring patient satisfaction with the services provided.

Therefore, given that business competitiveness requires enterprises to continuously pursue innovative knowledge that improves service delivery in order to grow and maintain market leadership (Ferreira et al., 2018), this study aims to analyze the influence of perceived e-health quality on individuals' satisfaction and their recommendation intention regarding

teleconsultation-based healthcare services. In this sense, by examining quality perceptions, this study will enable e-health service providers to design more effective strategies to enhance patient satisfaction and loyalty.

To achieve this objective, the study is divided into four sections beyond this introduction. The next section presents the literature review and the arguments supporting the proposed hypotheses. Section 3 describes the methodology. Section 4 presents the results and discussion, and finally, Section 5 provides the conclusions.

2 Theoretical framework

In this section, the topics that form the theoretical framework are described, namely service-dominant logic, e-health services, quality dimensions, research hypotheses, and the conceptual model. All of these elements provide the foundation for this study and support the methodological procedures and analyses conducted.

2.1 Service-Dominant Logic

Services represent economic activities that are consumed as they are produced and provide added value, being essentially intangible, that is, the outcome of delivery is not a construction or physical product (Zeithaml & Bitner, 2003; Barrios et al., 2023). In contrast, products have a tangible physical nature, which means that customers purchase the services that products perform for them rather than the product itself (Vargo & Morgan, 2005; Tadajewski & Jones, 2021).

From this perspective, the service-dominant logic emerges, in which the product is viewed as a mechanism that enables service delivery (Lusch & Vargo, 2006). The service is seen as something that ensures the product's functionality, and at times the product may merely serve as the provider of the service (Brambilla & Damacena, 2011). Based on service-dominant logic, it is understood that regardless of the business activity, what is delivered is ultimately a service. In this scenario, Zeithaml et al. (1995) emphasize that delivering quality service is critical to achieving success and surviving in a competitive environment (Chen et al., 2024).

Parasuraman et al. (1988) defined service quality as an organization's ability to meet or exceed customer expectations. Later, Bitner and Hubbert (1994) linked service quality to the general perception customers hold regarding an organization's relative inferiority or superiority in service delivery. Thus, to improve service quality, it must first be measured, and such metrics provide comparisons that justify organizational changes aimed at achieving customer/patient satisfaction (Zineldin & Vasicheva, 2012; Amankwah et al., 2022). Therefore, it is crucial for companies to measure this aspect in order to assess consumer perceptions of the services they offer.

The first measure of service quality was proposed by Grönroos (1984) through the Nordic model. Grönroos identified two dimensions: the first, technical quality, which reflects the service outcome; and the second, functional quality, which refers to the process of evaluating how the service is delivered.

Later, Parasuraman et al. (1988) refined this measurement and developed the SERVQUAL scale, which assesses service quality across five core dimensions: reliability, tangibility, responsiveness, empathy, and assurance. However, the application of this scale has been debated in different fields by authors such as Jauch and Orwig (1997), who highlighted the challenges of measuring healthcare service quality indicators using SERVQUAL.

Building on this, Zineldin (2006) further expanded the Nordic model and SERVQUAL by developing five new quality dimensions (5Qs), popularly known as the 5Qs model. According to Zineldin, this model is relevant across all healthcare contexts, whether hospitals or private clinics, where patients, physicians, nurses, and other health professionals interact interchangeably.

Consequently, a specific scale for measuring service quality in healthcare has emerged. This model is highly relevant since healthcare service quality plays a fundamental role in patient satisfaction and represents one of the most significant stages in quality improvement (Izadi et al., 2017; Verma et al., 2022).

In the healthcare sector, the rise of global competition has made patients more demanding and concerned about the delivery of healthcare services (Fatima et al., 2018; Guo et al., 2022). This means that by offering superior quality in healthcare services compared to their peers, organizations have the opportunity to stand out in competitive markets (Karatepe et al., 2005; Verma et al., 2020). Therefore, healthcare professionals must continually strive to improve the execution of their activities.

2.2 E-health services and quality dimensions

The incorporation of technology into healthcare is viewed positively, as it can improve service delivery and the diagnosis of pathologies, leading to better care, increased life expectancy, and other benefits (Paschoalin Filho et al., 2024; Simangolwa et al., 2024; Gomes & Dalcol, 1999). According to these authors, technology has become such a positive constant that it is virtually impossible to consider developments in healthcare without associating them with evolution and technology.

