

Applicability of the Servqual Scale for Analyzing the Perceived Quality of Public Health Services during the Covid-19 Pandemic in the Municipality of Três Rios/RJ, Brazil

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Abstract: The research aimed to analyze the perception of the population of Três Rios/RJ about the quality of public health services during a pandemic, using an adaptation of the Servqual scale. An exploratory, descriptive and quantitative study was carried out using a survey, with a sample of 400 individuals calculated by Mattar's research (2001), with 95% reliability and a sampling error of 5%. A questionnaire adapted from the Servqual model by Parasuraman, Berry and Zeithaml (1988) was used, applied remotely and in person, addressing the dimensions of Reliability, Responsiveness, Empathy, Security and Tangibility. The results indicated discrepancies between user expectations and perceptions in various areas. In Reliability, failures to keep promises and perform procedures correctly stand out, affecting patient confidence. As for Responsiveness, there was a demand for more agile and effective responses. In the Empathy dimension, although individualized care was perceived positively, there were gaps in receptiveness to clinics and adaptation of care to patients' needs. Safety was compromised by a lack of confidence in the procedures and technical knowledge of the professionals. In Tangibility, deficiencies were observed in the infrastructure and physical resources of health services. These results highlight the need for improvements to better meet patients' expectations and needs during health crises. However, the research has limitations, such as a focus on a single city and a quantitative approach that cannot fully capture the complexity of users' experiences.

Keywords: Servqual; Quality; Services; Health; Pandemic.

1. INTRODUCTION

At the end of 2019, the World Health Organization (WHO) signaled the emergence of a new virus in Hubei province, in Wuhan, China. Following this, the news gained worldwide prominence and, in March 2020, a global health emergency was declared with the advent of the Covid-19 pandemic. The new coronavirus spread rapidly between countries, causing implications in various sectors of society, especially in the health sector (Froes, 2020).

The pandemic has helped to highlight the failings of health systems in various countries, thus demonstrating the need for investment in infrastructure and resources to deal with public health emergencies on a global scale. In Brazil, working conditions were further aggravated by the precarious infrastructure of the work environment, the lack of personal protective equipment (PPE), excessive working hours and the lack of training for professionals working on the front line to combat the virus (Rodrigues; Silva, 2020).

According to data from the National Council of Health Secretaries (CONASS), in March 2021 the country reached a record of 12,766 people on the waiting list for an Intensive Care Unit (ICU) bed, which highlighted the lack of infrastructure and resources available to deal with the growing demand for critically ill patients due to Covid-19. In addition, several Brazilian states, such as Amazonas and Rio de Janeiro, even recorded more than 90% occupancy of ICU beds for patients infected with the new coronavirus.

In this scenario, professionals in the Brazilian public health system were no longer able to meet the high demand for patients, which resulted in a lack of beds, medical equipment and professionals trained to deal with the complexities of the clinical condition presented by people infected with the new coronavirus. As a consequence, this has contributed to affecting the working situation in the health sector in the country, thus having a direct impact on the quality of the service provided to the population (Campiolo et al. 2020).

According to Nazario et al. (2018, p. 200), quality management in the healthcare sector can be defined as a "continuous process of planned activities, based on reviewing performance and setting specific targets, with the aim of improving the effective quality of care provided". It is therefore a form of management that requires the application of medical technology to bring benefits to the lives of the population, taking into account the resources available and patient satisfaction with the care received.

Evaluating the quality of health services is part of the process of continuous improvement and, because of this, managers must ascertain the perceptions and expectations that patients have of the service offered. This has become increasingly important at a global level, not only for administrators and health professionals, but also for governments. Through regulatory measures and investments in technology and training of professionals, the government can contribute to improving the quality of health services offered to the population, aiming to meet the needs and expectations of patients in an efficient and humanized way (Baó et al., 2019; Caldeira, 2019).

Authors such as Galdino et al. (2016) add that quality management in services is a fundamental tool for increasing the competitiveness of organizations, especially in times of crisis. In the specific case of the public health sector, the demand for services has increased significantly during the pandemic and, as a result, organizations have had to adopt labor measures to guarantee the quality of care provided to the population. With the increase in demand for services and the need to adapt to the restrictions imposed by the health crisis, quality management has proved essential to guarantee the effectiveness of public health services in a challenging period such as the pandemic, contributing to the protection of life and health of the population.

However, Oliveira and Reis (2016) reiterate that there are a number of factors that make it difficult to assess the quality of public health services in the country. These factors include the lack of institutionalization of evaluation parameters in the planning and management of Brazilian institutions, fragmentation in the use of information, regional and socio-economic inequalities and, finally, the complexity of carrying out research in a country with continental proportions. Despite the various strategies adopted by the managers of the Unified Health System (SUS), there is still a major challenge in reconciling the scarcity of resources with the guarantee of comprehensive public health. It is therefore necessary to look for evaluation strategies to help overcome this problem, while maintaining the competitive advantage and quality of the public health system.

In this context, the Servqual scale has emerged as a theoretical-methodological approach capable of helping to assess the quality of public health services. The Servqual scale was originally developed by Parasuraman, Berry and Zeithaml in 1988 in order to measure the quality of services through the differences between the expectations and perceptions of users and/or consumers. The Servqual scale measures service quality through five dimensions: tangibility, reliability, responsiveness, security and empathy.

