Implementation of Teleconsultations in a University Hospital

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Abstract

Introdution: The COVID-19 pandemic has accelerated the adoption of digital health innova-tions, such as telehealth, in Brazil. Law No. 14,510/2022 regulates these practices, ensuring data security and integration with the Unified Health System (SUS). **Objective:** This study evaluated the implementation of teleconsultations at the University Hospital of the Federal Uni-versity of São Carlos between 2020 and 2024, focusing on patient satisfaction. **Methods:** To describe the implementation of the outpatient teleconsultation, carried out in stages, and to eval-uate user satisfaction regarding the quality of care, the performance of professionals, and meet-ing their needs, through a form sent via WhatsApp. **Results**: Between 2023 and 2024, 234 tele-consultations were carried out in 12 specialties, of which 97 resulted in valid answers about satisfaction, with an average of 9.54. The data show benefits such as reduced travel and conti-nuity of care, despite technical challenges and limitations of remote healthcare. **Conclusion**: The study concludes that telehealth has the potential to expand access to health services and improve the quality of care, recommending the expansion of this modality to other specialties and university hospitals, with technical support and ongoing training for professionals.

Key-words: Telehealth, Teleconsultation, Digital Health, Remote consultation, Patient assistance, Satisfac-tion analysis, Unified Health System.

Resumen

Implementación de Teleconsultas en un Hospital Universitario

Introducción: La pandemia de Covid-19 aceleró la adopción de innovaciones en Salud Digital, como la telesalud, en Brasil. La Ley nº 14.510/2022 regula estas prácticas, garantizando la se-guridad de los datos y la integración con el Sistema Único de Salud (SUS). **Objetivo**: Este es-tudio evaluó la implementación de teleconsultas en el Hospital Universitario de la Universidad Federal de São Carlos entre 2020 y 2024, centrándose en la satisfacción del paciente. **Metodos**: Describir la implementación del modelo de teleconsulta ambulatoria, realizada por etapas, y evaluar la satisfacción de los usuarios en cuanto a la calidad de la atención, el desempeño de los profesionales y la satisfacción de sus necesidades, a través de un formulario enviado por WhatsApp. **Resultados**: Entre 2023 y 2024 se realizaron 234 teleconsultas en 12 especialida-des, de las cuales 97 resultaron en respuestas válidas sobre satisfacción, con un promedio de 9,54. Los datos muestran beneficios como la reducción de los viajes y la continuidad de la aten-ción, a pesar de los desafíos técnicos y las limitaciones del formato remoto. **Conclusión**: El es-tudio concluye que la telesalud tiene el potencial de ampliar el acceso a los servicios de salud y mejorar la calidad de la atención, recomendando la expansión de esta modalidad a otras especia-lidades y hospitales universitarios, con apoyo técnico y capacitación continua a los profesiona-les.

Palabras clave: Telesalud, Teleconsulta, Salud Digital, Consulta remota, Asistencia al paciente, Análisis de satis-facción, Sistema Único de Salud.

Resumo

Implementação de Teleconsultas em um Hospital Universitário

Introdução: A pandemia de Covid-19 acelerou a adoção de inovações em Saúde Digital, como a telessaúde, no Brasil. A Lei nº 14.510/2022 regulamenta essas práticas, visando garantir a se-gurança dos dados e a integração ao Sistema Único de Saúde (SUS). **Objetivo**: Este estudo avaliou a implementação de teleconsultas no Hospital Universitário da Universidade Federal de São Carlos entre 2020 e 2024. **Métodos**: Descrever a implantação do modelo de teleconsultas ambulatoriais, realizada em etapas e avaliar a satisfação dos usuários quanto à qualidade do atendimento, atuação dos profissionais e ao atendimento de suas necessidades, por meio de for-mulário enviado via WhatsApp. **Resultados:** Entre 2023 e 2024, foram realizadas 234 telecon-sultas em 12 especialidades, das quais 97 resultaram em respostas válidas sobre satisfação, com média de 9,54. Os dados evidenciam benefícios como a redução de deslocamentos e continui-dade do cuidado, apesar de desafios técnicos e limitações do formato remoto. **Conclusão**: A telessaúde tem potencial para ampliar o acesso aos serviços de saúde e melhorar a qualidade do atendimento, recomendando a expansão dessa modalidade para outras especialidades e hospitais universitários, com suporte técnico e capacitação continuada para os profissionais.

