Characteristics and perceptions of telerehabilitation consultations by neuropediatric physical therapists during the COVID-19 pandemic

Características e percepções das consultas por telerreabilitação pelos fisioterapeutas neuropediátricos durante a pandemia da COVID-19

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Date of first submission: July 21, 2021
Last received: February 9, 2022
Accepted: February 21, 2022
Associate editor: Clynton Lourenço Correa

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Abstract

Introduction: The COVID-19 pandemic brought a strong discussion about telerehabilitation, especially in countries where its practice was not allowed previous the pandemic. In the neuropediatric rehabilitation field evidence of the effectiveness of this modality of assistance and data about provider and family's perceptions are scarce. **Objective:** To evaluate the characteristics of telerehabilitation physical therapy consultations for children with neurological diseases during the COVID-19 pandemic and report the perceptions of physical therapists about this modality of assistance. **Methods:** An online survey was created and administered to Brazilian neuropediatric physical therapists. The survey consisted of demographics data, questions about the characteristics of telerehabilitation consultations, and physical therapists' perception of telerehabilitation assistance. **Results:** From July to September 2020, 394 physical therapists responded to the questionnaire. The most of them took 21 to 30 minutes per telemonitoring session (26.9%), offered one session per week (61.0%), and used electronic messages as the main method of delivery (39.9%). The main difficulty reported was caregivers' lack of understanding about handling during sessions (41.2%) and problems with internet connection (16.7%). Additionally, most of them reported that it is highly important important to provide healthcare via telerehabilitation to the economically disadvantaged. **Conclusion:** The findings of this study provide insight into the complex and challenging process of telerehabilitation assistance during the first wave of the COVID-19 pandemic. Despite the reported challenges, telerehabilitation can be an opportunity to better understand children's activities and participation in home context.

Keywords: COVID-19. Rehabilitation. Telerehabilitation. Pediatrics.

Resumo

Introdução: *A pandemia da COVID-19 trouxe uma forte discussão sobre o uso da telerreabilitação, especialmente em países onde a sua prática ainda não havia sido permitida antes da pandemia. Na área da reabilitação neuropediátrica as evidências sobre a efetividade dessa modalidade de atendimento e informações sobre as percepções dos provedores e família são escassas.* ***Objetivo:*** *Avaliar as características das consultas fisioterapêuticas por telerreabilitação em crianças com condições neurológicas durante a pandemia de COVID-19 e relatar as percepções dos fisioterapeutas sobre essa modalidade de atendimento.* ***Métodos:*** *Um questionário online foi criado e administrado para fisioterapeutas neuropediátricos brasileiros. O questionário consistiu em dados demográficos, questões sobre as características das consultas por telerreabilitação e percepção dos fisioterapeutas sobre a assistência via telerreabilitação.* ***Resultados:*** *Entre julho e setembro de 2020, 394 fisioterapeutas responderam o questionário. A maioria dos fisioterapeutas levaram de 21 a 30 minutos por sessão (26,9%), ofereceram uma sessão por semana (61,0%) e usaram mensagens eletrônicas como principal método de entrega (39,9%). A principal dificuldade reportada foi a falta de entendimento sobre os manuseios durante as sessões (41,2%) e problemas com a internet (16,7%). Além disso, a maioria reportou ser muito importante prover cuidados de saúde por telerreabilitação para a população economicamente menos favorecida.* ***Conclusão****: Os dados apresentados fornecem um entendimento do processo complexo e desafiador das consultas por telerreabilitação durante a primeira onda da pandemia da COVID-19. Apesar dos desafios reportados, a telerreabilitação pode ser uma oportunidade para melhor entender as atividades e participação das crianças no contexto do lar.*

Palavras-chave: *COVID-19. Reabilitação. Telerreabilitação. Pediatria.*

Introduction

Presenting the first cases in the city of Wuhan, China, in December 2019, the novel coronavirus (COVID-19) was declared a pandemic because of its rapid and devastating spread to the rest of the world.[1] COVID-19 transmission occurs through contact with airborne droplets of saliva or nasal mucosa, causing several symptoms such as fever, cough, fatigue, dyspnea, respiratory failure, and in aggravated cases, long periods of hospitalization that can lead to death.[2] Therefore, preventive measures such as social distancing and isolation were recommended by the World Health Organization (WHO) because of the increasing contamination rate and the lack of effective resources to prevent virus spread.[3]

