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Experience report of speech therapy in telehealth with neurological patients with dysphagia and dysarthria during the Covid-19 pandemic

Relato da experiência da atuação fonoaudiológica em telessaúde em pacientes neurológicos com disfagia e disartria durante a pandemia de Covid-19

Reporte de experiencia de desempeño logopédico en telesalud en pacientes neurológicos con disfagia y disartria durante la pandemia de Covid-19

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Abstract

Introduction: Due to COVID-19, patients with neurological disease no longer attend face-to-face speech therapy consultations in outpatient clinics. **Objective:** To describe the report of the speech therapy experience patients with neurological disease with dysarthria and/or dysphagia during the COVID-19 pandemic through telehealth. **Method:** This is an experience report. Patients from the speech therapy outpatient clinic of a university hospital who were deprived of speech therapy during a pandemic period and had a diagnosis of dysphagia and/or dysarthria (prior to the pandemic) were included. In total, 43 patients were invited to participate in the study. Individuals were separated according to their speech-language diagnosis: dysphagia, dysarthria, and dysphagia/dysarthria. In the beginning, all were reassessed in video calls: dysphagia (Northwestern dysphagia patient check sheet, Functional Oral Intake Scale, and Food Self-Assessment Instrument); dysarthria (speech collection and self-perception questionnaire Radbould Oral Motor Inventory for Parkinson's disease). Afterward, the patients were randomly allocated: speech therapy telecare for four consecutive weeks, with the other being a control group, without interventions and/or guidance. All were reassessed for comparison before and after speech therapy follow-up. **Results:** Nine participants completed all stages of the study, 6 (66.66%) men. The mean age was 60.44 years (±16.13). Participants had a medical diagnosis of neurological disease, 2 of which were neurogenetic (22.22%), five neurodegenerative (55.5%), and two neurologic (22.22%). No descriptive differences were observed between groups in pre- and post-intervention assessments. The loss in the sample happened due to the lack of technological devices and the overload of caregivers. **Conclusions:** The experience in telehealth was positive, revealing the difficulty of its implementation in neurological patients with low socio-financial and educational conditions.

Keywords: Telemedicine; Dysarthria; Deglutition Disorders; Social Isolation; Coronavirus Infections

Resumo

Introdução: Devido à COVID-19, os pacientes com doenças neurológicas deixaram de frequentar presencialmente as consultas fonoaudiológicas em ambulatórios. **Objetivo:** Descrever o relato da experiência fonoaudiológica em pacientes com doença neurológica com disartria e/ou disfagia durante a pandemia da COVID-19 através da telessaúde. **Método**: Trata-se de um relato de experiência. Foram incluídos pacientes do ambulatório de fonoaudiologia de um hospital universitário, que ficaram privados do acompanhamento fonoaudiológico em período pandêmico e que tinham diagnóstico de disfagia e/ou disartria (prévios à pandemia). No total, 43 pacientes foram convidados a participar do estudo. Os indivíduos foram separados de acordo com seu diagnóstico fonoaudiológico: disfagia, disartria e disfagia/disartria. No início, todos foram reavaliados em videochamadas: disfagia (*Northwestern dysphagia patient check sheet*, Escala Funcional de Ingestão Via Oral e Instrumento de Autoavaliação da Alimentação); disartria (coleta de fala e questionário de autopercepção *Radbould Oral Inventory Motor for Parkinson's disease*). Após, os pacientes foram alocados aleatoriamente: teleatendimento fonoaudiológico por quatro semanas consecutivas, sendo o outro grupo controle, sem intervenções e/ou orientações. Todos foram reavaliados para a comparação pré e pós-acompanhamento fonoaudiológico. **Resultados:** Nove participantes concluíram todas as etapas do estudo, sendo 6 (66,66%) homens. A média de idade foi de 60,44 anos (±16,13). Os participantes possuíam diagnóstico médico de doença neurológica, sendo 2 neurogenética (22,22%), 5 neurodegenerativa (55,5%) e 2 neurológicas (22,22%). Não foram observadas diferenças descritivas entre os grupos nas avaliações pré e pós-intervenção. A perda na amostra aconteceu devido à falta de dispositivos tecnológicos e à sobrecarga dos cuidadores. **Conclusões:** A experiência em tele fonoaudiologia, apesar de ter sido positiva, revelou a dificuldade da sua implementação em pacientes neurológicos de baixa condições sócio financeiras e educacional.

