

Assessment of satisfaction and resolvability of the Telehealth Network Platform in the state of Pará, Brazil

Avaliação da satisfação e resolubilidade da plataforma telessaúde redes no estado do Pará, Brasil
Evaluación de satisfacción y resolubilidad de la plataforma telesalud en el estado de Pará, Brasil

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Abstract

Introduction: Information technologies have modernized several branches of human activity, including medicine. In this context, telemedicine emerges as an advance in communication technologies applied to medicine. In Brazil, Telehealth is a telemedicine tool in service of public health, and its purpose is to improve the resolvability of Primary Health Care. In the state of Pará, north of Brazil, the Telehealth platform provides assistance to the 144 municipalities in the state. **Objective:** To assess the resolvability of cases forwarded by teleconsultation and the satisfaction of requesting professionals with the Pará Telehealth Network Center, from the years of 2015 to 2019. **Methods:** An observational, cross-sectional and quantitative study of a historical series was carried out, in which the Telehealth Platform was consulted to verify data on resolvability, professionals' satisfaction, and service usage status based on questions automatically generated on the platform. **Results:** Over the years, resolvability ranged between 45.6% and 70% of avoided referrals to other services, proving to be slightly variable. The satisfaction of professionals/platform users was high, ranging from 77.9% to 95.45 %, with most requesters being "satisfied" or "very satisfied" with the service. **Conclusions:** The data suggest the relevance of the program in terms of Primary Health Care support, producing different effects on public health.

Keywords: Telemedicine. Telemonitoring. Primary health care.

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Resumo

Introdução: As tecnologias da informação modernizaram diversos ramos de atuação humana, inclusive a medicina. Nesse contexto, surge a telemedicina como um avanço das tecnologias de comunicação aplicadas nessa área. No Brasil, o Telessaúde é uma ferramenta da telemedicina a serviço da saúde pública e funciona com o propósito de elevar a resolubilidade da Atenção Primária à Saúde (APS). No Pará, Norte do Brasil, o núcleo Telessaúde presta assistência aos 144 municípios do estado. **Objetivo:** Avaliar a resolubilidade dos casos enviados por teleconsultorias e a satisfação dos profissionais solicitantes no Telessaúde Redes Núcleo Pará, de 2015 a 2019. **Métodos:** Foi realizado um estudo observacional, transversal e quantitativo de série histórica, no qual se consultou a plataforma Telessaúde para verificação dos dados sobre resolubilidade, satisfação profissional e *status* de utilização do serviço, com base em perguntas geradas automaticamente na plataforma. **Resultados:** Verificou-se que a resolubilidade variou ao longo dos anos com 45,6 a 70% de encaminhamentos evitados, demonstrando-se relativamente pouco variável. Já a satisfação dos profissionais usuários demonstrou-se elevada, variando de 77,9 a 95,45%, estando os solicitantes majoritariamente “satisfeitos” ou “muito satisfeitos” com o serviço. **Conclusões:** Os dados sugerem a relevância do programa no que tange ao apoio à APS, com efeitos diversos na saúde pública.

Palavras-chave: Telemedicina. Telemonitoramento. Atenção primária à saúde.

Resumen

Introducción: Las tecnologías de la información han modernizado varias ramas de la actividad humana, incluida la medicina. En este contexto, la telemedicina surge como un avance en las tecnologías de comunicación aplicadas en medicina. En Brasil, Telehealth es una herramienta de telemedicina al servicio de la salud pública, y trabaja con el propósito de aumentar la resolución de la Atención Primaria de Salud (APS). En Pará, norte de Brasil, el centro de Telesalud brinda asistencia a los 144 municipios del estado. **Objetivo:** Evaluar la resolución de casos enviados por teleconsulta y la satisfacción de los profesionales solicitantes en Telehealth Redes Núcleo Pará, de 2015 a 2019. **Métodos:** Para esto, se realizó un estudio observacional, transversal y cuantitativo de una serie histórica, que consultó a la plataforma de telesalud para verificar los datos sobre resolubilidad, satisfacción laboral y estado de uso del servicio, en base a preguntas generadas automáticamente en la plataforma. **Resultados:** Se encontró que la resolubilidad varió a lo largo de los años entre el 45,6% y el 70% de las derivaciones evitadas, demostrando ser relativamente poco variable a lo largo de los años, ya que la satisfacción de los usuarios profesionales fue alta, variando de 77,9% a 95,45%, y la mayoría de los solicitantes están “satisfechos” o “muy satisfechos” con el servicio. **Conclusiones:** Los datos sugiere la relevancia del programa en términos de apoyo de APS y con diferentes efectos sobre la salud pública.