Several countries seeking a reduction in incidences of viral contamination adopted the WHO recommendations.[4] The main public health measures adopted were mask use, quarantine implementation for infected patients, restriction on opening hours and operation of commercial establishments, and social distancing.[5,6] In view of the measures adopted, many changes occurred in several sectors, including the restriction of social and leisure activities and suspension of presential education.[4] In addition, suspensions and changes in the functioning of clinics and health services, such as physiotherapy and medical clinics, affected workers in this sector and people who depend on them.[7]

In Brazil, because of the worsening pandemic and measures of social isolation, in March 2020, through resolution nº 516, the National Federal Council of Physiotherapy and Occupational Therapy allowed possible virtual modality treatment. Two main approaches of telerehabilitation were established: (1) teleconsultation, which refers to virtual or not on-site clinical consultation as the first contact between the professional and the patient; and (2) telemonitoring, which is defined as the remote monitoring of patients who previously attended in person.[8] Faced with the need to use telerehabilitation as a viable way to maintain treatments without major damages to patients during the pandemic, many Brazilian physical therapists have adopted this new modality of treatment.[9,10]

As expected, several challenges were observed in implementing telerehabilitation in Brazil mainly because physical therapists and patients lacked experience.[10] Among the difficulties and challenges faced by physical therapists are communication between the physical therapists and the patient, internet quality, patient engagement, and data security.[7,11,12] Specifically, physical therapy for neuropediatric patients involves some other challenges because it requires the use of specific machines such as therapeutic electrical current, treadmill training, techniques and methods with touch, corrections of movements, and the performance of specific tasks.[13] Moreover, several of these patients

have difficulties in controlling movement, disturbance in communication, and, in some cases, cognitive dissonance, which will make it necessary for a person in charge to assist them with therapeutic exercises during the telerehabilitation session.[14,15]

Although telerehabilitation promotes proximity to the child's environment and the parents and is an excellent opportunity to implement therapies that are family-centered and focused on activity and participation in the patient's own home,[13,16] points mentioned above as challenges aligned with lack of experience may make telerehabilitation a challenging and complex process for therapists and families.

Seeking to better understand the scenario faced by Brazilian neuropediatric physical therapists, this cross-sectional web survey aimed to: (1) report the characteristics and challenges of telerehabilitation consultations during the pandemic, and (2) to expose the perceptions of physical therapists, who treated children with neurological disabilities, about telerehabilitation.

Methods

This study is reported according to recommendations of The Checklist for Reporting Results of Internet E-Surveys (CHERRIES).[17]

Study design

This study was a cross-sectional web based survey of Brazilian physical therapists that treat children and adolescents with neurological disabilities during the COVID-19 pandemic. The study protocol was approved by the Research Ethics Committee of the Centro Universitário Unifacvest (protocol number: 4.085.702/ CAAE: 33265920.7.0000.5616).

Participants

Physical therapists eligible to participate in this study were licensed by the Brazilian Physical Therapy Registration Boards (*Conselho Regional de Fisioterapia e Terapia Ocupaciona* - CREFITO) and remotely treated children with neurological needs via telemonitoring consultations – a modality of telerehabilitation adopted in Brazil – during the pandemic period. Additionally, participation was voluntary, and consent was implied by electronically signing in at the beginning of the survey.

Neuropediatric physical therapists across Brazil were recruited between July and September 2020. To get a large and representative sample that reflects the reality of the different regions of Brazil, various strategies and diverse sources of recruitment were employed. Physical therapists received invitations with a link to an electronic survey questionnaire (Google Forms) sent by social media (Facebook and Instagram) linked to pediatric rehabilitation, divulgation from the CREFITO on the webpages of 11 states in five different Brazilian regions, e-mails to associated members of the Brazilian Association of Neurofunctional Physiotherapy (ABRAFIN), and e-mails to physical therapists from the Associação de Pais e Amigos dos Excepcionais (APAE Brasil) (Brazilian social organization that assists children with special needs). We did not offer any payment or incentive for participating.