Palavras-chave: Telemedicina; Disartria; Transtornos de Deglutição; Isolamento Social; Infecções por Coronavírus

Resumen

Introducción: Debido al COVID-19, los pacientes con enfermedades neurologicas ya no asisten a consultas de logopedia presenciales en consultas externas. Objetivo: Describir el relato de la experiencia fonoaudiológica en pacientes con enfermedades neurologicas con disartria y/o disfagia durante la pandemia de COVID-19 a través de telesalud. **Método:** Este es un relato de experiencia. Se incluyeron pacientes de la consulta externa de logopedia de un hospital universitario, que fueron privados de logopedia durante un período de pandemia y que tenían diagnóstico de disfagia y/o disartria (previo a la pandemia). En total, 43 pacientes fueron invitados a participar en el estudio. Los individuos se separaron según su diagnóstico del habla y el lenguaje: disfagia, disartria y disfagia/disartria. Al principio, todos fueron reevaluados en videollamadas: disfagia (*Northwestern dysphagia patient check sheet)*, Escala de ingesta oral funcional e Instrumento de autoevaluación de alimentos); disartria (cuestionario de recogida de voz y autopercepción Radbould Oral Motor Inventory for Parkinson's disease). Posteriormente, los pacientes fueron asignados aleatoriamente: teleasistencia logopédica durante cuatro semanas consecutivas, siendo el otro grupo control, sin intervenciones y/u orientaciones. Todos fueron reevaluados para compararlos antes y después del seguimiento con logopedia. **Resultados:** Nueve participantes completaron todas las etapas del estudio, 6 (66,66%) hombres. La edad media fue de 60,44 años (±16,13). Los participantes tenían diagnóstico médico de enfermedad neurológica, 2 de ellas neurogenéticas (22,22%), 5 neurodegenerativas (55,5%) y 2 neurológica (22,22%). No se observaron diferencias descriptivas entre los grupos en las evaluaciones previas y posteriores a la intervención. La pérdida en la muestra ocurrió por la falta de dispositivos tecnológicos y la sobrecarga de cuidadores. **Conclusiones:** La experiencia en telefonoaudiología, a pesar de ser positiva, reveló la dificultad de su implementación en pacientes neurológicos de baja condición socioeconómica y educativa.

Palabras clave: Telemedicina; Disartria; Transtornos de Deglutición; Aislamiento de Pacientes; Infecciones por Coronavírus.

Introduction

COVID-19 results in respiratory complications and can trigger pneumonia, with possible worsening in people with previous neurological disease[1]. For this reason, elective care was suspended in the early stages of the epidemic, and many of the essential services provided to this population had to be interrupted. With the interruption of face-to-face care, patients with neurological diseases became more vulnerable to health problems caused by the progression of their underlying diseases[2].

Among the injuries that neurodegenerative diseases can present, there are progressive clinical symptoms such as dysphagia and/or dysarthria[3,4,5]. Since, in dysphagia, the consequences are worse, with an increased probability of laryngotracheal penetration and/or aspiration, increasing the risk of dehydration, malnutrition, and recurrent pneumonia, and may even cause death[3,4]. For this reason, the resumption of care through telemarketing was a necessity in this period of adaptation, and its applicability was a concern among health professionals. Thus, telehealth services have become an essential care strategy to maintain outpatient care even during the pandemic[6,7,8].

In 2013, the Federal Council of Speech Therapy approved the use of teleassistance and telemonitoring based on the guidelines of Resolution 427/2013. Aiming to guarantee speech-language pathology health care, considered urgent or essential, during adverse situations[6]. Despite this approval being old, this use was not commonly practiced in Brazil by speech therapists[6]. The COVID-19 pandemic meant that professionals had to rethink their clinical practice and improve their strategies, motivated by the need to maintain communication with their patients, thus spreading the use of teleassistance and speech therapy telemonitoring.