Palavras-clave: Telemedicina. Telemonitorización. Atención primaria de salud.

INTRODUCTION

The Alma Ata Primary Healthcare Conference transformed health systems throughout the world by advocating primary health care as the gateway to health care.¹ In Brazil, the VIII National Health Conference² held in 1986 consolidated the modality of access to health by the Primary Health Care (PHC), in the Brazilian Constitution, and by the Law 8080/90, with the format of the Brazilian Unified Health System (SUS).

Technological development has greatly contributed to advances in health, not only with regard to the production of new medications and treatment possibilities, but also concerning the dissemination of information and its impacts on the health/disease process.³

In this context, telemedicine emerges as an assistance and continuing education tool for healthcare professionals.^{4,5} In Brazil, *Telessaúde* Program (Portuguese term for “Telehealth,” as it is referred throughout the article) is one of the telemedicine tools. It is used in public health and has a non-profit online platform for large companies, as it consists in a Federal Government initiative to improve public health in the State. Therefore, Telehealth is an assistive technology tool that supports healthcare practices with the use of telemedicine, and which was regulated by several laws until the creation of *Programa Telessaúde Brasil Redes* [National Telehealth Network Program in Brazil].⁶⁻⁸

Its main objective is to expand the resolvability of SUS and reduce inequality in access to health, increasing agility and reducing the transportation costs of patients at the PHC level. To do so,

activities of teleconsultation, tele-education, and telediagnosis are carried out through the Telehealth Platform (in Portuguese, *Plataforma Telessaúde*). All these care modalities are deemed instruments to offer a formative second opinion on more complex cases, which usually require the care of a specialist physician.^{9,10} Thus, the alliance between medicine and communication technology promoted by Telehealth is considered an artifact to support interventions of drug and non-drug treatment options and doubts about clinical signs and complementary exams, in such a way to allow access to several services of different specialties.¹¹

Although telemedicine divides opinions in Brazil regarding its use, it is relevant to research the impact of the Telehealth Platform on Brazilian public health, especially in the Amazon context, in which worrying indicators of development and health can be observed, in addition to the small number of professionals working in assistance. This can lead to difficulty in accessing health services, emphasizing specialized care. The geographic dimensions of the region partly justify the difficult access to healthcare programs and, therefore, the use of Telehealth can become a possibility for professional improvement or support for working professionals, expanding the population's access to health, which can impact the resolvability of the primary health system.¹²

Thus, the objective of this article is to analyze the resolvability achieved by the requested consultations, the satisfaction of requesting professionals, and the status of use of the Telehealth Platform regarding the responses to cases requested on the platform.

METHODS

Study design

This is an observational, cross-sectional, and quantitative study of a historical series that used information from the database of the Telehealth Network Center of the state of Pará, Brazil.

Study location

This research was carried out at the headquarters of the Pará Telehealth Network Center, located at Universidade do Estado do Pará, Center of Biological and Health Sciences, on February 2020, and used information on the period between January 1st, 2015 and December 31, 2019 for teleconsultations carried out in the state of Pará. Data collected from the Telehealth Platform of the state of Rio Grande do Sul were analyzed in this study, considering that this is the platform used by the Pará Telehealth Network Center.

Inclusion and exclusion criteria

All teleconsultations requested from 2015 to 2019 were analyzed; those that presented data on resolvability and professionals' satisfaction in the years established for the survey were considered. Therefore, teleconsultations in which the researched data were not filled in, those that were not carried out in the established period, and those that were canceled by the system regulators or by the requesting professionals were excluded.