Procedures

We developed an open electronic survey questionnaire in Google Forms utilizing previously published studies about telehealth.[18,19] The survey was reviewed by two experienced neuropediatric physical therapists, and all suggestions were considered for the elaboration of the final version of the survey. The survey was tested by the research team before being unrestricted for public use, and adaptive questioning was used to reduce the number and complexity of the questions each respondent received. Therefore, the number of items in the questionnaire and pages changed based on each respondent's response.

The questionnaire included the following sections: (1) a brief description of the research purpose and procedures and the informed consent form; (2) social demographics and professions, such as sex, age, year of graduation, specialization courses in the area, and workplace; (3) specific questions about the characteristics of the treatment during/in the pandemic period: how many children were treated, duration of telerehabilitation, impact on fees, type of telerehabilitation offer, instruments used during consultations, previous training, main difficulties, and the possibility of continuing telerehabilitation after the pandemic, among others; and (4) a five-point Likert questionnaire on the perceptions of the use of telemonitoring. This questionnaire consisted of perceptions of knowledge, advantages, disadvantages, necessity, and technology security about telemonitoring consultations.[18] All respondents had the option to change prior answers by using a back button.

Data analysis

Data were exported from the survey form and imported into statistical software (IBM SPSS - Version 22.00) for analysis. Descriptive analysis, frequency, and percentage measures were used to characterize the demographics, professions, and perceptions of the participants.

Results

A total of 686 visits to the questionnaire link were recorded, of which 37 were not physical therapists, 42 did not provide their professional registration number, 203 did not provide physical therapy via telerehabilitation consultations to children with neurological conditions during the pandemic, and 10 were duplicates. These data were excluded. Thus, the final sample consisted of 394 participants. Given the multiple routes to dissemination of the survey, it was not possible to estimate the response rate.

Demographics

Most of the physical therapists were female (n = 332, 84.9%), from the Southeast Brazilian region (n = 185, 46.9%), and aged 22 to 63 (36.57 ± 7.9), most of whom cited long-term courses in neuropediatric rehabilitation as their specialization study (> 30 hours) (n = 177, 53.6%) and nonprofit organizations as their workplace (n = 159, 40.8%) (Table 1).

Table 1 - Demographic and professional characteristics (n = 394)

Characteristics	Frequency n (%)
Sex*	
Female	332 (84.9)
Male	59 (15.0)
Age (Mean ± SD)	36.5 ± 7.9 years
Region of practice	
Southeast	185 (46.9)
South	136 (34.5)
Midwest	24 (6.0)
Northeast	34 (8.6)
North	15 (3.8)
#Specializations in the neuropediatric rehabilitation field**	
Doctoral degree	11 (3.3)
Master's degree	28 (8.4)
Healthy residency program	10 (3.0)
Specialization course in pediatric rehabilitation or related areas (Lato sensu)	116 (35.1)
Specialization course in pediatric rehabilitation or related areas (Stricto sensu)	27 (8.1)
Specialty certification in children and adolescents neurofunctional physical therapy (COFFITO - ABRAFIN)	33 (10.0)
Long-term courses in the area (more than 30h)	177 (53.6)
Short-term courses in the area (less than 30h)	160 (48.4)
Workplace	
Hospital	1 (0.2)
Rehabilitation Center	69 (17.7)
Private Clinic	39 (10.0)
Universities or Research Centers	15 (3.8)
Nonprofit organization/association	159 (40.8)
Other	106 (27.2)

Note: *Three missing. **Five missing. #Categories are not mutually exclusive; SD = standard deviation; ABRAFIN = Brazilian Association of Neurofunctional Physiotherapy; CREFITO = Brazilian Physical Therapy Registration Boards.

Profile and characteristics of telemonitoring practice

Most of the physical therapists treated more than 30 kids per week previously the pandemic (n = 118, 30.1%). During the pandemic, the highest frequency reported was 6-10 kids per week (n = 91, 23.1 %). Additionally, most physical therapists reported that the pandemic did not change the fees charged (72.1%) (Table 2).

Most physical therapists took 21 to 30 minutes per telerehabilitation session (26.9%), and most of them offered one session per week (61.0%). Additionally, most respondents used combined synchronous and asynchronous methods (42.64%), and the delivery method more frequently used was electronic messages (39.8%) (Table 2).