Situational health strategies and epidemiological perspectives are indispensable for the organization of the health system, as well as the evidence-based practice associated with telecare[9]. Nevertheless, experience reports aim to contribute to improving clinical practice and organization of health services and supporting randomized clinical trials to be proposed. There needs to be more evidence on the effectiveness of this care modality in the literature in emerging countries under

social vulnerability. Studies carried out before the pandemic pointed to positive results with the use of telehealth by speech therapists[10]. This service model improved, for example, the efficiency of the service by reducing the patient's waiting time.

Furthermore, it has been well received by patients and therapists alike and generated cost benefits for healthcare services. However, a recent study in the context of a pandemic pointed out some adversities to using this practice, such as the lack of resources and the absence of prior training for the use of technologies with patients11. Although the use of teleassistance has increased during the pandemic, studies on this practice in speech therapy are still little explored, especially in Brazil, where there is a lot of inequality and social vulnerability[12].

This study aimed to describe the speech therapy experience in patients with a neurological disease with dysarthria and/or dysphagia during the COVID-19 pandemic through telehealth.

Method

This study is experience reports of speech therapy telecare carried out with patients at the outpatient neurology clinic of a public and university hospital in Rio Grande do Sul, Brazil. The project was approved by the hospital's Ethics Committee above under number 2020-0256 and number CAAE: 31814920200005327.

All patients with scheduled consultations were included in this study, regardless of the technological resources they had, in a specialized speech therapy outpatient clinic of a public hospital from March to June 2020, the beginning of the COVID-19 pandemic, when all face-to-face and elective outpatient consultations were suspended, with a speech-language pathology diagnosis of dysphagia and/or dysarthria, aged over 18 years and who had already performed at least one face-to-face speech--language evaluation consultation at the outpatient clinic. Institutionalized, hospitalized patients and/or undergoing speech therapy at another institution were excluded. The consecutive intentional sample consisted of 59 patients diagnosed with neurological disease. Of these, 16 patients were excluded, one due to death records and 15 due to unsuccessful telephone contacts.

Sociodemographic data were obtained from the hospital's electronic medical record (age, sex, education, and residence) and the neurological and speech-language pathology diagnoses of dysphagia and/or dysarthria, referring to the patient's prior face-to-face consultation. A telephone call was made and recorded using the ACR Cube application by a trained researcher to invite patients from the outpatient clinic to participate in the study after reading the informed consent form in detail. All 43 participants who agreed to participate were divided, for data analysis, into teleservice (21 participants) and Control Group (CG) (22 participants) according to the speech therapy diagnosis, namely: (1) teleservice dysphagia, (2) control dysphagia, (3) tele-assistance dysphagia and dysarthria, (4) control dysphagia and dysarthria, (5) tele-assistance dysarthria and (6) control dysarthria.

The initial assessment of the participants was via video call, at the beginning of this study, after an invitation to join an individual session using the Jitsi Meet program lasting approximately 30 minutes. This application was chosen because it is free, allows recording, and it is not necessary to download any program and/or have access to email; just click on the link sent. The speech therapist who made the call received previous training and experience in the area. This professional was responsible for inviting, assessing, and reassessing the participants.

The assessment instruments varied according to the patient's previous speech-language pathology diagnosis in the last face-to-face speech-language pathology consultation. For patients with dysphagia: Northwestern dysphagia patient check sheet (NDPCS)[13,14], Functional Oral Intake Scale (FOIS)[15,] and Food Self-Assessment Instrument (EAT-10)[16].

For patients with dysarthria, the Radbould Oral Motor Inventory for Parkinson's disease (ROMP)[17] self-perception questionnaire was used, as well as speech collection by recording the telephone conversation using the ACR Cube with tasks related to each of the speech subsystems. For the diagnosis of dysarthria, five speech therapists trained and blinded to the groups performed the auditory-perceptual analysis through consensus, classifying speech as normal, mild, moderate, or severe dysarthria.