Proposed methodology

In the present study, data on resolvability specifically refer to the non-referral of primary care patients to another level of complexity, thus avoiding referrals to services of higher levels of complexity. Therefore, the teleconsultation was considered resolute when completing the assistance service while still in the PHC, without referring the patient.

Data were collected by the automatic question presented in the Telehealth platform system after the teleconsultation professional's answer, "Did the teleconsultation avoid referral?", which can be answered through the automatic options "yes" or "no." As for satisfaction, after reading the answer given by the specialist doctor concerning the case report, the platform asks: "are you satisfied with the answer provided by teleconsultation?" and offers the options "very satisfied," "satisfied," "indifferent," "dissatisfied," and "very dissatisfied" to health professionals who requested support from the Pará Telehealth Network Center.

Data analysis

The analysis was performed with raw data obtained from tables automatically compiled by the Telehealth platform. These data originate from medical assistance services to the population throughout the state of Pará, as it seeks to assess the relevance of the program throughout the state. Descriptive data analysis was performed, expressed as raw numbers, percentage and dispersion measures.

Ethical aspects

This research followed the standards of Resolution 466/12 of the National Health Council, Brazilian Ministry of Health, which deals with research involving human beings. By dispensing with the signing of the Informed Consent Form, the Data Use Commitment Term was used for data collection.

The project was submitted to the Research Ethics Committee located at Universidade do Estado do Pará and it was approved according to opinion number 2.951.049.

RESULTS

From 2015 to 2019, the assistance provided by Pará Telehealth Network Center reached 1,969 teleconsultations. However, only 926 teleconsultations had data on the number of referrals indicated throughout the state, whereas 1,232 had data on the requesting professionals' satisfaction in relation to the teleconsultation professional's response.

This discrepancy between data is mainly due to the fact that it is not mandatory to provide these two data on the Telehealth platform. Thus, according to the exclusion criteria, the universe of the study consisted in a total of 1,232 teleconsultations evaluated only for satisfaction data and 926 evaluated for referral data.

In the present study, resolvability is characterized by the ability to avoid referral to a higher level of care and complexity, as the service is able to tackle and resolve the health condition while still in PHC. In Table 1 the resolvability data are presented, indicating the absolute number and percentage of performed or avoided referrals to other levels of complexity after the teleconsultation professional's response, according to year. There was a slight increase in referrals over the four years evaluated.

Table 1. Absolute number and percentages of referrals avoided and performed after the response of the teleconsultations analyzed by Pará Telehealth Network Center in the years 2015 to 2019.

Referral	2015		2016		2017		2018		2019	
	n	%	n	%	n	%	n	%	n	%
Avoided	35	70	154	59.9	144	29.9	89	65.44	21	45.6
Performed	15	30	103	40.1	339	70.1	47	34.56	25	54.4
N/A	53	–	675	–	188	–	56	–	25	–
Total	103	100	932	100	671	100	192	100	71	100

Source: Pará Telehealth Network Center; 2020. n: number of teleconsultations; %: percentage; N/A: not applicable.

Regarding the satisfaction of the requesting professional as for the responses obtained through teleconsultations, in Table 2 the responses are stratified into “very satisfied,” “satisfied,” “indifferent,” “dissatisfied,” and “very dissatisfied.” Similar rates for satisfaction were observed over the years, except 2019, when there was a sharp decrease.

Table 2. Professionals’ satisfaction in absolute number and percentage regarding the responses of teleconsultations carried out by Pará Telehealth Network Center in the years 2015 to 2019.

Satisfaction level	2015		2016		2017		2018		2019	
	n	%	n	%	n	%	n	%	n	%
Very dissatisfied	0	0	11	1.9	8	1.7	2	1.8	2	5.5
Dissatisfied	1	2.32	12	2.1	16	3.45	3	2.75	2	5.5
Indifferent	1	2.32	9	1.5	16	3.45	0	0	4	11.1
Satisfied	14	32.56	252	43.6	235	50.4	43	39.45	12	33.4
Very satisfied	27	62.8	294	50.9	191	41	61	56	16	44.5
N/A	60	–	354	–	205	–	83	–	35	–
Total	103	100	932	100	671	100	192	100	71	100

Source: Pará Telehealth Network Center; 2020. n: number of teleconsultations; %: percentage; N/A: not applicable.