During the Covid-19 pandemic, the use of the Servqual scale has become even more important, as the demands and expectations of users of public health services have been expanded and redefined. Evaluating the quality of services provided during this period makes it possible to understand the emerging needs of the population and adapt management practices in line with these demands. By analyzing these gaps, managers can identify areas for improvement and implement corrective actions to enhance the quality of services. Nevertheless, the Servqual scale can also provide information for strategic decision-making and the efficient allocation of resources (Cruz; Melo; Sobral, 2022).

In view of the above, the general objective of this research was to analyze the perception of the population of the municipality of Três Rios/RJ in relation to the quality of public health services during the pandemic, by adapting and applying the Servqual scale.

The results of this investigation will be important for identifying possible gaps and areas for improvement in Três Rios' public health services. Based on the perceptions of the local population, it will be possible to direct efforts towards improving the health system, seeking to guarantee efficient and quality care not only for the people of Três Rios, but also for the individuals who depend on the services of this region. In this way, the results of this study can contribute to strengthening the health system in Três Rios, providing a better experience of care and promoting the quality of life of the local population and surrounding regions after the Covid-19 pandemic.

As Tucci et al. (2017) point out, it is common for the scientific community's efforts to focus on the mechanisms of pathological agents during pandemics, thus neglecting the implications that such an event can have on other spheres of society, such as health. It is therefore hoped that this article will make a contribution through the proposed analysis, which will provide theoretical and practical support regarding the quality of public health services in the municipality of Três Rios/RJ during the pandemic period.

2. METHODOLOGY

According to Vergara (2000), the method can be understood as an organized set of procedures designed to obtain answers about a certain phenomenon. Thus, the methodology serves as a guide for the researcher in their investigations, providing scientific rigor that ensures the reliability and validity of the results obtained. Because of this, the validity of any investigation is intrinsically linked to the quality and robustness of the procedures adopted.

In this sense, the procedures adopted in this research took into account the *Diagram of Research Stages* proposed by Gil (2002). The use of this diagram served as a structure to guide methodological decisions, from defining the objectives to analyzing the results, thus contributing to the consistency and reliability of the steps to be followed throughout the study.

The *Stages of Research Diagram* states that research should have the following stages: formulating the problem, defining the objectives, choosing the research method, determining the variables, defining the field of action, designing the research instruments, defining the data collection procedures, analyzing and interpreting the data and, finally, documenting and recording the conclusions. It is hoped that, at the end of this chapter and by detailing the method, it will be possible to provide readers with an understanding of how this research was carried out.

2.1. Type of Research

For the methodological classification of this research, we used the taxonomy proposed by Vergara (2000), which presupposes two categories for research: ends and means. Thus, with regard to the purposes, this research was characterized as descriptive and exploratory with a quantitative approach; and with regard to the means, it was configured as a bibliographical study and *survey*.

2.1.1. Classification of Research by Purpose

In terms of purposes, this research was characterized as exploratory, since the aim was to explore the sample universe in order to obtain more precise formulations and gain familiarity with the problem under analysis. As reiterated by Aaker, Kumar and Day (2004), exploratory research is focused on understanding a particular phenomenon in order to get closer to the problem under study and build alternative hypotheses.

Exploratory research can also be carried out using two approaches: the quantitative approach and/or the qualitative approach. The quantitative approach is linked to the quantification of data using statistical resources in order to measure variables and the relationships between them, using methods such as structured questionnaires, statistical tests and numerical analysis. This approach provides a more objective view and allows statistical generalizations, which is useful for identifying trends, patterns and cause and effect relationships.

The qualitative approach, in turn, focuses on understanding the perceptions, representations and meanings attributed by the subjects involved in the study. The qualitative approach uses techniques such as open-ended interviews, participant observation and content analysis to capture the complexity

and subjectivity of human experiences. Through this method, it is possible to gain deep *insights*, understand social and cultural contexts and explore complex phenomena that cannot be easily quantified (Godoy, 1995).

A quantitative approach was used in this research, as the aim was to analyze the quality of the public health service in the municipality of Três Rios/RJ during the Covid-19 pandemic and, to this end, it was necessary to use statistical resources to present the results and analyze them. Thus, the investigation was based on a classic paradigm, which "understands that scientific knowledge is in the facts, so scientific work must strive to purify the object, relegating what is not essential, so that the researcher can describe the general and reproducible facts." (Ferreira, 2015, p. 115).

With this in mind, structured questionnaires with closed alternatives were used due to the large number of individuals in the sample, making it necessary to use mathematical instruments to carry out the study. As a result, it was possible to measure the data using descriptive statistics (tables, absolute frequencies, relative frequencies, standard deviation and averages) and through the existing *gaps* between patients' perceptions and expectations.

Still in terms of purposes, this research was also configured as descriptive, which seeks, according to Sampieri, Collado and Lucio (2013, p. 102), "to specify the properties, characteristics and profiles of people, groups, communities, processes, objects or any other phenomenon that is subject to analysis". In the specific case of this research, the descriptions and specifications were linked to the perceptions that people in the municipality of Três Rios/RJ have about public health services during the pandemic.

As reiterated by Gil (2002, p. 42), "descriptive research is, along with exploratory research, what social research concerned with practical action is usually carried out". Therefore, this research aimed to describe the characteristics of the population studied and establish the relationship between its variables, thus corroborating what the author suggests.

