




Assessment of the usability of teleconsultations during the COVID-19 pandemic at a children's hospital

Agustina del R. Sbruzzi^a , Romina Ledesma^a, Pablo Domínguez^a, Emiliano Gigliotti^a ,
Mariano E. Ibarra^a 

ABSTRACT

Introduction. Usability in a telemedicine system directly affects the efficiency and effectiveness of remote health care.

Objective. To assess the usability of teleconsultations during the COVID-19 pandemic.

Population and method. This was a cross-sectional study. The caregivers of children aged 1 month to 12 years were included. Usability was assessed with the Telehealth Usability Questionnaire, adapted to Spanish. Socioeconomic data were also assessed.

Results. The response rate was 70.2% (n = 221). Most responders were women whose average age was 33 years, had completed secondary education and had public health insurance. Of them, 87.8% selected telephone health care and 88.2% had their first teleconsultation. The overall satisfaction was high, with lower scores for ease of use and learning how to use video calls.

Conclusion. Regardless of modality, the usability of teleconsultations by caregivers of children aged 1 month to 12 years was adequate.

Keywords: teleconsultation; telemedicine; COVID-19; information technology; pediatrics.

doi: <http://dx.doi.org/10.5546/aap.2023-10163.eng>

To cite: Sbruzzi AR, Ledesma R, Domínguez P, Gigliotti E, Ibarra ME. Assessment of the usability of teleconsultations during the COVID-19 pandemic at a children's hospital. *Arch Argent Pediatr* 2024;122(1):e202310163.

^a Hospital General de Niños Pedro de Elizalde, City of Buenos Aires, Argentina.

Correspondence to Agustina del R. Sbruzzi: sbruzziagustina@gmail.com

Funding: None.

Conflict of interest: None.

Received: 7-21-2023

Accepted: 10-5-2023



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INTRODUCTION

Usability in the field of digital health refers to the ease with which users interact with information and communication technologies (ICTs) to perform healthcare tasks.¹ This is a fundamental aspect in telemedicine, as it influences the efficiency and effectiveness of remote health care.²

The preventive social isolation measures established during the COVID-19 pandemic forced healthcare systems to rethink how to provide access to health care. The City of Buenos Aires (CABA) implemented a telehealth program.³ This program proposed teleconsultations as the strategy to warrant access to consultations and, in this way, overcome the physical barriers imposed by the pandemic. While telemedicine is intended to improve access to health care, vulnerable populations may not be able to obtain such benefit.^{4,5}

The population that uses the public health care system in CABA is mostly characterized by a low level of education, place of residence in another district, exclusive public health insurance, and high levels of informal employment.⁶ In addition, they have a limited technological infrastructure, which may be a barrier to ICT access and perpetuate the digital divide.⁷ For this reason, it is necessary to carry out usability assessments to adapt advances to the characteristics of users.^{8,9} Taking into account that few studies have been conducted in Argentina that addressed the usability of teleconsultations in vulnerable populations, our aim was to assess the usability of teleconsultations among caregivers of pediatric patients younger than 12 years at Hospital General de Niños Pedro de Elizalde (HGNPE) during the COVID-19 pandemic.

POPULATION AND METHOD

Design. This was a cross-sectional, analytical study.

Setting and period. The study was conducted at the Area of Remote Health Care and Guidance (Área de Orientación y Atención a Distancia, AOAD) of HGNPE between 01/01/2021 and 04/30/2021. During the COVID-19 pandemic, the AOAD worked as an access point to the hospital through teleconsultations (video or telephone call) on a scheduled or spontaneous basis.

Population. All caregivers of children aged 1 month to 11 years and 11 months who conducted teleconsultations for the first time with

our service were included. Caregivers whose responses could not be retrieved, regardless of the reason, were excluded.

Outcome variable. Usability was assessed with the validated Telehealth Usability Questionnaire as adapted to Spanish.¹⁰ This questionnaire assesses the factors that determine the usability of a system: usefulness, ease of use and learning, interface quality, interaction quality, efficiency, reliability, satisfaction, and future use. The questionnaire was sent electronically after the teleconsultation.

Other study variables. We collected information on the type of teleconsultation and socioeconomic variables in order to establish the characteristics of the study population.

Finally, we decided to perform a *post hoc* analysis taking the modality of teleconsultation (video or telephone call) as a predictor variable.