The person responsible for helping children during telemonitoring in most cases was the mother (97.9%). The main instruments used in these sessions were the therapist's own body (67.5%) and balls, rolls, and benches (66.4%). Additionally, the most reported difficulties by physical therapists were the lack of understanding by parents, guardians, or caregivers in specific handling (41.2%) and problems with Internet connection during telerehabilitation sessions (16.7%) (Table 2).

Most physical therapists reported that the workplace offered conferences or meetings about the telerehabilitation sessions (66.0%). However, most respondents reported that if telerehabilitation modality needs legal authorization after the pandemic period, they will not use it (52.7%) (Table 2).

Table 2 - Characteristics of telemonitoring assistance (n = 394)

Questions about telemonitoring delivery assistance	Frequency n (%)
How many children per week did you attend to before the social distancing period?	
0 – 2 children	9 (2.3)
3 – 5 children	17 (4.3)
6 – 10 children	51 (13.0)
11 – 15 children	50 (12.7)
16 – 20 children	69 (17.6)
21 – 30 children	78 (19.9)
> 30 children	118 (30.1)
During the pandemic caused by COVID-19, how many children per week have you assisted through the telemonitoring modality?	
0 – 2 children	26 (6.6)
3 – 5 children	75 (19.0)
6 – 10 children	91 (23.1)
11 – 15 children	67 (17.0)
16 – 20 children	54 (13.7)
21 – 30 children	34 (8.6)
> 30 children	47 (11.9)
What is/was the average duration of your telemonitoring sessions?	
0 – 10 minutes	84 (21.3)
11 – 20 minutes	104 (26.4)
21 – 30 minutes	106 (26.9)
31 – 40 minutes	46 (11.6)
41 – 50 minutes	32 (8.1)
> 50 minutes	22 (5.5)
How many weekly telemonitoring sessions per patient do/did you perform?*	
0 – 1 session	240 (61.0)
2 – 3 session	138 (35.1)
0 – 1 session	240 (61.0)
2 – 3 session	138 (35.1)

Table 2 - Characteristics of telemonitoring assistance (n = 394) (Continued)

Questions about telemonitoring delivery assistance	Frequency n (%)
Which option best fits the fees charged for a telemonitoring session?**	
There was a decrease in the amount charged per session	89 (27.2)
The amount charged per session stayed the same	236 (72.1)
There was an increase in the amount charged per session	2 (0.6)
Which of the following telemonitoring delivery modes have you used most with your patients?	
Phone calls	16 (4.0)
Messages (e.g., WhatsApp, E-mail, SMS)	157 (39.8)
Videoconferences (e.g., Zoom, FaceTime, Skype, Hangouts Meet, WhatsApp calls)	110 (27.9)
Other smartphones apps	2 (0.5)
Combination among the interfaces	109 (27.6)
Which method of telemonitoring have you used most?	
Synchronous	116 (29.4)
Asynchronous	110 (27.9)
The use of both methods was equivalent	168 (42.6)
Has there been a conference, lecture, or meeting at your workplace in relation to telemonitoring adoption?†	
Yes	259 (66.0)
No	133 (33.9)
Do you use/used any specific instrument such as dolls, balls or other materials to demonstrate exercises and handling the patients to those responsible? Indicate which of them:	
Cloth dolls	176 (45.3)
Toys	199 (51.2)
Balls, rolls and benches	258 (66.4)
Therapist's own body	262 (67.5)
Draws	99 (25.5)
Internet videos	165 (42.5)
Others	69 (17.7)
#Which of these relatives/caregivers are/were responsible for helping children during therapy via telemonitoring?	
Cloth dolls	176 (45.3)
Toys	199 (51.2)
Balls, rolls and benches	258 (66.4)
Therapist's own body	262 (67.5)
Draws	99 (25.5)
Internet videos	165 (42.5)
Others	69 (17.7)
What is the main difficulty you have had in using telemonitoring?	
Difficulty connecting to the internet	65 (16.7)
Lack of understanding by parents, guardians, or caregivers about specific handling	160 (41.2)
Misuse of applications and guidance interfaces	7 (1.8)
Lack of commitment to pre-established times for the start and end of telemonitoring	33 (8.5)
Distractions in the environment	21 (5.4)
Non-availability of specific materials and devices	54 (13.9)
Others	48 (12.3)
Would you continue to provide physical therapy assistance via the telemonitoring modality if there were legal authorization after the pandemic period?	
Yes	186 (47.2)
No	208 (52.7)

Note: *One missing. **67 missing. †Two missing. #Categories are not mutually exclusive.