2.1.2. Classification of Research by Means

As far as the means are concerned, this research was configured as bibliographical research, since bibliographic materials were used with the intention of obtaining a theoretical systematization about the central theme of this study. According to Prodanov and Freitas (2013), this type of research aims to put the researcher in direct contact with the existing material on the research subject, and it is important to verify the veracity of the data obtained through the inconsistencies or contradictions that the works may have.

The bibliographic survey took place on the Google Scholar, *Scielo*(*Scientific Electronic Library Online*) and *Web of Science* platforms, providing a range of materials, including scientific articles, books, book chapters, theses, dissertations, technical reports and other documents. Surveys were also carried out on the databases of Master's and Doctoral Programs in Administration at Brazilian universities.

These databases were searched using search operators. According to Araújo et al. (2020), search operators are symbols, keywords or specific techniques used in search engines or databases to refine and direct the results of a search. In the case of this specific study, expressions associated with the term "AND" were applied in order to delimit the results, making the search more precise and targeted to the research interests. To this end, the following terms were used: "servqual AND health", "servqual AND pandemic", "public health AND pandemic", "servqual AND adaptation AND health" and "quality in service AND public health".

With regard to the classification of the research in terms of means, the *survey* method was also applied, which in turn consists of collecting data through structured questionnaires applied to a representative sample of the target population. The survey method is widely used in marketing research and allows quantitative information to be obtained on the attitudes, opinions, behaviors and demographic characteristics of the respondents (Mineiro, 2020).

The *survey* consisted of collecting data using structured questionnaires, which were applied to the sample in this study. Through this technique, it was possible to obtain specific information on the opinions, attitudes and behaviors of the participants in relation to the central theme of this research.

In this way, while the bibliographical research provided a theoretical review of the application of the Servqual scale in the public health sector during the pandemic, the survey method made it possible to collect empirical data directly from health professionals and users of health services. The combination of these two approaches provided both a theoretical basis and a base of empirical data on the subject.

2.2. Sample

To define the sampling plan for this research, which is characterized as the selected portion of the population universe, probabilistic sampling was used, as each element of the population had a "known and non-zero chance of being selected to make up the sample (Mattar, 2001, p. 132)". With regard to the sampling technique, simple random probability sampling was applied, which, according to Malhotra (2001), corresponds to a sample made up of elements taken at random from the population, where the individuals have the same probability of being chosen.

In the case of this study, the population was represented by the inhabitants of Três Rios/RJ, a city with approximately 82,142 inhabitants (IBGE, 2020). Thus, as the number of elements is infinite and greater than 10,000, the population of this research was called infinite, thus determining a sample with a reliability of 95% and a sampling error of 5%, corroborating what Stevenson (2011) suggests. To calculate the sample size, the Mattar (2001) equation will be used, where n = sample size; P = probability of occurrence of the variable being researched in the population; e = sampling error. As a result, a sample field consisting of 400 elements was defined, as can be seen in the equation below.

$$n = 455 / e^2$$

$$n = 4 \times 0,50 \times 0,50 / (0,05)^2$$

$$n = 400$$

As a selection criterion, the interviewee was required to have used the public health service in the municipality of Três Rios/RJ at least once during the Covid-19 pandemic. Individuals who did not use the city's public services during the pandemic were discarded.

2.3. Pre-test

According to Malhotra (2001, p. 291), pre-testing is "testing the questionnaire with a small sample of respondents in order to identify and eliminate potential problems". Thus, the pre-test of this research was carried out with a limited sample of 30 people, in order to identify possible errors in the questionnaire and improve it. As a result, adaptations were made in order to offer a survey instrument that was more accessible to respondents.

For the pre-test questionnaire, the *Servqual* scale was adapted to take into account the nature of public health services during a pandemic. At the end of the questionnaire, two questions were asked to help improve the research instrument: "Did you have any difficulties filling in the questionnaire? If so, what?" and "What suggestions would you make to improve this questionnaire?".

Given that the data was collected remotely and in person, the pre-test was applied in both ways, with 15 respondents for each test. In the remote format, the questionnaire was prepared on the *Google Forms* platform and posted on social networks such as *Instagram*, *WhatsApp* and *Facebook*. In the face-to-face test, the questionnaire was administered on the streets of the city of Três Rios, Rio de Janeiro, by means of convenience selection, where the answers were filled in manually.

In addition to providing a more accessible research instrument, the pre-test provided the following benefits: identification of the respondent's behavior *on site*, analysis of the length of the interview and verification of the most relevant items to be addressed in the survey. Based on the results and feedback obtained during the pre-test, the appropriate adaptations were made to the questionnaire, such as adjustments to the questions, clarification of terms, among others, in order to make it clearer and more understandable to the interviewees during the data collection phase.

2.4. Data Collection

After the pre-test, data was collected using a questionnaire adapted from the *Servqual* model by Parasuraman, Zeithaml and Berry (1988), which consisted of a *Likert-type* scale with multiple-choice questions. The *Likert scale* used presented a set of statements ranging from one to five points, which

made it possible to measure the interviewees' attitudes according to the degree of agreement they gave to the questions. This scale was devised by Likert (1935) and is based on a psychometric method that combines applied mathematics with psychology, whose alternatives range from "(1) totally disagree", "(2) partially disagree", "(3) neither agree nor disagree", "(4) partially agree" to "(5) totally agree".