For better application of e-health, the Fifty-eighth World Health Assembly, in 2005, adopted Resolution WHA58.28, which established WHO's e-health strategy (World Health Organization, 2023). According to WHO (2023), the resolution emphasizes the urgency for Member States to plan appropriate e-health services in their countries. Also in 2005, WHO launched the Global Observatory for e-health (GOe), an initiative dedicated to studying e-health, highlighting its development and impact on national health systems (WHO, 2023).

In Brazil, telemedicine was first regulated from an ethical perspective in 2002, through Resolution No. 1.643/2002 of the Federal Council of Medicine (CFM). This resolution authorized physicians issuing remote medical reports to provide diagnostic and therapeutic support in emergencies or when requested by the attending physician (Resolução nº 1.643/2002, 2002).

Previously, the Brazilian Code of Medical Ethics had been regulated by Resolution No. 1,246/1988. That resolution prohibited prescribing treatments or procedures without a direct patient examination, except in urgent cases or when the impossibility of conducting an in-person exam was proven. In such cases, a direct examination had to be performed as soon as the impediment no longer existed (Resolução nº 1.246/1988, 1988).

After Resolution No. 1,643/2002, attempts were made to regulate telemedicine in greater detail through Resolution No. 2,227/2018. However, it was revoked due to the large number of recommended changes. With the outbreak of the Covid-19 pandemic, the CFM and the Ministry of Health authorized telemedicine as a temporary and emergency practice. The legislative branch published Law No. 13.989/2020, which reinforced this temporary authorization for the duration of the coronavirus crisis (Lei nº 13.989/2020, 2020).

As debates intensified during the Covid-19 pandemic, the CFM defined and regulated telemedicine as a form of medical services mediated by communication technologies, through Resolution No. 2.314/2022, which is currently in effect. According to Article 5 of this resolution, telemedicine may be practiced in the following modalities of medical telecare: teleconsultation, teleinterconsultation, telediagnosis, telesurgery, telemonitoring or telesurveillance, teletriage, and teleconsulting (Resolução nº 2.314/2022, 2022).

In the Brazilian context, Serrano et al. (2022) investigated the factors influencing the acceptance of telemedicine among adults in the country. The study found that adults tend to accept telemedicine regardless of its degree of complexity. Furthermore, the findings contributed to the debate on telemedicine in Brazil, showing no barriers to patient acceptance of telemedicine services. Nevertheless, there remains a need to understand and monitor how service quality affects patient satisfaction, since in healthcare, service quality is essential for ensuring satisfaction.

In this regard, it is relevant to identify the quality dimensions used in e-health. Zineldin (2006) defined five quality dimensions: quality of object, quality of process, quality of infrastructure, quality of interaction, and quality of atmosphere. The 5Qs model, developed by this author, is suitable for assessing e-health services and has already been applied, for example, in the studies of Verma et al. (2020) and Verma et al. (2022). This model has been well accepted in healthcare, as it was specifically designed to measure consumers' opinions about healthcare organizations (Gohain et al., 2018). The present study also employed this model. Based on the literature review, the research hypotheses and the conceptual model to be adopted were defined and are presented in the next section.

2.3 Research hypotheses and conceptual model

The 5Qs model evaluates service quality across five dimensions. For the present study, the dimensions assessed were quality of object, quality of process, quality of infrastructure, and quality of interaction. Quality of object refers to the accuracy with which the service is provided and defines the primary reason why consumers choose certain services. This first "Q" measures the sense of well-being and the ability to deliver services appropriately. In this regard, quality of object is understood as a potential driver of patient satisfaction. Thus, the first hypothesis was formulated:

H1 – Quality of object is positively related to patient satisfaction.

According to Ferreira (2012), perceived quality represents the consumer's judgment of the quality and excellence of the service provided. This perception is of great importance in healthcare, since healthcare service quality plays a crucial role in patient satisfaction (Izadi et al., 2017). For this reason, this study suggests that quality of process, which indicates the functional quality of how healthcare professionals deliver services and demonstrate their practical applications, is related to patient satisfaction. Based on this reasoning, the following hypothesis was defined:

H2 – Quality of process is positively related to patient satisfaction.