Knowledge of telemonitoring technology and physical therapists' perceptions about telemonitoring necessity

Most of the physical therapists reported an average previous familiarity with tools used in telemonitoring (48.4%). The majority knew very little about the use of telemonitoring in other countries (40.2%). Additionally, most of them thought that the use of continuous education on telemonitoring for neurofunctional physical therapists is crucial (50.5%) (Figure 1A). Most physical therapists reported that telemonitoring is highly needed in patient care (55.8%) and, in the same way, consider its high importance in economically disadvantaged patient care (47.4%). Most responders reported that telemonitoring is significantly essential to the healthcare of patients living in remote areas (52.9%) (Figure 1B).

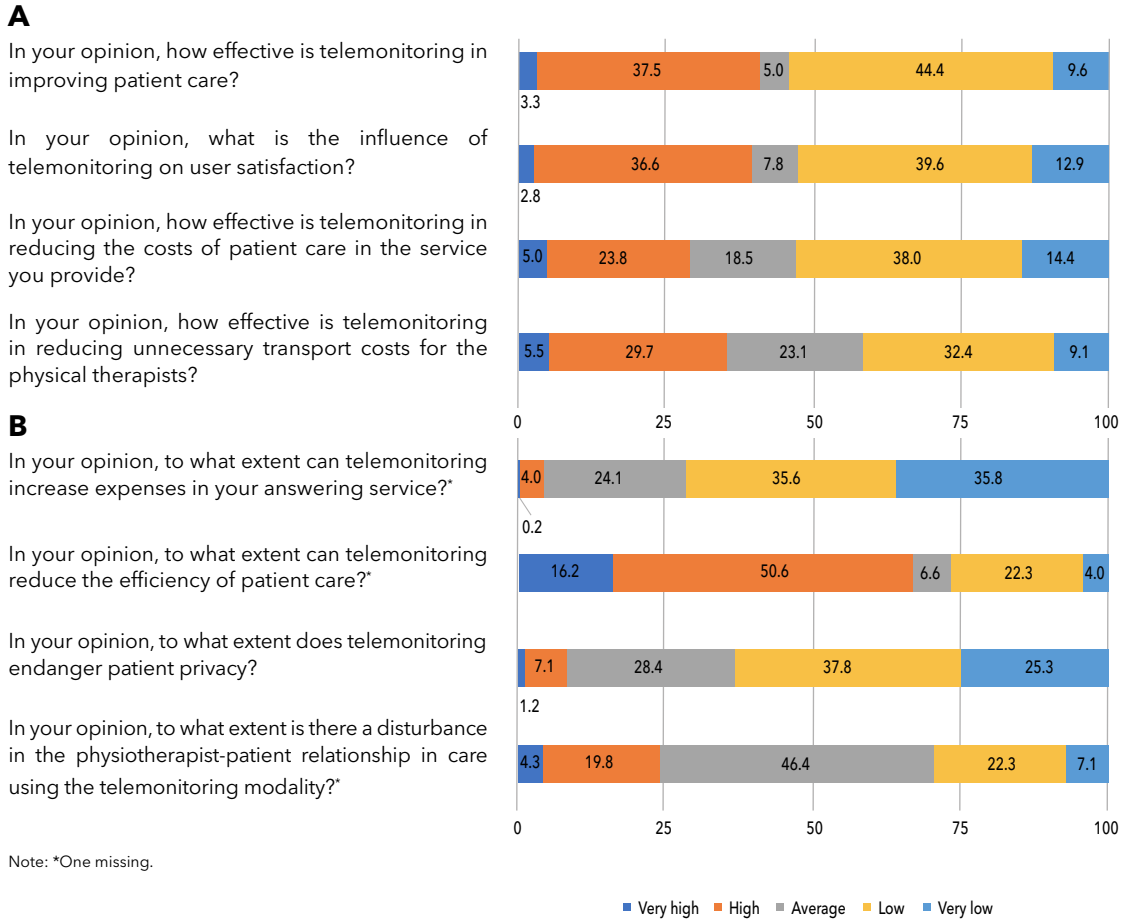

Figure 1 - Physical therapists' perceptions about telemonitoring consultations. **A -** Knowledge of telemonitoring technology. **B -** Physical therapists' perceptions about telemonitoring necessity.