The survey instrument encompassed the five dimensions of the *Servqual* model (tangibility, reliability, responsiveness, safety and empathy) and thus made it possible to assess the quality of the public health service during the pandemic. The questionnaire was divided into two parts. The first part sought to assess respondents' expectations (E), while the second analyzed their perceptions (P) of the performance of the public health service. Chart 5 illustrates the adapted Servqual model that was used to collect data for this study.

Table 5. *Adapted Servqual model*

Dimensions	Items
Reliability	Keeping promises to patients during the pandemic
	Sincere interest in solving the problems of patients affected by the pandemic
	Correct execution of health procedures and protocols on the first attempt
	Meeting the deadlines set for patient care and treatment
	Keeping patients informed of COVID-19-related appointments and test results
Responsiveness	Provide health services promptly to patients, prioritizing those in urgent or critical situations related to COVID-19
	Willingness to help and offer adequate support to patients affected by the pandemic
	Fast and efficient response to requests for health-related information, guidance or appointments during the pandemic
Empathy	Individualized care for patients, taking into account their fears, concerns and specific needs during the pandemic
	Openness to listening to patients' complaints and suggestions, seeking continuous improvements in the public health service
	Addressing patients' interests and adapting healthcare measures according to their needs and realities during the pandemic
	Understanding patients' specific needs related to COVID-19
Security	Giving patients confidence during the COVID-19 pandemic
	Security in health transactions and procedures carried out with patients affected by the pandemic
	Kind and respectful treatment of patients during COVID-19-related care
	Technical knowledge to answer patients' questions and concerns about COVID-19
Tangibility	Modern and up-to-date physical equipment and instruments to tackle the COVID-19 pandemic
	Visually appealing facilities that convey safety and confidence to patients during the pandemic
	Well-presented staff who adopt appropriate personal protective measures when caring for patients affected by COVID-19
	Materials with visual appeal inherent to the type of service offered to ensure safety and prevent the spread of COVID-19
	Convenient opening hours for patients during the pandemic

Source: *Adapted from Parasuraman, Berry and Zeithaml (1988).*

The adaptation of the Servqual scale for the public health sector during the COVID-19 pandemic was carried out following a systematic process. Initially, an in-depth analysis of the original dimensions and items of the SERVQUAL scale, developed by Parasuraman, Berry and Zeithaml in 1988, was carried out. The original dimensions (Reliability, Responsiveness, Empathy, Safety and Tangibility) were kept as the basis for the adaptation, as they are still relevant for assessing the quality of health services during the pandemic.

In this sense, each item in the original dimensions was assessed for its suitability in the context of the COVID-19 pandemic. All the items were modified to better reflect the specificities of the public health sector during the pandemic, addressing issues such as keeping promises, interest in solving problems, providing services promptly, individualized care, security in transactions and the condition of equipment and facilities.

2.5. Data Analysis

To analyze the data, the difference between the averages obtained for each statement was first calculated, thus arriving at the Gap values, which in turn seek to measure the difference between the observed value (Disp. Orig) and the average of the control data (Disp. Ref) by means of uniform random variables. Once the Gaps values had been obtained, it was assessed whether or not the data was distant from the observed set. In this case, negative Gaps were designated as critical and therefore indicated the dimensions with possible flaws in service provision. For Parasuraman, Berry and Zeithaml (1988), the equation below illustrates the calculation used for this analysis.

$$Q_j = D_j - E_j$$

Where:

Q_j: evaluation of the quality of the service from the point of view of the interviewees;

D_j: perception values that respondents give to the performance of a given characteristic *j* of the service offered;

E_j: expectation values that respondents give to the performance of a given service characteristic.

Given the above information, the average of the answers obtained in the statements proposed in the Servqual model were calculated in order to measure the expectations (E) and perceptions (P) of patients at the Três Rios Emergency Care Unit (UPA). The *SPSS (Statistical Package for the Social Sciences)* version 23.0 statistical software was used to help analyze the data, using descriptive statistics methods. According to Sampaio, Assumpção and Fonseca (2018), SPSS is a tool widely used for statistical data analysis in various fields of study, including the social sciences, psychology, education, medicine and business. Descriptive tools such as tables with averages, frequencies and/or percentages were used to quantify the data collected.

2.6. Characterization of the Municipality of Três Rios/RJ

2.6.1. General Information about Três Rios/RJ

The municipality of Três Rios/RJ is located in the Central South of Rio de Janeiro and was named after the three rivers that meet in the city to form the only Triple River Delta in Latin America: the Paraíba do Sul, Paraibuna and Piabanha rivers. The meeting of these rivers is considered one of the city's main tourist attractions, and sports such as *rafting are* common here.

The municipality is also known as the "Corner of Brazil" because it is strategically located, as two major federal highways cut through the city: BR-040, which connects Brasília to Rio de Janeiro, and BR-393, which connects Espírito Santo to Rio de Janeiro. Because of this, Três Rios has a significant industrial park, since companies take into account the ease of logistics that the municipality has, as well as the tax incentives and business attractions that have emerged in the city since 2009.

According to the Brazilian Institute of Geography and Statistics (2020), the territorial area of the municipality of Três Rios is approximately 322,843 km². The local population is estimated at around 82,468 people. The municipality is situated at an altitude of 269 meters and its geographical coordinates are: latitude 22° 07' 00" south and longitude 43° 12' 33" west. The municipality of Três Rios is currently a center of convergence in the Central-South region of Rio de Janeiro, and has been a growing stage for commercial and industrial development since 2012.