Naidu (2009) concluded that patient satisfaction is a multidimensional construct and that both patient satisfaction and service quality are essential to improving healthcare services and hospital image. Later, Lewis et al. (2012) identified that for successful technological

implementation in this sector, greater support for the adoption of new technologies and better methods for assessing impact are required. Shabbir et al. (2016) demonstrated the positive association between service quality and patient satisfaction. Accordingly, quality of infrastructure, which corresponds to the types of resources and personnel made available for service delivery, is positively related to consumer satisfaction. In e-health services, the digital platforms provided are evaluated and may influence the consumer's consultation experience. Therefore, the following hypothesis is proposed:

H3 – Quality of Infrastructure is positively related to patient satisfaction.

Quality of interaction refers to the methods adopted and the time spent in communication between patients and healthcare professionals. A friendly attitude by the hospital staff may be positively associated with patient satisfaction. Satisfaction reflects the evaluation made by the client regarding the product or service, the care provided, and whether their needs and expectations were met (Zeithaml, 2003). If these points are not addressed, dissatisfaction occurs. Consumption satisfaction may influence the decision to repurchase a product and/or service, while dissatisfaction may lead to a change in behavior, with the client seeking alternative brands or deciding not to use that product or service again (Lobuono et al., 2016). Based on this, the following hypothesis was formulated:

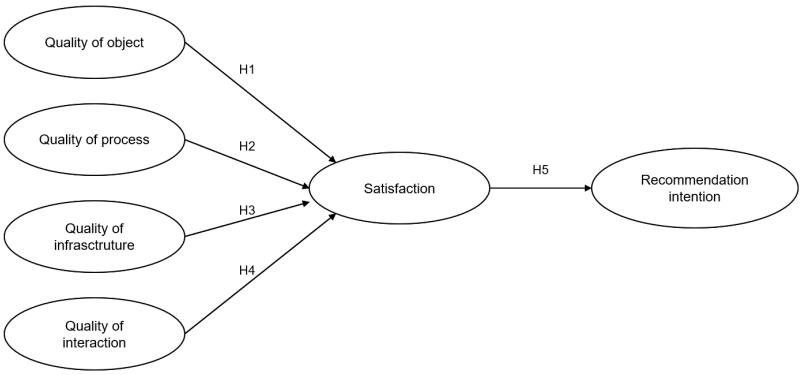
H4 – Quality of interaction is positively related to patient satisfaction.

Zeithaml et al. (2000) state that a satisfied consumer is more likely to return to a healthcare organization and bring in other patients through positive word-of-mouth recommendations. Boisvert and Sajid Khan (2023) hypothesized that satisfaction with the service provided has a strong impact on word-of-mouth recommendations, and their findings confirmed a direct and significant relationship. To evaluate these aspects in the e-health context, the following hypothesis was defined:

H5 – Recommendation intention directly depends on patient satisfaction.

Based on these hypotheses, the conceptual model was developed as an adaptation of the 5Qs model:

Figure 1
Adopted Conceptual Model



Source: Developed by the authors (2025).

The adopted conceptual model, illustrated in Figure 1, represents the phenomenon of interest, in which the quality dimensions, subdivided into: quality of object, quality of process, quality of infrastructure, and quality of interaction, are related to satisfaction, which in turn influences patients' recommendation intention. This model, which will be presented in detail in the next section, was applied through an empirical study conducted with patients who participated in online consultations.

3 Research method

The following section describes the methodological procedures employed to obtain the research results, highlighting the research design as well as the stages involved in the data collection and analysis process.

3.1 Research approach

In this study, the survey method was used, aiming to determine whether relationships exist among the information provided that can explain specific characteristics of a population, in order to produce statistical data and quantitative or numerical information about aspects observed in the studied group (Babbie, 2003).

This study sought to identify the relationships among the variables under analysis, which characterizes it as correlational. The data supporting the research were collected at a single point in time from the target population of the investigation, thereby classifying the study as cross-sectional (Cooper & Schindler, 2015).