Telemarketing participants received individual weekly speech therapy intervention from another speech therapist with at least three years of training, who was responsible only for the participants'

therapy. The intervention was performed once a week for four consecutive weeks, lasting 30 minutes each, using the Jitsi Meet video call program. Patients were previously advised about scheduling the day and time of the appointment online. Table 1 is a detailed description of the interventions carried out in the call center. Patients with a lack of technological devices (cell phone, tablet/or computer) and insufficient internet network to make calls were included as CG. They did not receive any intervention during this period.

It is essential to highlight that all dates were maintained and followed six consecutive weeks of the protocol of this study (Pre-Assessment - 4 speech therapy sessions - Post-Reassessment). After four weeks of therapy, the patients of all patients were reassessed; the same assessment instruments were used.

Chart 1. Activities carried out in speech therapy telehealth.

Activities for Dysphagia	Activities for Dysarthria	Activities for Dysphagia and Dysarthria
Guidelines on volume and speed of food intake	Breath control exercises	Guidelines on volume and speed of food intake.
Airway protective maneuvers.	Overarticulation exercises (vowels, syllables, directed and spontaneous speech).	Airway protective maneuvers.
Guidelines on food consistencies and use of thickeners. Guidelines on food consistencies and use of thickeners.		Exercises for tonicity articulatory oral and intraoral sensitivity.
Guidelines on food consistencies and use of thickeners.		Guidelines on food consistencies and use of thickeners.
		Breath control exercises.
		Overarticulation exercises (vowels, syllables, directed and spontaneous speech).

Descriptive analyses with absolute and relative frequencies and dispersion measures were calculated using SPSS v.20.

Results

Of the 43 participants, 21 performed teleservice (subgroups 1, 3, and 5); however, only five (55.5%) patients were able to participate in the entire research protocol (Assessment - therapy, and reassessment) - 6 visits), one in the dysarthria group, two in the dysphagia group and two in the dysarthria group/dysphagia.

Furthermore, of the 22 who were included in the control group (subgroups 2, 4, and 6), only four (44.5%) were able to participate in the two proposed services (assessment and reassessment), two in the dysarthria group, one in the dysphagia group and one in the dysphagia and dysarthria group. Only 20.93% (9 participants) of the sample completed all study phases.

The lack of access to a quality internet network for video calls and/or access to a network with the reduced signal; electronic equipment incompatible with video; difficulty in handling electronic equipment; the need for help from a caregiver and/or family member to take the cell phone (camera and microphone) and difficulty understanding the use of the application (Jitsi) to make the video call were the main reasons for the difficulty in completing the six consecutive weeks foreseen in the protocol of this study Therefore, 9 participants were included in the study, 5 in call center and 4 in the control group.

The mean age of the analyzed participants was 60.44±16.13 years. Most were male 6 (66.66%) and had Parkinson's disease as the underlying disease (55.55%). The predominant level of education (55.55%) was up to elementary school. The sample characteristics stratified by existing groups are described in Table 1.

Table 1. Characteristics of the sample studied in the study's baseline. Brazil, Rio Grande do Sul, 2020

Variables	Telehealth			Group Control		
	Dysphagia	Dysarthria	Dysphagia and Dysarthria	Dysphagia	Dysarthria	Dysphagia and Dysarthria
Sex						
Female	0 (0%)	1 (0%)	1 (50%)	0 (0%)	1 (50%)	0 (0%)
Male	2 (100%)	0 (0%)	1 (50%)	1 (100%)	1 (50%)	1 (100%)
Average age	57	49	56,5	88	59	62
Disease						
Neurogenetics	0 (0%)	1 (100%)	1 (50%)	0 (0%)	0 (0%)	0 (0%)
Neurodegenerative	2 (100%)	0 (0%)	1 (50%)	0 (0%)	2 (100%)	0 (0%)
Neurologic	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)
Schooling Years						
Up to 8 years of schooling	2 (100%)	0 (0%)	1 (50%)	1 (100%)	1 (50%)	0 (0%)
More than 8 years of schooling	0 (0%)	1 (100 %)	1 (50%)	0 (0%)	1 (50%)	1 (100%)

Comparing pre-and post-intervention assessments (ROMP, EAT-10, FOIS, and NDPCS) [13,14,15,16] showed slight worsening or maintenance of results in the call center group and in the control group.