The use of the Telehealth Platform over the years is shown in Table 3. Over the years, the number of Primary Health Units (*Unidades Básica de Saúde* – UBS) that requested teleconsultation in the Telehealth Platform can be verified. The following units were stratified over the years as follows: those that presented less than 12 teleconsultations per year, a number considered below the standard; between 12 and 36 teleconsultations per year, a number considered as the average; and over 36 teleconsultations per year.

Table 3. Use of the Telehealth Platform, according to the surveyed years, indicating the average use per Primary Health Units in raw numbers.

Use	2015	2016	2017	2018	2019
Number of UBS with <12 teleconsultations	52	268	104	67	38
Number of UBS with 12 to 36 teleconsultations	1	6	8	0	0
Number of UBS with >36 teleconsultations	0	1	2	2	0
Total	53	275	114	68	38

Source: Pará Telehealth Network Center; 2020. UBS: Primary Health Units.

DISCUSSION

Synthesis of the main findings

In this study, the resolvability of assistance via teleconsultation and professionals' satisfaction with the received answers were evaluated through the automatic question generated in the teleconsultations carried out in the state of Pará, namely: "did the teleconsultation avoid referral?" The question could be answered by the automatic options "yes" or "no." A variable resolvability was observed from 45.6 to 70% between the years 2015 to 2019, a period in which it was possible to observe a decrease in resolvability percentages in 2016, 2017 and 2019, accentuated in 2017.

After reading the answer given by the specialist physician concerning the case report, the platform asks the requesting professional: "are you satisfied with the answer provided by teleconsultation?", offering the options "very satisfied," "satisfied," "indifferent," "dissatisfied," and "very dissatisfied." As for satisfaction, there were high averages over the years 2015 to 2018, but with a decrease in 2019, which coincides with the reduced resolvability and the lowest levels of satisfaction in 2019.

Moreover, the authors verified the average usage according to the number of requests made on the Telehealth Platform, and there was a reduction in the number of UBS that requested teleconsultations, as well as the frequent use below 12 teleconsultations per UBS.

Comparison with existing literature

According to the Pan American Health Organization,¹³ PHC should be the gateway to health care; therefore, it must provide longitudinal and comprehensive care to the population.¹⁴ In order to offer assistance to PHC, the National Telehealth Network Program in Brazil has been expanding since 2007 in the country, despite discussions about its formalization among physicians.¹⁵ This study analyzed the resolvability of the program and the satisfaction of professionals/platform users in the state of Pará.

According to the SUS, resolvability is defined as the ability of the health service to tackle and solve a problem according to its level of competence, thus avoiding unnecessary referrals to other levels of complexity, which in this article is explained through the number of referrals indicated after the answer from the teleconsultation.

However, it is noteworthy that the referral to a new level of complexity does not necessarily mean that the teleconsultation assistance in the PHC has not been resolute, considering that the raw data do not allow identifying whether the referral was unnecessary or not. Therefore, it is inferred that teleconsultation enabled to verify that the clinical case in question could not be solved yet in the PHC and, thus, a face-to-face appointment with a specialist was necessary.

Conversely, satisfaction is exclusively evidenced by satisfaction of the requesting professional regarding the information received from the Telehealth platform. Both the need for referral to another level of complexity and satisfaction are assessed by automatic questions generated by the platform.^{16,17}

Telehealth enables to remotely offer specialized health care to the population, favoring a greater possibility of exchange and the acquisition of new knowledge between requesting professionals and specialists located in the state capital.¹⁸ First, the platform provides that the face-to-face appointment is carried out by a healthcare professional working at the UBS and, in case of doubts about the diagnosis or need for a second professional opinion, usually when specialized care is required, it has specialized professionals to assist the UBS teams, in direct contact with the population through teleconsultation.