Palavras-chave: Telessaúde, Teleconsulta, Saúde Digital, Consulta remota, Assistência ao paciente, Análise de satisfação, Sistema Único de Saúde.

INTRODUCTION

The COVID-19 pandemic has prompted significant reflection and movement within the realm of Digital Health, both in Brazil and worldwide. The crisis has accelerated the adoption of innovations such as artificial intelligence and telehealth, which are now authorized and regulated in Brazil under Law No. 14,510, enacted on December 27, 2022[1].

Discussions surrounding the potential and challenges of telehealth have been extensive, leading to the sharing of strategies aimed at ensuring its implementation aligns with the principles and guidelines of the Unified Health System (SUS)[2]. Additionally, this alignment must adhere to current legislation, including the General Data Protection Law (LGPD – *Lei Geral de Proteção de Dados*). Such regulations are crucial for guaranteeing the appropriate handling of data for both healthcare professionals and patients involved in this evolving landscape, relying on operational and organizational measures[2-3].

For the SUS, telehealth initiatives, such as teleconsultations, are endorsed as strategies for reducing waiting times for specialized care, promoting care for conditions such as complications from COVID-19, or even for production efficiency, even in adverse financial circumstances[2].

Telehealth has been established as an essential strategy for expanding access to health services and improving the quality of care, especially in university hospitals[4], where the implementation of new technologies presents challenges that require creative solutions.

This study aimed to describe and systematize the steps involved in implementing teleconsultation at the University Hospital of the Federal University of São Carlos (HU-UFSCar). The project focused on structuring the service, which included careful planning, workflow organization, the identification of necessary technological resources, and team training. Assessing patient satisfaction was also regarded as a crucial step in the process, intended to support continuous improvements and aid in the consolidation of this modality. Furthermore, the study highlights the strategies employed and the results achieved thus far, showcasing teleconsultation as a viable practice integrated into healthcare within the hospital setting.

METHODOLOGY

This is a descriptive study conducted at the HU-UFSCar outpatient clinic, where services are provided entirely through the Unified Health System (SUS). Data collection took place between 2020 and 2024, after approval by the Human Research Ethics Committee (CAAE 74258023.3.0000.5504).

The implementation of teleconsultation was structured in strategic stages to ensure the effectiveness of the process, as described below:

1) Process Mapping: The first step consisted of a detailed identification of the workflows and responsibilities assigned to the professionals involved, including the scheduling team, professionals interested in adopting teleconsultations, and the necessary technical support.

2) Staff Awareness Raising and Engagement: Actions aimed at mobilizing professionals were promoted, aiming for understanding and adherence to the service modality. Highlights included discussion groups, active listening, sharing successful experiences from other services, and presenting data demonstrating the positive impact of telehealth initiatives.

3) Technical Training: Specific training was provided on the use of the Telehealth and Telemedicine System, the Management Application for University Hospitals (STT-AGHUx) for remote care, and best practices in teleconsultations. The training was directed at the clinical staff (doctors, nurses, gerontologists, and nutritionists) and the team responsible for scheduling.

4) Guidelines on regulatory compliance:

. Instructions for submitting medical documents digitally were available through the Federal Council of Medicine (CFM-*Conselho Federal de Medicina*) platform, ensuring that the entire patient journey could be completed digitally, promoting convenience and reducing the need for patients to travel to the facility to retrieve physical documents.

. Also, current resolutions and regulations were presented to professionals already working in teleconsultations at the facility, as well as updates to this content in training courses that migrated

from in-person to remote (via HU-UFSCar's Moodle), providing flexible access for those interested in this modality.

5) Process monitoring: To support continuous improvements, a patient satisfaction survey was made available, allowing patients to evaluate the service, the professional, and the degree to which their needs were met on a scale of 0 to 10—the closer to 10, the higher the satisfaction. The number of teleconsultations scheduled and completed by specialty was also monitored on a monthly basis.

This service began with two specialties—gerontology and neurology—and currently offers teleconsultation services in twelve specialties: neurology, general internal medicine, pediatrics, obstetrics and diabetes, otolaryngology, psychiatry, nutrition, nursing, geriatrics, gerontology, adolescent medicine, and interprofessional care.