The evaluations are shown in Tables 2, 3, and 4.

Table 2. Results of pre- and post-care evaluations for the dysarthria group during a four-week interval. Brazil, Rio Grande do Sul, 2020

Protocols	Patients	Inicial Assessment	Final Assessment
ROMP	1 tele	7	7
	2 control	11	11
	3 control	22	21
Susteined vowel"a"	1 tele	Adequate	Adequate
	2 control	Adequate	Adequate
	3 control	Adequate	Adequate
"PATAKA"	1 tele	Adequate	Adequate
	2 control	Adequate	Adequate
	3 control	Adequate	Adequate

ROMP= Radbould Oral Inventory Motor for Parkinson's disease. Tele= Telehealth

Table 3. Results of pre- and post-assessments for the dysphagia group during a four-week interval. Brazil, Rio Grande do Sul, 2020

Group Dysphagia	Patient	Inicial Assessment	Final Assessment
	1 tele	5	0
EAT-1O	2 tele	2	6
	3 control	0	-
	1 tele	5	5
FOIS	2 tele	7	5
	3 control	5	-
	1 tele	8	8
NDPCS 1-12	2 tele	0	2
	3 control	1	-
	1 tele	6	6
NDPCS 13-21	2 tele	2	4
	3 control	2	-
	1 tele	0	0
NDPCS 22-28 – Water	2 tele	0	3
	3 control	-	-
	1 tele	0	0
NDPCS 22-28 - Pure	2 tele	0	0
	3 control	0	-
	1 tele	7	8
NDPCS 22-28 – Solid	2 tele	0	2
	3 control	0	-

EAT-10= Eating Assessment Tool; FOIS= Functional Oral Intake Scale; NDPCS= Northwestern dysphagia patient check sheet; Tele= Telehealth

Table 4. Results of pre- and post-assessments for the dysphagia and dysarthria group during a four-week interval. Brazil, Rio Grande do Sul, 2020

Protocols	Patient	Inicial assessment	Final assessment
	1 tele	3	3
EAT-1O	2 tele	6	7
	3 control	0	-
	1 tele	6	7
FOIS	2 tele	5	6
	3 control	7	-
	1 tele	1	0
NDPCS 1-12	2 tele	1	1
	3 control	1	-
	1 tele	0	3
NDPCS 13-21	2 tele	3	5
	3 control	3	-
	1 tele	1	0
NDPCS 22-28 - Água	2 tele	1	3
	3 control	0	-
	1 tele	0	0
NDPCS 22-28 - Pastoso	2 tele	0	0
	3 control	-	-
	1 tele	-	-
NDPCS 22-28 - Sólido	2 tele	-	-
	3 control	0	0
	1 tele	13	13
ROMP	2 tele	21	21
	3 control	0	-

EAT-10= Eating Assessment Tool; FOIS= Functional Oral Intake Scale; NDPCS= Northwestern dysphagia patient check sheet; ROMP=Radbould Oral Inventory Motor for Parkinson's disease. Tele= Telehealth

Discussion

In the present study, teleservice did not reveal a descriptive improvement in dysarthria and dysphagia in patients with neurological disease based on the instruments evaluated. However, the experience was positive, allowing communication and monitoring of patients who may have severe health complications.

A social vulnerability was a suggestive impediment to carrying out this study and the severity of the cases. Complications caused by underlying diseases require specialized care and a comprehensive support network. The adverse outcomes in this context make it difficult for new strategies to be studied so that Speech Therapy can reinvent itself in the face of the recent epidemiological scenario, even when the social environment is unfavorable.