For organizational control purposes, the Brazilian Ministry of Health established an average of teleconsultations per UBS from one to three monthly requests, but the demand of professionals in Brazil for the Telehealth service is deemed low. This situation is intensified in the state of Pará, where, despite all municipalities being registered in the program, almost half of the requests for the service come from a few registered cities. The present study demonstrates the underutilization of the service, corroborating studies that found that clinicians prefer to refer patients to other levels of care and that, despite the considerable number of registrations on the platform, the number of forwarded teleconsultations is significantly lower.^{18,19}

It is worth emphasizing that several aspects impact the underutilization of the service, including the difficulty in accessing the internet.^{8,20} According to Fernandes,²¹ connectivity in Brazil is a major obstacle for the performance of distance consultations, as several Brazilian regions have slow internet of poor performance, an obstacle highlighted by healthcare professionals. In the north region, although there are improvements, there are important limitations in the speed of connectivity and a higher rate of urban use in relation to the rural one.²⁰ However, new technologies require a minimum technological support from the areas served in such a way they can properly function.

Several telehealth centers in Brazil have also shown that simply offering teleconsultation is not enough to increase the use of the service on the part of healthcare professionals, according to the study conducted by Maeyama e Calvo,²² considering some resistance to its use by these professionals. The aforementioned study also discusses the possibility of making the use of Telehealth mandatory, depending on the management of the UBS, as the resolvability of PHC remains low. This can be related to the current lack of structure and also to the use of unnecessary referrals to more complex levels, as these demands could be met even in PHC services.

In the case of mandatory use, the obligation of the flow of teleconsultations would take place only before the UBS physician refers the patient to a higher level of complexity, that is, the teleconsultation could guide the actual need for referral. Nevertheless, the PHC physician is responsible for making the final decision, having teleconsultation solely as a tool to assist the requesting physician.²²

The reduced use of the platform can also be attributed to the discreet public investment in telemedicine in the SUS, both with regard to the dissemination of the service and to professional clarification as to the purpose of the platform. The platform often requires the benefits of its use in public health to be elucidated; these benefits are mainly related to aid in continuing education and to the impact on resolvability by avoiding unnecessary referrals, generating a positive impact on the economy of public treasury and saving funds for referrals.²³⁻²⁵ However, when considering that the care provided in remote regions and without structure limits the medical practice, the referral to other levels of complexity becomes inevitable, which leads to a reduction in the resolvability in PHC. This fact is corroborated by the present findings, according to which the relative resolvability of the requested teleconsultations is verified, as evidenced in the Pará Telehealth Network Center.

Furthermore, there are difficulties in maintaining a quality service that expands to other regions, as many professionals do not adhere to the Telehealth Program in addition to impediments regarding licensing. Nonetheless, it is worth noting that there was improvement in this area, with a growing number of services, especially abroad.²⁶

Considering the complexity involved in establishing telemedicine, the challenge of determining how it influences the quality of the service is posed.²⁶ According to the literature, its application is successful in addition to avoiding potential hospitalizations.²⁷⁻³⁰

As for satisfaction, despite the limited literature, it must be considered as a topic that can be addressed from several perspectives, such as satisfaction with: the system; the teleconsultation response

based on the requesters' expectations; receiving assistance in critical situations; the accuracy of the diagnosis, among others.³¹ In this study, the objective was to assess satisfaction with the responses of teleconsultations, seeking to evidence whether the requests of primary healthcare physicians were met by evaluating the professionals' satisfaction.

It is noteworthy that teleconsultations whose data did not contain answers on resolvability and satisfaction were excluded. Only teleconsultations that presented data on referral and satisfaction were used. In these data, it was possible to verify similar rates of satisfaction over the years, with users in general very satisfied or satisfied with the answers from the teleconsultations. However, these data do not have a mandatory response on the platform, which can be considered an important limitation of the study, as teleconsultations that were not evaluated were not considered part of the research sample.