From 2020 to early 2023, teleconsultations were conducted using Microsoft Teams and WhatsApp Business. In mid-2023, the Telehealth and Telemedicine System was integrated with the Management Application for University Hospitals (STT-AGHUx), which expanded teleconsultations to include videoconferencing for remote patient care. This advancement enhanced care workflows while ensuring compliance with the General Data Protection Law (LGPD), thereby promoting greater security in processes. Targeted training was provided for healthcare professionals—including doctors, nurses, nutritionists, and gerontologists—as well as administrative staff responsible for scheduling and healthcare students, emphasizing best practices for utilizing technological tools effectively.

To collect data on patient satisfaction, an electronic form was sent via instant message after the teleconsultation, accompanied by an invitation emphasizing the importance of their participation.

The patient, or their representative, was requested to complete the form with personal information (for potential contact, if needed) and to rate the following aspects on a scale from 0 to 10: 1) the type of online care provided; 2) the professionalism of the individual who conducted the teleconsultation; and 3) the extent to which the patient's needs were met. A score closer to 10 indicates higher satisfaction. The form also included an open field for any additional comments the respondent wished to provide. To maintain anonymity, each form was identified with the letter "A" followed by a number that reflects the chronological order of the responses received.

The form was submitted in a single session, within 72 hours of the teleconsultation, by the e-Health Unit team, responsible for implementing, monitoring, and providing technical support for both professionals and patients.

The inclusion criteria were: having an electronic device with internet access to conduct the teleconsultation and receiving an invitation to participate in the satisfaction survey, ensuring that the respondent was the patient themselves, their caregiver, or legal guardian. Also, participants were required to sign an Informed Consent Form (ICF).

To characterize the population served by this modality, in addition to the information obtained through the form, data from the electronic medical record (AGHUx) were extracted, such as age, gender, and the health condition that prompted the teleconsultation.

Data analysis was performed using the frequency of categorical variables—absolute (n) and relative (%)—and descriptive statistics for numerical variables, calculating mean, standard deviation, minimum, and maximum values. Microsoft Power BI and Microsoft Excel software were used for this purpose.

RESULTS

The following are the results of the implementation of outpatient teleconsultations at HU-UFSCar, including the number of consultations by specialty, the growth observed over the analyzed period, and user satisfaction data, which reflect the effectiveness of the adopted strategy.

Monitoring of the HU-UFSCar teleconsultation process highlighted the importance of coordination between different departments—outpatient reception, information technology, outpatient clinic, and healthcare management—as a key factor in aligning demands and integrating processes.

The implementation of teleconsultations at HU-UFSCar began in 2020, driven by the COVID-19 pandemic. The number of teleconsultations conducted per year since then can be seen in Graph 1.

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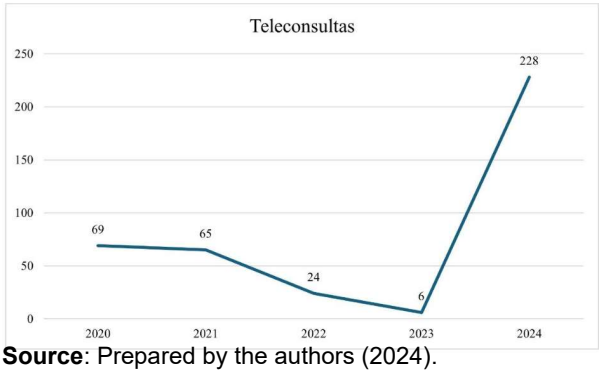
Grpah 1 – Number of teleconsultations per year, between 2020 and 2024.



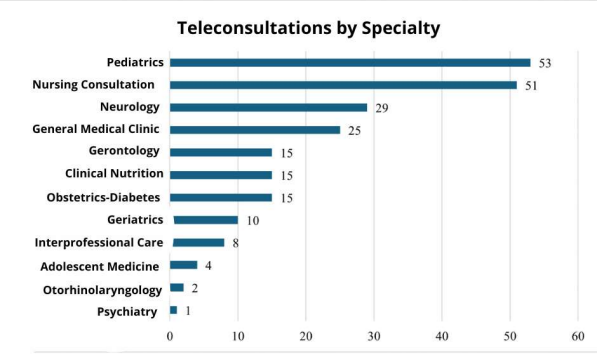
Source: Prepared by the authors (2024).