2.6.2. Access and Geographical Location of Três Rios/RJ

Because Três Rios/RJ is a reference health center for the surrounding regions, it is necessary to address the access and geographical location of the city. The municipality is located around 120 km from the capital of the state of Rio de Janeiro and just 68 km from Juiz de Fora, a micro-region in Minas Gerais. As a result, Três Rios has a favorable geographical position, being surrounded by highways, which makes it easy for people to access the city.

The municipalities that border the city of Três Rios are the municipality of Comendador Levy Gasparian, the municipality of Sapucaia, the municipality of São José do Rio Preto, the municipality of Areal and the municipality of Paraíba do Sul. Due to Três Rios' privileged location, it

is easy to access the city by road, as the two highways (BR-040 and BR-393) that cut through the municipality lead to so many other highways.

The municipality of Três Rios also has a territorial subdivision made up of the Central Region, the Vila Isabel Region, the Eastern Region, the Northern Region and the Western Region, as can be seen in Table 6.

3. RESULTS AND DATA ANALYSIS

3.1. Reliability

This study sought to analyze the quality of public health services in the municipality of Três Rios/RJ during the Covid-19 pandemic. The first question in the questionnaire was aimed at examining users' perceptions and expectations regarding the reliability of the services provided, i.e. the ability of professionals to deliver the service as promised.

We then asked about the fulfillment of promises made to patients, the interest in solving the problems of affected patients, the correct execution of health procedures on the first attempt, compliance with deadlines for care and treatment and keeping patients informed about deadlines and test results related to Covid-19. The results can be seen in Table 1.

Table 1. Reliability dimension

Assertions	Perception (P)	Expectation (E)	Gap
Keeping promises to patients during the pandemic	3,8724	4,6042	-0,7318
Sincere interest in solving the problems of patients affected by the pandemic	3,5203	4,2004	-0,6801
Correct execution of health procedures and protocols on the first attempt	4,2004	4,3050	-0,1046
Meeting the deadlines set for patient care and treatment	3,0235	4,7825	-1,7590
Keeping patients informed of COVID-19-related appointments and test results	4,3040	4,0120	0,2920

Source: Research data (2022-2023).

As a result, it was possible to see that most of the items in the dimension had negative indices, suggesting a gap between users' expectations and perceptions regarding the reliability of public health services during the Covid-19 pandemic in the municipality of Três Rios/RJ. This negative gap between expectations and perceptions indicates that, in general, users were not satisfied with the ability of health professionals to deliver the service as promised during the pandemic.

The biggest gap was seen in compliance with the deadlines set for patient care and treatment, which showed a negative gap of -1.7590. There is therefore a discrepancy between users' perceptions and expectations in relation to meeting deadlines during the pandemic, suggesting that deadlines in public health services during the pandemic were not met, causing negative impacts on users' experience and confidence.

With the advent of the Covid-19 pandemic and the proliferation of the new coronavirus, public health systems have been overwhelmed, facing unprecedented challenges in the provision of health services. The result presented, with a negative gap of -1.7590 in meeting deadlines for patient care and treatment, highlights the extent of these challenges in Três Rios/RJ.

With regard to the fulfillment of promises made to patients during the pandemic, there was a negative gap of -0.7318 between users' perceptions (P) and expectations (E). The result suggests that patients did not receive the level of care and commitment promised by health professionals, which resulted in a loss of trust and satisfaction on the part of users. The importance of this aspect is even more accentuated by the seriousness of the health situation, where patients depend entirely on public health services for their protection and treatment.

During the Covid-19 pandemic, promises made to patients take on even greater importance due to the critical nature of the health situation. Patients trust healthcare professionals to provide adequate and safe care, and any failure to fulfill these promises impacts users' trust, as was evidenced in this

research. Failure to fulfill promises made to patients not only compromises the effectiveness of healthcare services, but also impacts the relationship of trust between patients and healthcare professionals.

Similarly, sincere interest in solving the problems of patients affected by the pandemic also showed a negative gap of -0.6801, indicating a discrepancy between users' perceptions and expectations. The results show that there are shortcomings in the effectiveness of the actions taken to resolve patients' needs during the health crisis. The gaps in the interest of healthcare professionals in solving patients' problems are a barrier to building a relationship of trust and providing effective healthcare. In a pandemic context, where patients face not only medical but also emotional and social challenges, a lack of sincere interest on the part of healthcare professionals can exacerbate them even further.

However, it is important to note that the correct execution of health procedures and protocols on the first attempt showed a smaller negative gap of -0.1046. In other words, although there is room for improvement, users still perceive an acceptable level of reliability in this specific aspect.

Finally, the assertion related to keeping patients informed about deadlines for care and test results related to COVID-19 showed a positive gap of 0.2920. Users perceive a level of information above their expectations, highlighting the importance of transparent and effective communication during the pandemic. Thus, despite the problems highlighted around the reliability dimension, it can be seen that users perceive a level of information above their expectations during the pandemic. This highlights the importance of transparent and effective communication between healthcare professionals and patients, especially in times of crisis such as the Covid-19 pandemic.

3.2. Responsiveness

The analysis of the responsiveness dimension of health services in Três Rios/RJ during the COVID-19 pandemic reveals users' perceptions and expectations, as shown in Chart 2. The responsiveness dimension aimed to understand how health services responded to patients' needs in urgent or critical situations related to the pandemic, as well as their willingness to offer adequate and efficient support to patients' demands.