Physical therapists' perceptions about the advantages and disadvantages of telemonitoring

Most responders reported that the use of telemonitoring has low impact in cost in terms of their own transport (32.4%) and that of the patient (38.0%). The physical therapists mostly believe that telemonitoring causes low patient satisfaction (39.6%), and that it leads to low effectiveness in patient care (44.4%) (Figure 2A).

Most responders reported that the physical therapist-patient relationship is disturbed (46.3%). Physical therapists stated that the risk of telemonitoring endangering patient privacy is low (37.8%). In relation to effectiveness, most responders believed that telemonitoring significantly reduces the effectiveness of patient care (50.6%). In the perception of service costs, most responders reported a low increase in service costs (35.8%) (Figure 2B).

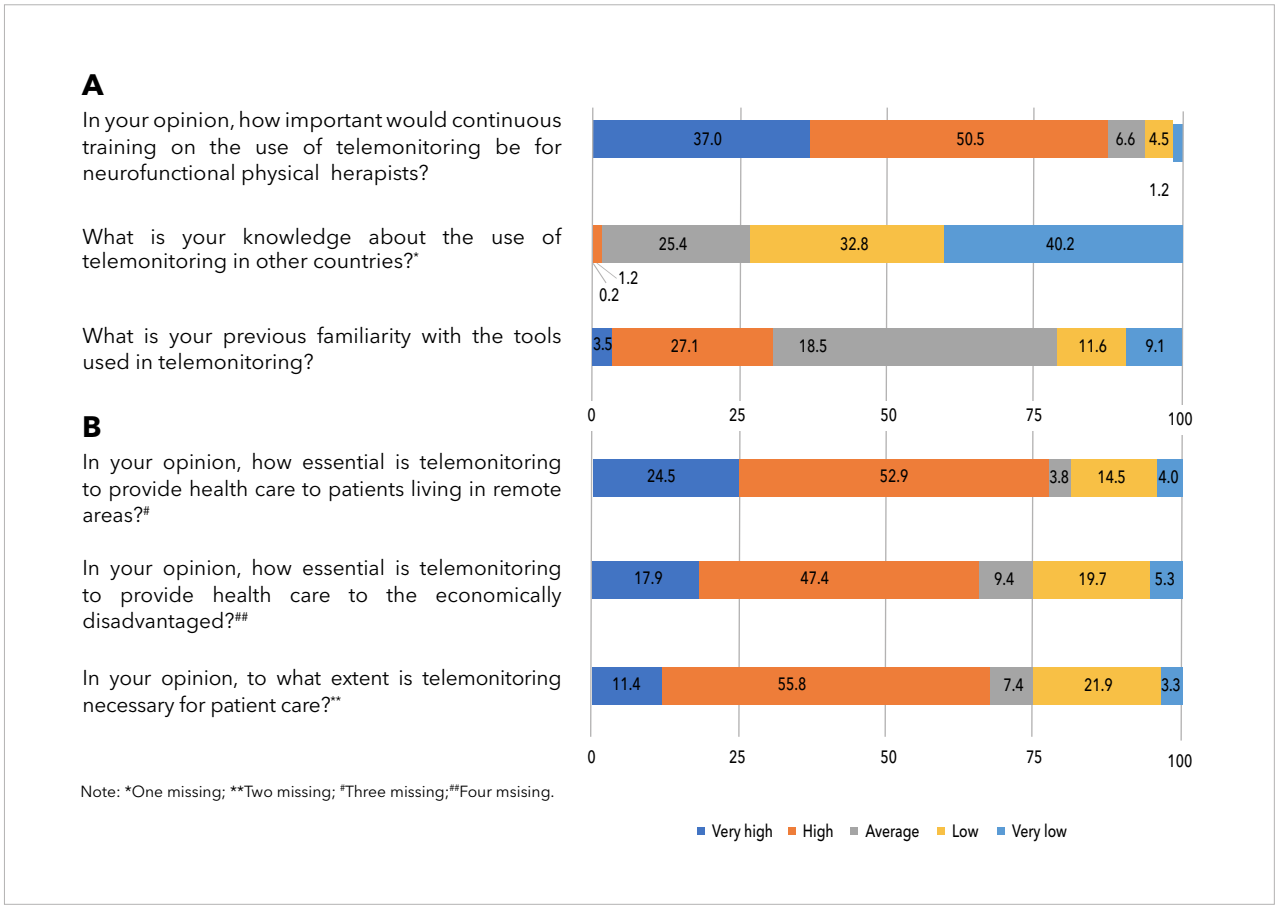

Figure 2 - Physical therapists' perceptions about telemonitoring consultations. **A -** Physical therapists' perceptions about the advantages. **B -** Physical therapists' perceptions about the disadvantages of telemonitoring.