Until early 2023, teleconsultations were performed in an inconsistent manner, primarily utilizing platforms like Microsoft Teams and WhatsApp Business. This absence of an institutional solution hindered the standardization of workflows, compromising both information security and compliance with existing regulations. The introduction of the Telehealth and Telemedicine System integrated with the Management Application for University Hospitals (STT-AGHUx) marked a significant advancement, offering a secure, legally compliant platform that aligns with Professional Council guidelines. Consequently, consultations are now conducted via videoconference in a more structured and efficient manner.

In 2024, based on the positive results of the pilot project and the expansion of the offer of teleconsultations across 12 specialties, including Geriatrics, Internal Medicine, Pediatrics, Geriatric Psychiatry, Obstetrics-Diabetes, Nutrition, Nursing, among others, it demonstrated rapid and significant growth resulting in 234 teleconsultations being carried out in the period, reflecting not only the expansion of installed capacity, but also the growing adherence and confidence of health professionals and patients in the remote care modality.

The distribution of teleconsultations by specialty can be seen in Graph 2.

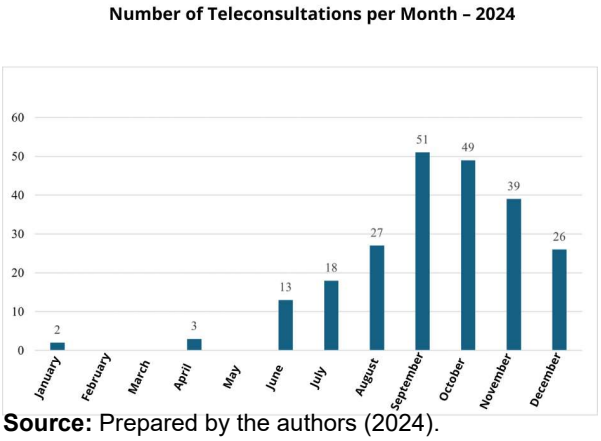
Graph 2 – Number of teleconsultations by specialty in 2024.



Source: Prepared by the authors (2024).

Graph 3 shows the distribution of the number of teleconsultations per month in 2024.

Graph 3 – Distribution of the number of teleconsultations per month, in 2024.



Source: Prepared by the authors (2024).

The profile of patients treated via teleconsultation between 2023 and 2024 consisted of 90 males (31.58%) and 144 females (50.53%), with an

average age of 47.8 years (±31.5), ranging from 26 days to 96 years old.
According to the International Statistical Classification of Diseases and Related Health Problems (ICD-10), the main conditions treated included stroke, epilepsy, diabetes mellitus, dementia, asthma, pneumonia, gastroenteritis, and urinary tract infections, highlighting the diversity of cases treated.
Of the 234 teleconsultations recorded in the system (which occurred between 2023 and 2024), 97 generated feedback on satisfaction survey forms. Of these, five were disregarded because they did not authorize the use of the data, resulting in a final sample of 92 responses, as shown in Table

Table 1 – Patient satisfaction with teleconsultations (n=92)

Criterion	Mean (±Standard deviation)	Minimum (0-10)	Maximum (0-10)
Satisfaction with the call center	9.54 (±1.09)	5	10
Satisfaction with the professional	9.85 (±0.65)	5	10
Meeting your needs	9.68 (±0.95)	4	10

Source: Prepared by the authors (2024)

Qualitative comments highlighted technical difficulties during the teleconsultation, such as miscommunication and audio issues: *"The communication was spotty, there was no microphone option to turn on, communication was done via chat"* (A2) and initial adaptation difficulties, making it a challenging experience: *"It was a bit difficult at first"* (A12).

Among the positive aspects, practicality and reduced travel were highlighted: *"The ease of not having to transport the patient to the hospital is a huge help! Plus, the doctor is always very kind and helpful!"* (A6); *"I really liked the teleconsultation because it's much easier and we avoid going to the hospital. Overall, it's very good. I liked it and I highly approve of it"* (A18).

The quality of care was also praised, often compared positively to in-person consultations, as was the reduced exposure to the hospital environment: *"Despite teleconsultation, the quality of care is the same as in-person, with the advantage of not being exposed to the hospital environment. Excellent!!"* (A45); *"Excellent quality and service, just like in-person"* (A16).

Furthermore, one report illustrated satisfaction with the care received and the importance of technical support before teleconsultations: *"I felt immensely well-assisted and cared for. The professional was incredibly capable and kind. The lady who mediated was also great. The service was wonderful and very calm. My mother would be very happy if she were lucid. THANK YOU SO MUCH"* (A28).