Statistical analysis. Continuous variables were described as mean and standard deviation or median and interquartile range, based on the observed distribution. Categorical variables were described as proportions and their corresponding 95% confidence interval (CI). Student's t test was used for independent samples in the *post hoc* analysis. The teleconsultation modality was the predictor variable and each question in the questionnaire was considered an outcome variable. A value of $p < 0.05$ was considered significant in all cases.

Ethical considerations. Potential participants were asked for their informed consent. Personal data was disassociated to protect their privacy and safety. The study was approved by the Research Ethics Committee of HGNPE under registry no. 3767.

RESULTS

In the period between 01/01/2021 and 04/30/2021, the AOAD conducted 1217 teleconsultations; 315 questionnaires were sent to caregivers who had a first-time teleconsultation and the percentage of response was 70.2% ($n = 221$). *Figure 1* describes the flow of participant inclusion in detail.

Regarding the study population, 92.8% of the caregivers were women with an average age of 33 years; 57.0% had completed secondary education, and 77.8% had exclusive public health coverage. As for the modality of care, 87.8% opted for a telephone call and 88.2% had their first teleconsultation. *Table 1* describes the characteristics of the study population.

FIGURE 1. Participant inclusion

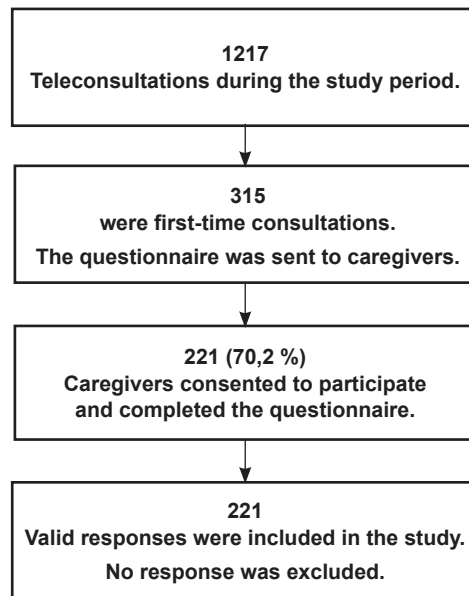


Table 2 shows the questionnaire results. Scores were above 6 across all assessed items. The item “Using the telehealth system, I could see the physician as well as if we met in person” was assessed only for the video call modality ($n = 27$). The *post hoc* analysis showed that the items “It was simple to use this system” and “It was easy to learn to use the system” obtained a significantly

lower score for video calls compared to telephone calls (6.87 [0.55] versus 6.48 [1.08]; $p < 0.01$ and 6.87 [0.55] versus 6.44 [1.15]; $p < 0.01$). Table 3 shows the *post hoc* analysis results.

DISCUSSION

This study assessed the usability of teleconsultations in caregivers of pediatric

TABLE 1. Characteristics of the population ($n = 221$)

Age of caregivers, in years	33.2 (8.1)
Self-perceived gender	
Female	205 (92.8 %)
Male	16 (7.2 %)
Maximum level of education completed	
Primary education	37 (16.7 %)
Secondary education	126 (57.0 %)
Tertiary education	35 (15.8 %)
University education	23 (10.4 %)
Exclusive public health insurance	172 (77.8 %)
Computer at home	96 (43.4 %)
Internet access at home	194 (87.8 %)
Teleconsultation modality	
Telephone call	194 (87.8 %)
Video call	27 (12.2 %)
First-time teleconsultation	195 (88.2 %)

Categorical variables were described as absolute and relative frequencies.

Continuous variables were described as mean and standard deviation.

n : number.

patients who used the services of the AOAD during the COVID-19 pandemic. Our results indicate that the usability of the teleconsultation system was positively assessed. This finding is relevant because the study population shows markers of social vulnerability, such as a low level of education, exclusive public

health insurance coverage and limited digital infrastructure. These characteristics have been described as potential limiting factors in the uptake and use of teleconsultations.^{11,12} However, our results indicate that usability was very good and is consistent with what has been observed by Wilcamango-Rios et al.¹³ in a population