3.2 Data collection process

To achieve the objectives of this research, a structured questionnaire was developed using measurement scales for the variables involved in the study in order to collect primary data from the target population, namely teleconsultation patients in the city of Campina Grande, Paraíba.

For the development of the study, the sample size was determined based on the practical guidelines of Hair et al. (2009) to establish the minimum number of respondents. Accordingly, the total number of indicators in the data collection instrument was multiplied by five (118 > 23 * 5 = 115). Thus, the minimum sample size was set at 115, and the total number of

respondents reached 118. It is important to note that the sample was non-probabilistic by accessibility; that is, respondents were selected according to their willingness to participate in the study and their accessibility.

The data collection instrument consisted of 23 adapted statements related to the 5Qs scales, satisfaction, and recommendation intention. These were analyzed using a five-point Likert scale ranging from (1) strongly disagree to (5) strongly agree, as shown in Table 1. Additional questions regarding demographic characteristics were also included to better understand the respondents' profiles.

Figure 2

Scales used to measure the research constructs

Construct/Author	**Items**
Quality (Verma et al., 2020)	1. I felt a sense of well-being during the teleconsultation. 2. The professional had the necessary infrastructure to provide the service appropriately. 3. The teleconsultation service is safe. 4. The professional delivered the service as promised. 5. I did not have to wait to schedule the teleconsultation. 6. I did not have to wait to be attended to in the teleconsultation. 7. The teleconsultation made the scheduling and care process simple. 8. The teleconsultation saved me a lot of time. 9. The professional who attended me had the necessary skills to provide the teleconsultation service. 10.The professional has their own platform for conducting teleconsultations (e.g., website or app). 11. The professional's platform has a specific section for teleconsultations (e.g., scheduling and care). 12. The professional offers electronic payment options for the service provided, either privately or through health insurance. 13. I received updates from the professional about the consultation. 14. I received electronic communication about possible delays or cancellations. 15. It was easy and convenient to communicate with the professional through the teleconsultation platform. 16. It was possible to communicate with the professional immediately through the teleconsultation platform. 17. Instructions about medications, care, and payment methods were sent electronically.
Satisfaction (Srivastava & Oza, 2006).	1. I was satisfied with the teleconsultation. 2. I obtained the result I expected from the teleconsultation. 3. I was pleased to be attended to through teleconsultation.

Recommendation Intention (Maxham III & Netemeyer, 2002).	1. I am very likely to speak positively about the teleconsultation service. 2. I will recommend the teleconsultation service to my friends. 3. If my friends need a consultation or healthcare service, I would recommend that they seek care through teleconsultation.

Source: Developed by the authors based on the cited studies (2025).

The questionnaire was administered through the Google Forms platform. Respondents accessed the questionnaire via the social media platforms WhatsApp, Instagram, and Facebook. In this process, the initial respondents referred new participants to the study, and so on, until the defined target was reached (Baldin & Munhoz, 2011). In addition, face-to-face applications were conducted at selected locations in the city. Data collection began on April 4, 2023, and ended on May 12, 2023.

3.3 Analysis process

Regarding data analysis, the data matrix was first inspected to identify missing values and outliers, in order to detect information that deviated from the overall pattern (Tukey, 1977). Next, to validate the reliability of the scales, Confirmatory Factor Analysis (CFA) and Cronbach's Alpha were applied (Hair et al., 2009).

In addition, Structural Equation Modeling (SEM) was employed. This is a confirmatory technique that involves developing the theoretical model prior to data collection, with the main objective of confirming or rejecting the data in terms of the behavioral pattern identified, based on the theoretical rationale (Ribas & Vieira, 2011; Hoyle & Isherwood, 2013; Marôco, 2014). All analyses were performed using the statistical software The R Project for Statistical Computing – R, version 3.6.0.

4 Analysis and discussion of results

This section presents and discusses the analyses of the results obtained from the data collection. First, the sample was characterized to provide a clearer description of the respondents. Next, the scale validation and measurement of the variables used were conducted, followed by the testing of the previously proposed hypotheses.

4.1 Description of the sample

The valid sample consisted of 118 respondents with the following demographic profile: 67.80% female and 32.20% male. The average age was 30 years, with a median of 27 years. Regarding marital status, 45.76% were single. With respect to household income, 33.05% reported earning up to two minimum wages. In terms of education, 34.75% had not completed higher education. In addition, within this sample, 39.83% of patients were attended by a psychology professional. Overall, 27.12% reported receiving care once per week.