Also, teleconsultation was valued as a tool for clarifying doubts and providing reassurance to patients: *"I found this service very important because we often have questions, and it helped me a lot"* (A79).

However, some users highlighted limitations of the model, such as the inability to perform a physical examination, and compared it to in-person care: *"Teleconsultation was great, but it's no substitute for in-person care"* (A26); *"It's great, in-person care allows you to take measurements, and other than that, it's all good for confirming the measurements"* (A70).

In view of the above, the following promising factors were identified for the process: the implementation of Law No. 14510/22[1], the technical support offered by the e-Health Unit for training teleconsultants with an emphasis on the use of STT and good teleconsultation practices; the implementation of a virtual pre-room for patient care for guidance and resolution of technical problems; a private physical space for teleconsultations with the necessary infrastructure; and finally, the use of WhatsApp Business, a tool that is easily accessible to the population and widely used, for sending links and guidance, which

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facilitated communication and promoted greater accessibility to the service.

DISCUSSION

The implementation of the outpatient teleconsultation model at HU-UFSCar showed promising results in terms of user satisfaction and meeting needs, aligning with global trends toward the incorporation of telehealth. The data from this study reinforce the strategic role of telehealth in the reorganization of the healthcare system, contributing to improved quality of care, expanded access, and reduced costs [5,6].

The gains from telehealth initiatives, such as teleconsultations, have brought numerous benefits to both services and users, such as reduced travel, cost-effectiveness, decreased circulation of people in the hospital environment, and the provision of specialized care [7].

Regarding the profile of the population served, a predominance of adult and female patients was observed, a pattern similar to that identified in a study conducted in another public hospital in Pernambuco[7]. However, the specialties offered differ, which may be due to regional specificities and the adherence of the health professional as a *sine qua non* condition for the provision of this type of care, as provided for in current legislation [1].

The increase in the number of specialties adopting teleconsultation, from two to twelve, highlights the acceptance and consolidation of the method, which is responsible for optimizing care flows and offering solutions for situations that previously required unnecessary physical travel.
In terms of expansion, the proposed model can be adapted to other specialties and care settings, as teleconsultation is promising and efficient for improving healthcare services. At our facility, we plan to expand telehealth initiatives to the surgical center, already in progress, and the Diagnostic Imaging and Specialized Diagnostics Unit.

A satisfaction survey of HU-UFSCar users who underwent teleconsultations demonstrated that they were highly satisfied with the professional and with the way their needs were met, similar to data from a survey at a hospital in Pernambuco[7].

This positive result is related to factors such as improved clinical follow-up, ease of use, and reduced costs, travel time, and in-person visits. This demonstrates its practicality and efficiency. In other words, it is a method that can positively enhance the patient experience in healthcare services[9].

However, the challenges encountered during the process, such as difficulties in accessing the system and patient adaptation, are endorsed both by digital literacy that still needs to be worked on in the Brazilian reality, and by the unavailability or instability of an internet network that allows a satisfactory exchange of data for carrying out the teleconsultation, while enabling technical support from family members or caregivers at the time of the teleconsultation and the use of assistive technology could mitigate them and promote health equity[8].

The use of WhatsApp Business as a communication and patient support tool has proven effective and is consistent with practices described in the literature [7;10], promoting a positive patient experience with this type of care.

As evidenced by participants' reports, there are differences between in-person and remote care (teleconsultation). It is important to identify the situations or conditions under which teleconsultation is recommended, aiming not only to promote safe and efficient care but also to reduce resistance among patients or professionals involved in this type of care [11].

Given the above, the experience of HU-UFSCar can serve as a reference for other university hospitals, promoting technological and care advances in Brazil, as it demonstrates its potential to overcome geographical barriers and expand access to quality care [12].

CONCLUSION

The experience of implementing teleconsultations at HU-UFSCar has shown that the success of this model is closely tied to an integrated approach that combines technology, technical support, and user-centered practices. The steady increase in participating specialties highlights the acceptance and establishment of this method, which has proven effective in optimizing care processes and addressing needs efficiently and safely.

It is advisable for other university hospitals to consider creating dedicated telehealth teams that integrate technology with educational strategies, focusing on the expansion and sustainability of this care model.

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