Limited access to specialist care is a significant barrier to health care. Access, accessibility, and use of the health service are complex and are related, in addition to supply, to the ability to produce services according to the health needs perceived by the user[19]. Individuals with neurological pathologies should seek care at the primary care level in their reference Basic Health Units (UBS). Subsequently, users are referred to the high complexity care level due to the severity of the case[21]. From then on, these individuals are seen weekly, fortnightly and/or monthly by the outpatient clinics that were referred. So that they would be supervised during the COVID-19 pandemic, most establishments implemented telehealth since continuous care was required. This remote resource was essential to avoid the collapse of the health system and reinforces the importance of speech therapists and the interdisciplinary team's active role in proposing new alternatives to maintain the care and monitoring of their patients[19].

Care, timely guidance, and application of interventions can reduce the risk of negative consequences for health and should represent a high priority in healthcare practices[19]. However, the present study described that neurological patients need an active social and personal support network to adhere to telecare. In addition, the therapy itself did not improve stomatognathic functions based on the analyzed instruments, suggestively due to the short intervention time, difficulty in understanding distance activities (impairments in visual and auditory capacity), lack of lighting, setting, and transmission of the audio in a good way, due to the short service time, the difficulty in understanding the activities at a distance and the difficulty in handling the technological resources.

Telehealth can be an essential means of monitoring and supporting cases with a diagnosis of neurological disease, reducing the demand of patients who, therefore, will not need to go to the hospital every week, as well as helping those who are unable to go to the outpatient clinic (wheelchair users and individuals living more than 4 hours away, who need to go to the referral center weekly for follow-up of speech therapy due to lack of speech therapy in the region of origin). However, adequate technological resources, training, and guidance are necessary for patients and their caregivers to adhere to this type of care. Health professionals' new forms of patient care and management should be driven by increased access to the internet worldwide. However, with persistent social inequality, especially in emerging countries such as Brazil, where economic disparities are huge[20], financial resources will need to be allocated to the most vulnerable populations for this type of care to be effective.

Since 2000, research has been developed in favor of teleassistance, showing its viability and reliability in clinical evaluations of teledynamic swallowing and in televideofluoroscopies, mainly in the United States of America[13,14,15,16]. teletreatment, despite still having little scientific evidence, already demonstrates promising results[21]. Regarding the reliability of speech assessment data in the teleservice model, researchers have shown compatibility between dysarthria assessment in the online and face-to-face method[22]. The study showed that there was a 90% level of agreement between the two assessment environments for the classification of the overall severity of dysarthria. The study points out that the assessment, based on the internet, has the potential as a reliable method to assess motor speech[22]

The call center resource must be adaptable according to the context of each region. In Australia, difficulties in accessing face-to-face dysphagia services contributed to the emergence of the teleassistance resource. The model improved service efficiency by reducing patient waiting time; saving time for physicians by reducing travel. In addition, it was well received by patients and physicians, bringing direct cost benefits to health services[10]. These results were expected in the present research

context; however, the study's limitations needed to be demonstrated in the ideal scenario and point to essential reflections. In China, an online survey was conducted with speech therapists during the COVID-19 pandemic. Most participants reported needing more training to use telepractice or technologies and were insecure about the online method. However, professionals recognized the importance of emergency implementation of teleassistance[11].

Adapting professionals, patients, and resources to telecare also involves challenges and setbacks. Thus, the limitations found in this study were the loss of contact with these patients, mainly due to the absence of electronic devices compatible with video calls, the instability of the internet network, the difficulty in handling digital resources, the occurrences of power outages electricity and fluctuations in the quality of the patients' telephone signal. In any case, the results of the present study reveal the experience of a public hospital in Brazil, during the beginning of the COVID-19 pandemic. The advances and challenges point to the need for dedication from health professionals in discovering new methods or ways of effectively assisting this population.

Conclusion

Despite being positive, the experience in remote speech therapy revealed the difficulty of its implementation in patients with neurological disease, demonstrating the peculiarities of this target audience of low socioeconomic and educational levels.

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