4.2 Scale Validation and Construct Measurement

To verify the reliability of the scales used to measure the constructs in this study, Confirmatory Factor Analysis (CFA) was performed, as it allows the confirmation of whether the variables are associated with their respective factors specified in the model (Anderson &

Gerbing, 1988). In addition, Structural Equation Modeling (SEM) was employed, whose main function is to specify and estimate models that indicate relationships among variables (Kline, 2015).

To assess the internal consistency of the scales, the Ordinal Alpha and Omega reliability measures were used. These indicators were chosen because they are more appropriate for ordinal scales, such as those of the Likert type (Kline, 2015; Rosseel, 2012). Both range from 0 to 1, with values above 0.70 considered indicative of good reliability (Hair et al., 2005). The table below presents the results, showing that all scales achieved satisfactory indices.

Table 1

Cronbach's Alpha, Composite Reliability, and Average Variance Extracted

Construct	α Ordinal	ω Ordinal	Average Variance Extracted
Quality of object	0.903	0.953	0.911
Quality of process	0.966	0.967	0.936
Quality of infrastructure	0.915	0.873	0.776
Quality of interaction	0.954	0.949	0.906
Satisfaction	0.931	0.897	0.821
Recommendation Intention	0.949	0.908	0.833

Source: Research Data (2025).

For a more detailed analysis of the constructs, composite reliability was also assessed, yielding results above the minimum recommended value of 0.60 (Bagozzi & Yi, 2012). In addition, the average variance extracted (AVE) assumed values higher than the minimum acceptable threshold of 0.50 (Hair et al., 2005; Kline, 2015).

Regarding discriminant validity, the methodology of Chin et al. (1997) was applied, aiming to analyze the extent to which the scales measure what they are intended to measure. In other words, the expectation is that the constructs should not be highly correlated with each other. In this case, only the relationship between recommendation intention and satisfaction did not present a discrepancy, which can be explained by the strong association between these two variables. For the remaining constructs, discriminant validity was ensured, since the square root of the AVE of each construct, represented by the diagonal of Table 2, was greater than the squared correlation values among the other constructs.

Table 2

Discriminant validity of the model

Constructs	QOB	PRO	INF	INT	SAT	REC
QOB	0.954					
PRO	0.411	0.970				
INF	0.007	0.131	0.881			
INT	0.468	0.506	0.182	0.952		
SAT	0.659	0.560	0.124	0.497	0.910	
REC	0.688	0.559	0.116	0.557	0.946	0.913

Source: Research Data (2025).

From the descriptive statistics, two measures of central tendency were calculated, mean and median, along with one measure of dispersion, the standard deviation. Table 3 shows that the construct with the highest mean was quality of process, with a score of 4.54, in which half of the sample indicated the maximum score for this dimension. In addition, it presented the lowest standard deviation, highlighting that clients have a positive perception regarding the practical applications of the service provided to them.

By contrast, quality of infrastructure obtained the lowest mean, with a score of 3.73, which may be explained by the lack of use of specialized platforms by professionals, such as those with more effective scheduling and service mechanisms for this type of care.

Patients also demonstrated high satisfaction with the teleconsultation service. This construct had a mean of 4.24, with half of the participants reporting the maximum agreement score. This, in turn, contributed to recommendation intention reaching a mean of 4.06, since respondents were satisfied with the service delivery. However, this construct showed the highest standard deviation, equal to 1.24. This finding may be related to the fact that consumers' willingness to recommend the service depends on the healthcare specialty involved.

Table 3

Statistical descriptive of the constructs

Construct	Mean	Median	Standard Deviation
Quality of object	4.22	4.50	1.00
Quality of process	4.54	5.00	0.93
Quality of infrastructure	3.73	3.50	1.05
Quality of interaction	4.32	4.75	1.02
Satisfaction	4.24	5.00	1.10
Recommendation Intention	4.06	4.50	1.24

Source: Research Data (2025).