Table 2. *Responsiveness dimension*

Assertions	Perception (P)	Expectation (E)	Gap
Provide health services promptly to patients, prioritizing those in urgent or critical situations related to COVID-19	4,3560	4,8532	-0.4972
Willingness to help and offer adequate support to patients affected by the pandemic	4,3050	4,7122	-0.4072
Fast and efficient response to requests for health-related information, guidance or appointments during the pandemic	3,2005	4,8235	-1.623

Source: *Research data (2022-2023).*

Firstly, when considering the statement "provide health services promptly to patients, prioritizing those in urgent or critical situations related to COVID-19", it can be seen that patients' perception (P) was scored at 4.3560, while their expectations (E) were 4.8532. This resulted in a negative gap of -0.4972, indicating that respondents perceived a discrepancy between the quality of care received and their expectations regarding the prioritization of urgent or critical cases.

In this sense, it is important to note that users emphasized that they did not feel they were given priority attention, especially when it came to urgent demands. The lack of prioritization of urgent situations was a concern expressed by patients, which highlights the need for a more effective approach to triage and response to urgent cases during public health crises such as the COVID-19 pandemic.

From the same perspective, the willingness to help and offer adequate support to patients affected by the pandemic showed a negative deficit of -0.4072, i.e. there was a gap between the support received and their expectations in this regard. This gap between patients' perceptions and expectations highlights the importance of a more robust response on the part of health services, aimed at meeting patients' emotional, practical and informational needs during public health crises.

The gap identified was -1.623 when it came to fast and efficient service in response to requests for health-related information, guidance or appointments during the pandemic. Thus, it can be seen that efficiency and agility in meeting demands during the health crisis fell short of what users wanted.

These results highlight the importance of improving the responsiveness of health services, especially in times of crisis such as the COVID-19 pandemic. Identifying these gaps can guide the implementation of measures and policies to improve the readiness and effectiveness of services, ensuring a more appropriate response to patients' needs and strengthening trust in the care provided.

3.3. Empathy

The third dimension of the Servqual scale analyzed was empathy. The results obtained can be seen in table 3.

Table 3. *Empathy dimension*

Assertions	Perception (P)	Expectation (E)	Gap
Individualized care for patients, taking into account their fears, concerns and specific needs during the pandemic	4,2001	4,0145	0.1856
Openness to listening to patients' complaints and suggestions, seeking continuous improvements in the public health service	4,3056	4,4457	-0.1401
Addressing patients' interests and adapting healthcare measures according to their needs and realities during the pandemic	4,2578	4,4310	-0.1732
Understanding patients' specific needs related to COVID-19	4,3371	4,5702	-0.2331

Source: *Research data (2022-2023).*

In the context of the provision of health services during the COVID-19 pandemic, a crucial aspect is individualized care for patients, taking into account their fears, concerns and specific needs. The analysis of this item reveals a positive evaluation by patients, showing a perception (P) higher than their expectations (E) in relation to this specific aspect.

The gap between patients' perceptions (P) and expectations (E) resulted in a positive value of 0.1856. This positive gap indicates that patients perceived a level of individualized care that exceeded their expectations. In other words, in the opinion of patients, healthcare professionals went beyond what was expected when considering their fears, concerns and specific needs during the pandemic.

Patients' perception (P) was rated at 4.2001, indicating that, in their experience, they received care that took into account their fears, concerns and needs in an attentive and personalized way during the pandemic. The results show that healthcare professionals can demonstrate sensitivity and adaptability when dealing with the particularities of each patient, providing personalized care that has taken into account the challenging context of the pandemic. This analysis suggests that, in this specific aspect, health services were able to meet and even exceed patients' expectations.

Still in the evaluation of the provision of public health services, another crucial aspect concerns the openness to listen to patients' complaints and suggestions, seeking continuous improvements in the public health service. When examining this element, a difference was noted between patients' perceptions and their expectations. The difference between patients' perceptions and expectations resulted in a negative value of -0.1401. This gap indicates that there was a discrepancy between what patients experienced in terms of openness to hearing their complaints and suggestions and what they expected to find.

From this perspective, patients felt that the willingness to listen to their concerns did not reach the level they had hoped for. This analysis suggests that, although there is recognition on the part of patients of some degree of openness to expressing their opinions, there is still room for improvement in the way complaints and suggestions are received and dealt with by public health institutions.

The gap between patients' perceptions and expectations in relation to the statement "meeting patients' interests and adapting healthcare measures according to their needs and realities during the pandemic"

resulted in a negative value of -0.1732. This difference indicates that patients felt that the healthcare measures adopted during the pandemic did not fully meet their expectations in terms of personalization and adaptation. In other words, this effort was perceived as insufficient in relation to what was expected.

When analyzing patients' perception of their understanding of their specific needs related to COVID-19, there was a difference between this perception and their expectations, evidenced by the negative gap of -0.2331. This result suggests that there was a discrepancy between patients' perception of the understanding of their specific needs related to COVID-19 and their expectations.

3.4. Security

The fourth dimension analyzed was safety, which encompassed elements such as the transmission of trust to patients, safety in health transactions and procedures, treatment, gentle treatment and technical knowledge to answer patients' questions and concerns about Covid-19, as shown in Table 4.