Many studies³²⁻³⁶ highlight the ease of disseminating information and the possibility of professional improvement with teleconsultations, emphasizing their value in favoring continuing health education through a dialectical process of learning and bringing benefits to both users and working professionals. This is because the digital environment brings health professionals closer and favors patients, who will benefit from the knowledge and clinical practice of other professionals, regardless of distance.³³

Thus, Telehealth connects health services, reference centers, and renowned universities, which enables the permanent education of professionals and managers, avoiding unnecessary transportations and offering support for taking action.

Another crucial point for the operation of Telehealth is the professional insecurity regarding users' data. Rezende et al.³⁷ state that the information system must have restricted and limited access mechanisms for each user profile, an aspect that must be taken into account to maintain the privacy and confidentiality of the information in progress in Telehealth. An efficient security system generates adequate restriction of data to authorized people, or even only allows disclosing private information of users and patients who have previously accepted that certain data be exposed to other professionals through the platform.

Study strengths and limitations

Nevertheless, all in all, Telehealth has some weaknesses in its performance, as the data selected for analysis in the study come from automatic questions generated by the system and which do not have a mandatory answer, thus reducing the number of teleconsultations evaluated.

Furthermore, the use of raw data alone is an important limitation, as raw data do not reliably indicate the reason for referral.

The sharp drop in the use of the service over the years can also be an important limiting factor, as this decrease coincides with the withdrawal of Cuban doctors from assistance in PHC. It can be assumed that this fact is a possible cause for the reduction in requests over the years, which, however, would not fully explain the reduction in use.

Taking into account that providing data on the need for referral and satisfaction is not mandatory, the authors also highlight this situation as an important limitation, considering that teleconsultations in which the level of satisfaction of the requesting professional could not be inferred were disregarded.

Another limiting aspect is the reduced investment and dissemination of information on the topic of telemedicine nowadays, which makes adherence and the possibility of exchanging knowledge between professionals difficult. According to Cunha,³⁴ in order to have an efficient permanent education process, it is necessary to constantly train the involved professionals, in addition to the continuous renewal of the

available content. The Pan American Health Organization³⁸ corroborates this statement, pointing out as a challenge to raise the awareness of managers on the importance and need for investment in PHC.³⁹⁻⁴²

However, despite the limitations presented in terms of adherence, data were collected from about 1,232 teleconsultations over five years of Telehealth services in the state of Pará.

Implications for research in the area and/or practice of professionals

This article presents for the first time data on resolvability and professionals' satisfaction from the Pará Telehealth Network Center and points to the need for greater exploration of data involving more studies on telemedicine and public health in the Amazon context.

Another relevant implication is the generation of new knowledge and priorities regarding the use of telemedicine, emphasizing the problem-solving capacity of PHC and the need for further studies on the importance of Telehealth in the context of improvements in public health.

CONCLUSIONS

The Telehealth Platform of the National Telehealth Network Program of the state of Pará was created with the objective of supporting the principles of integrality, equity and universality of the SUS. In its practice, it aims to expand the population's access, reducing users' transportation time and access difficulties through information technologies, mainly by avoiding unnecessary referrals, as many cases could be fully tackled in PHC by minimizing geographic distances.

The present study suggests a relatively stable resolvability with a slight reduction over the years. Likewise, the degree of satisfaction of professionals who use the platform was high, which also suggests the importance of the program in terms of support for primary healthcare professionals and assistance also through continuing education. Nevertheless, the underutilization of the service also proved to be a reality.

Further research in the area must be conducted to have more in-depth data on the impact of the Telehealth program on public health, seeking to understand the needs and weaknesses of the program and to improve it.

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CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

TSSN: Project administration, Formal analysis, Conceptualization, Data curation, Writing – original draft, Writing – review & editing, Investigation, Methodology. MAG: Data curation, Writing – original draft, Writing – review & editing, Investigation. PSD: Data curation, Writing – original draft, Investigation. PYCC: Data curation, Writing – original draft, Investigation. POB: Data curation, Writing – original draft, Investigation. ACCM: Project administration, Supervision. NBG: Project Administration, Formal Analysis, Supervision.

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