4.3 Model and hypotheses testing

In this analysis, the structural model was also tested (Bagozzi & Yi, 2012; Anderson & Gerbing, 1988). The evaluation of goodness-of-fit (GOF) was carried out using multiple indicators: χ^2 (chi-square), χ^2/df (chi-square per degrees of freedom), NFI (Normed Fit Index), IFI (Incremental Fit Index), TLI (Tucker–Lewis Index), CFI (Comparative Fit Index), GFI (Goodness-of-Fit Index), RFI (Relative Fit Index), RMSEA (Root Mean Square Error of Approximation), and SRMR (Standardized Root Mean Square Residual).

Table 4

Model fit

Index	Criterion	Structural Model
X^2		69.473
Gl		44.00
NFI	≥ 0.900	0.950
IFI	≥ 0.900	0.981

TLI	≥ 0.900	0.971
CFI	≥ 0.900	0.981
GFI	≥ 0.900	0.918
RFI	≥ 0.900	0.925
RMSEA	≤ 0.08	0.071
SRMR	≤ 0.05	0.043

Source: Research Data (2025).

As shown in Table 4, the model obtained a chi-square (χ^2) value of 69.473 with 44 degrees of freedom (df). The fit indices used (NFI, IFI, TLI, CFI, GFI, and RFI), which compare the proposed model with the null model, were all close to the 1.0 criterion for perfect fit (Kline, 2015). The RMSEA was also within the acceptable threshold (Arbuckle, 2012), as was the SRMR. These results indicate an adequate fit in the measurement of the latent constructs. Based on this, it was confirmed that the adaptation of the scales was appropriate.

Next, it was verified that 3 out of the 5 hypotheses proposed in this research were supported, considering that the t-test values were within the ranges recommended in the literature, $t > 1.96$ and $p \leq 0.05$ (Hair et al., 2005).

Table 5

Hypothesis test

Hypothesis	β	Error	z-value	p-value	Status
H1. QO ➞SAT	0.443	0.072	6.141	0.000	Supported
H2. QP ➞ SAT	0.266	0.073	3.623	0.000	Supported
H3. INF ➞SAT	0.035	0.033	1.058	0.290	Not Supported
H4. INT ➞SAT	0.100	0.055	1.810	0.070	Not Supported
H5. SAT ➞REC	1.347	0.120	11.204	0.000	Supported

Source: Research Data (2025).

The data from this research supported hypothesis H1, in which quality of object is related to patient satisfaction, demonstrating that clients need to feel a sense of well-being and security with teleconsultation in order to be satisfied. Subsequently, the data supported H2, indicating that quality of process is associated with satisfaction. This means that service agility is relevant to client contentment. This finding is consistent with Shabbir et al. (2016), who in their analyses found that service quality and satisfaction are positively related.

Regarding quality of infrastructure, it was found, as in the studies of Verma et al. (2020), that no statistical significance was observed, despite the positive relationship with satisfaction. Thus, hypothesis H3 was not supported, which may be explained by the early stage of teleconsultation in Brazil. According to Serrano et al. (2021), deficiencies in technical infrastructure are one of the barriers hindering the expansion of telemedicine in Brazil. Many professionals still do not use dedicated platforms to schedule and provide consultations. In many cases, social media applications such as WhatsApp and Instagram, as well as phone calls for scheduling and video calls via Google Meet, are used instead.

In addition, the data from this research did not support hypothesis H4, which relates quality of interaction to satisfaction. This finding may suggest that although the relationship is positive, quality of interaction, which includes the methods adopted and the amount of time

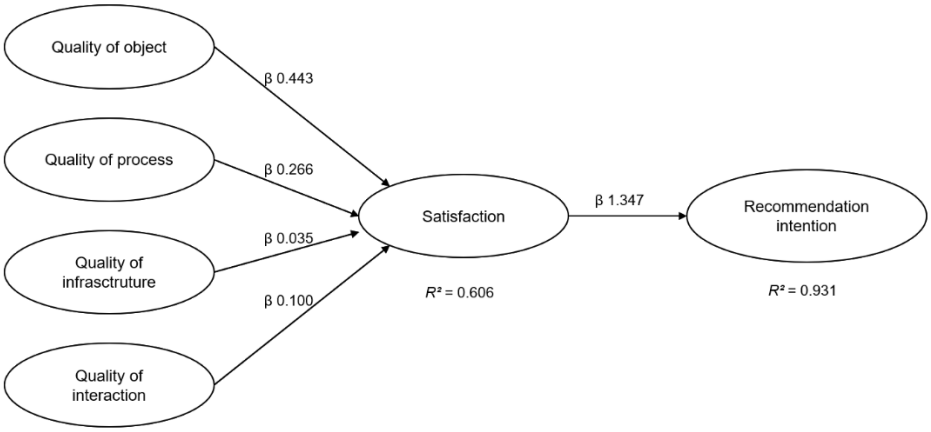
spent in communication between patients and healthcare professionals, may not be one of the main predictors of satisfaction when consumers are focused on the process. It can be inferred that consumers may have a pre-established trust in the methods chosen by professionals.