Table4. *Security dimension*

Assertions	Perception (P)	Expectation (E)	Gap
Giving patients confidence during the COVID-19 pandemic	4,3123	4,4455	-0.1332
Security in health transactions and procedures carried out with patients affected by the pandemic	3,4890	4,9020	-1.4130
Kind and respectful treatment of patients during COVID-19-related care	4,3020	4,2005	0.1015
Technical knowledge to answer patients' questions and concerns about COVID-19	3,1005	4,5041	-1.4036

Source: *Research data (2022-2023).*

The table shows that the first assertion, now called "transmission of trust to patients during the COVID-19 pandemic", resulted in a negative gap of -0.1332. The results show that there was a gap between patients' perception of the transmission of trust and what they expected to receive during the pandemic.

Furthermore, the results reveal that patients' perception of safety in healthcare transactions and procedures during the COVID-19 pandemic was lower than their expectations. The score of 3.4890 for patients' perceptions contrasts with the higher score of 4.9020 for their expectations, resulting in a negative gap of -1.4130. It can thus be seen that the interviewees consider that health professionals did not provide safe care during the Covid-19 pandemic, indicating a lack of preparation to deal with the situation in a way that guarantees patient safety.

The positive gap of 0.1015 between patients' perceptions and their expectations indicates that, overall, patients felt that the kind and respectful treatment during COVID-19-related care exceeded their expectations. This suggests that healthcare professionals were able to offer a level of care and attention that was perceived as better than expected by patients. The positive gap reflects a care environment where patients felt valued, or where their concerns were addressed effectively, resulting in an overall satisfactory experience during the pandemic.

Finally, with regard to the statement "technical knowledge to answer patients' questions and concerns about COVID-19", the data reveals a significant negative difference of -1.4036 between patients' perceptions and their expectations. In this sense, patients felt that there was a lack of technical knowledge on the part of healthcare professionals to deal with their questions and concerns during the pandemic. The score of 3.1005 for patients' perceptions contrasts with the higher score of 4.5041 for their expectations, indicating a disconnect between what patients expected in terms of technical knowledge and what they actually received.

3.5. Tangibility

The last dimension analyzed was tangibility, which involved the physical elements that make up public health services, such as modern equipment and instruments, safe facilities, well-presented employees with personal protective equipment (PPE), materials with visual appeal inherent to the type of service provided and convenient opening hours for serving the population during the pandemic.

Table 5. *Tangibility dimension*

Assertions	Perception (P)	Expectation (E)	Gap
Modern and up-to-date physical equipment and instruments to tackle the COVID-19 pandemic	3,0102	4,7230	-1.7128
Visually appealing facilities that convey safety and confidence to patients during the pandemic	3,2028	3,9852	-0.7824
Well-presented staff who adopt appropriate personal protective measures when caring for patients affected by COVID-19	4,0901	4,4458	-0.3557
Materials with visual appeal inherent to the type of service offered to ensure safety and prevent the spread of COVID-19	3,5871	3,7829	-0.1958
Convenient opening hours for patients during the pandemic	4,5028	4,7245	-0.2217

Source: *Research data (2022-2023).*

Analysis of the tangibility dimension reveals gaps between patients' perceptions and their expectations in relation to the physical elements that make up public health services during the COVID-19 pandemic in Três Rios/RJ. Firstly, when examining the availability of modern and up-to-date physical equipment and instruments to deal with the pandemic, a negative gap of -1.7128 was observed. Thus, patients perceived a lack of equipment and instruments needed to deal with the pandemic, compared to their expectations, which negatively impacted the quality of care and patients' trust in public health services.

With regard to visually appealing facilities that convey safety and confidence to patients during the pandemic, a negative gap of -0.7824 was identified. In other words, the facilities did not meet patients' expectations in terms of safety and trust during the health crisis, negatively influencing the perception of health services.

With regard to staff presentation and the proper use of personal protective equipment (PPE) during care for patients affected by COVID-19, the gap identified was -0.3557. This suggests that, although staff may have adopted individual protection measures, patients' perception was that there is still room for improvement in the presentation and adoption of these measures, which may affect their trust in health services.

With regard to materials with the visual appeal inherent to the type of service offered to ensure safety and prevent the spread of COVID-19, a negative gap of -0.1958 was identified. In this bias, the materials used may not have been perceived by patients as sufficiently adequate to ensure their safety during the pandemic, which may have impacted their trust in health services.

Finally, in relation to convenient opening hours for patients during the pandemic, a negative gap of -0.2217 was identified. Patients perceived a discrepancy between the opening hours offered and their expectations regarding convenience during the pandemic, which affected accessibility to health services. These gaps highlight the need for improvements in the tangibility of public health services during health crises, in order to adequately meet patients' expectations and needs.

4. FINAL CONSIDERATIONS

Based on this exploratory research with a quantitative approach, the analysis of the SERVQUAL scale in the context of public health services in Três Rios/RJ during the Covid-19 pandemic revealed users' perceptions and expectations in relation to different dimensions: reliability, responsiveness, empathy, safety and tangibility.

In the reliability dimension, the results indicated a gap between users' expectations and perceptions. The negative indices highlighted failures to fulfill promises made to patients, interest in solving patients' problems, meeting established deadlines and performing health procedures correctly on the first attempt. This scenario reveals a general dissatisfaction among users regarding the ability of health professionals to provide services as promised during the pandemic, affecting patient trust and satisfaction.

In the responsiveness dimension, there was a gap between users' perceptions and expectations regarding the prompt provision of health services, the willingness to offer adequate support and the quick and efficient response to patient requests. These results highlight the need for a more agile and effective response from health services to meet patient demands during public health crises.