TABLE 2. Responses to the usability questionnaire

	n	Mean (SD)
Telehealth improves my access to health care services.	221	6.72 (0.83)
Telehealth saves me time traveling to a hospital/clinic or specialist's office.	221	6.72 (0.82)
It was simple to use this system.	221	6.83 (0.65)
It was easy to learn how to use the system.	221	6.82 (0.67)
I can easily talk to the physician using the telehealth system.	221	6.77 (0.80)
I feel I was able to express myself effectively.	221	6.88 (0.39)
Using the telehealth system, I could see the physician as well as if we met in person.	27	6.56 (1.28)
Whenever I made a mistake using the system, I could recover easily and quickly.	221	6.40 (1.20)
I felt comfortable communicating with the physician using the telehealth system.	221	6.81 (0.71)
Telehealth is an acceptable way to receive healthcare services.	221	6.63 (0.92)
I would use the telehealth system again.	221	6.77 (0.75)
I am satisfied with the telehealth system.	221	6.83 (0.62)

n: number; *SD*: standard deviation.

TABLE 3. Usability based on teleconsultation modality. Post hoc analysis (n = 221)

	Telephone call (n = 194)	Video call (n = 27)	<i>p</i> *
Telehealth improves my access to healthcare services.	6.72 (0.84)	6.70 (0.66)	0.89
Telehealth saves me time traveling to a hospital/clinic or specialist's office.	6.73 (0.80)	6.66 (0.91)	0.69
It was simple to use this system.	6.87 (0.55)	6.48 (1.08)	< 0.01
It was easy to learn how to use the system.	6.87 (0.55)	6.44 (1.15)	< 0.01
I can easily talk to the physician using the telehealth system.	6.77 (0.81)	6.77 (0.69)	0.97
I feel I was able to express myself effectively.	6.88 (0.36)	6.81 (0.55)	0.37
Using the telehealth system, I could see the physician as well as if we met in person.	N/A	N/A	N/A
Whenever I made a mistake using the system, I could recover easily and quickly.	6.40 (1.18)	6.40 (1.33)	0.98
I felt comfortable communicating with the physician using the telehealth system.	6.80 (0.72)	6.85 (0.60)	0.74
Telehealth is an acceptable way to receive healthcare services.	6.64 (0.91)	6.48 (0.97)	0.37
I would use the telehealth system again.	6.77 (0.77)	6.77 (0.57)	0.97
I am satisfied with the telehealth system.	6.82 (0.62)	6.85 (0.60)	0.83

The score for each question is described as mean and standard deviation.

* Student's *t* test.

N/A: not applicable; *n*: number.

with similar characteristics in Peru and with that observed by Geng-Ramos et al.¹⁴ in the United States in a population with a high level of education and good general socioeconomic status.

The positive results observed in relation to the usability of teleconsultations may be explained in several ways. Firstly, the good usability of the teleconsultation system may be attributed to the specific characteristics of our implementation. We developed the AOAD at the beginning of the pandemic taking into account that our hospital provides care to a vulnerable population and that, therefore, the system had to be simple and accessible. Secondly, the pandemic may have had a direct effect on outcomes. The lack of access to health care that characterized this period may have resulted in an important bias in the population that accessed teleconsultations. Usability is assessed among those who accessed the system; therefore, those who did not access were not assessed and may be the most vulnerable individuals. In this regard, system usability may not be an adequate way to assess the equity of access to and adoption of teleconsultations.

Considering that most caregivers requested the telephone call modality and that the teleconsultation modality could influence its usability, we decided to perform a *post hoc* analysis. Although the video call scored significantly lower in the items related to ease of use and learning how to use the system, the difference was minimal and the score was still high, above 6 in all the items assessed. This indicates that, regardless of the modality requested, the usability of the system was adequate for our study population.

Our study has several limitations. Although the response rate was less than 80%, in health-related questionnaires, values above 70% are considered representative of the population.¹⁵ In addition, it is important to keep in mind that our study population represents the most vulnerable sectors of society. Although this could result in a bias in the results, it is precisely in these populations where the lowest levels of access to ICTs are observed, which highlights the need for more comprehensive investigations and interventions in this type of populations to responsibly address the digital divide.

CONCLUSION

This study assessed the usability of teleconsultations at a tertiary care children's

hospital in Argentina. It was observed that, regardless of modality, the usability of teleconsultations by caregivers of children aged 1 month to 12 years was adequate. ■

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