On the other hand, the results showed that satisfaction has a positive and significant relationship with recommendation intention, which supports hypothesis H5. This indicates that a satisfied client is more likely to return and refer new patients to a healthcare organization, contributing to professionals' word-of-mouth marketing. Therefore, it is essential that healthcare professionals pay close attention to user satisfaction with the services they provide, since global competition is also present in the healthcare sector, making patients more cautious about the services they receive (Fatima et al., 2018).

From these considerations, it was possible to identify the importance of quality of object and quality of process for patient satisfaction. Thus, teleconsultation professionals should strive to provide their clients with comfort and security while developing processes that facilitate service delivery. This will directly contribute to increasing the likelihood of users recommending them. Figure 3 presents the conceptual model containing the representation of the relationships proposed in this study.

Figure 3

Final Adopted Conceptual Model



Source: Research Data (2025).

As shown in the model, 60.6% of the variance in satisfaction is explained by service quality, and 93.1% of recommendation intention is explained by patient satisfaction. According to the data, satisfaction plays a mediating role between quality and recommendation intention.

5 Conclusions

This study aimed to analyze the influence of perceived e-health quality on satisfaction and recommendation intention among individuals who used healthcare services through teleconsultation. The findings revealed that quality of process and quality of object are the dimensions with the highest perceived quality according to e-health patients, and that quality is strongly related to satisfaction, which in turn significantly affects recommendation intention. These results reinforce the need for strategies focused on patient experience, ensuring efficient and safe care to increase retention and loyalty.

The study provides new evidence that supports the discussions of Verma et al. (2020) and Verma et al. (2022), showing that the 5Qs model is broader and includes more comprehensive quality dimensions for measuring patients' perceptions of quality. Although Verma et al. (2020) identified quality of interaction and atmosphere as predictors of satisfaction, the findings of this study indicate that process and quality of object were the most relevant dimensions for e-health patients. This suggests that, in the Brazilian context, other aspects may be more decisive for patients' quality perceptions. These findings also align with Shabbir et al. (2016), who reported a positive relationship between service quality and patient satisfaction, and with Medeiros (2018), who found that customer satisfaction with care increases the likelihood of recommendation. This study makes significant contributions to marketing research by analyzing the proposed relationships among quality dimensions and by supporting the design of better healthcare services in Brazil. Furthermore, it validated the use of the 5Qs model in the Brazilian healthcare context.

This study may also provide useful insights for healthcare managers in developing strategies aimed at improving service delivery through technology, particularly in light of the regulation of teleconsultation, which may lead to its permanent adoption. To achieve better care, attention must be given to quality aspects that enhance patient satisfaction.

Although the research achieved its objectives and contributed to the field, it presented some limitations. It was challenging to find individuals belonging to the target population, since teleconsultation began to be more widely used in Brazil after the Covid-19 pandemic and is still gaining users. Consequently, it was not possible to reach a larger sample, and some responses had to be excluded due to a lack of attention from participants. Because the sampling was non-probabilistic by accessibility, the results should be interpreted with caution, as they do not allow for generalization to the broader population. For future research, the adoption of strategies that reduce potential sampling biases is recommended, such as using more diverse recruitment techniques and, whenever possible, applying probabilistic methods to increase participant representativeness.

Finally, future research should examine differences in quality perception according to healthcare specialty. In addition, patients' trust and perceived risk in relation to technology-mediated consultations should be assessed, given that many users are accustomed to conventional in-person visits and may feel insecure about receiving medical care virtually.

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