In the empathy dimension, there was a positive perception of care with individualized attention to patients, although a gap was identified in the openness to listen to patients' complaints and suggestions, as well as in the adaptation of healthcare measures according to patients' needs during the pandemic. These results highlight the importance of a more empathetic and personalized approach by healthcare professionals to ensure patient satisfaction and trust.

With regard to safety, the results showed a lack of patient confidence in the transmission of safety during the pandemic, in the safety of healthcare transactions and procedures, as well as in the availability of technical knowledge on the part of healthcare professionals to answer patients' questions and concerns about Covid-19. These gaps highlight the need for additional measures to ensure patient safety and the effectiveness of health services during public health crises.

Finally, in the tangibility dimension, gaps were identified between patients' expectations and perceptions in relation to the physical elements of health services, such as the availability of modern equipment and instruments, visually appealing facilities, staff presentation and convenient opening hours. These results highlight the importance of investments in infrastructure and physical resources to improve the quality and effectiveness of public health services during health crises.

Therefore, it can be concluded that the results of this research highlight the need for improvements in various areas of public health services in Três Rios/RJ during the Covid-19 pandemic, in order to adequately meet patients' expectations and needs. As for the limitations of this study, it is worth highlighting the focus on a single city, which may limit the generalization of the results to other locations. In addition, the quantitative approach adopted may not fully capture the complexity of users' experiences of health services. It is therefore recommended that future research consider qualitative approaches to explore users' perceptions and experiences in greater depth.

REFERENCES

- AAKER, D. A.; KUMAR, V.; DAY, G. S. **Marketing research**. São Paulo: Atlas, 2004.
- ARAÚJO, L. D. et al. **Bibliographic research, search strategies and sources of information, concepts and approaches**. Rio de Janeiro: Fiocruz/ICICT, 2020.
- BAÓ, A. C. P. et al. Quality indicators: tools for managing good health practices. **Revista Brasileira de Enfermagem**, v. 72, n. 2, p. 461-468, Mar.-Apr. 2019.
- CALDEIRA, A. C. G. **Evaluation of the quality of health services through the SERVQUAL model**. 85f. 2019. Master's dissertation (Master in Service and Technology Management) - University Institute of Lisbon, 2019.
- CAMPIOLO, E. L. et al. Impact of the COVID-19 pandemic on the Health Service: a review of the COVID-19 literature. **InterAm J Med Health**, 3:e202003046, 2020.
- CONASS. Coronavirus (Covid-19) - **Information is the best ally for health professionals, managers and the general population**. 2022. Available at: <https://www.conass.org.br/coronavirus/>. Accessed on February 2, 2023.
- CRUZ, C. P. R.; MELO, F. J. C.; SOBRAL, E. F. M. Use of Servqual to evaluate the quality of services provided in UBS. **Revista Exacta**, 2022.
- FERREIRA, C. A. L. Quantitative and qualitative research: perspectives for the field of education. **Revista Mosaico**, v. 8, n. 2, p. 173-182, jul./dez. 2015.
- FROES, D. F. The SARS-CoV-2 pandemic: origin, inevitability and what we need to learn. **Revista Militar**, n. 6/7, June/July, pp. 583-589, 2020.
- GALDINO, S. V. et al. Quality tools in health services management: integrative literature review. **Revista Eletrônica Gestão & Saúde**, v. 7, n. 1, 2016.
- GIL, A. C. **Como Elaborar Projetos de Pesquisa**. 4. ed. São Paulo: Editora Atlas, 2002.
- IBGE. **Population - Três Rios/RJ**. 2020. Available at: <https://cidades.ibge.gov.br/brasil/rj/tres-rios/panorama>. Accessed on May 12, 2023.
- MALHOTRA, N. K. **Marketing Research**. 3rd ed. São Paulo: Bookman Publishing, 2001.

- MATTAR, F. N. **Pesquisa de marketing**. 3rd ed. São Paulo: Atlas, 2001.
- MINEIRO, M. Survey research and sampling: elementary theoretical contributions. **Revista De Estudos Em Educação E Diversidade - REED**, 1(2), 284-306, v. 1, n. 2, 2020.
- NAZARIO, M. P. S. et al. Evaluation of the Satisfaction of Hospitalized Patients in Relation to Physiotherapeutic Care. **J Health Sci**, 20(3):200-4, 2018.
- OLIVEIRA, A. E. F. de; REIS, R. S. **Public health management: the challenges of health evaluation**. São Luís: Edufma, 2016.
- PARASURAMAN, A.; ZEITHAML, V. A.; BERRY, L. L. SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. **Journal of Retailing**, vol. 64, nº 1, p.12-40, New York University, Spring 1988.
- PRODANOV, C. C.; FREITAS, E. C. **Metodologia do trabalho científico: métodos e técnicas da pesquisa e do trabalho acadêmico**. Novo Hamburgo, RS: Feevale, 2013.
- RODRIGUES, N. H.; SILVA, L. G. A. Coronaviruspandemic management in a hospital: professional experience report. Pelotas: **J. nurs. health.(n.esp.):e20104004**, 2020.
- SAMPIERI, R. H.; COLLADO, C. F.; LUCIO, M. D. P. B. **Researchmethodology**. 5 ed. Porto Alegre-RS: Penso publishinghouse, 2013.
- VERGARA, S. C. **Research projects and reports in administration**. 3.ed. Rio de Janeiro: Atlas, 2000.

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