Physical therapists' perceptions about telemonitoring technology security

The majority of the physical therapists reported that specific security policies and guidelines are highly necessary for the use of telemonitoring (55.6%) and consider that it is critical to create a structure to prevent the breach of confidential data when using telemonitoring (46.6%).

Additionally, most respondents declared it is highly important to provide legal clarifications to patients treated via telemonitoring (54.7%) and to store telemonitoring data in the cloud or a backup (50.3%) (Figure 3).

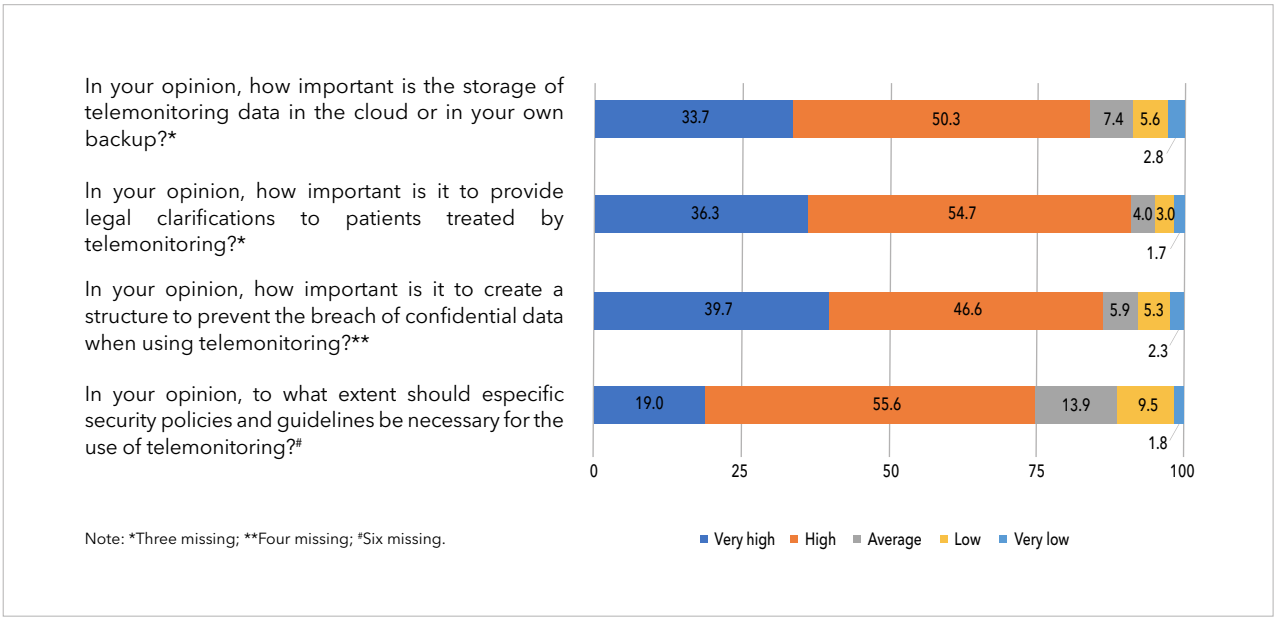

Figure 3 - Physical therapists' perceptions about telemonitoring technology security.

Discussion

The COVID-19 pandemic brought several challenges and discussions about the use of telerehabilitation in Brazil and in several other countries that implemented this modality of treatment during the pandemic. Specifically, in neuropediatric rehabilitation, there are a few studies on the effectiveness and perceptions of physical therapists and patients' families on telerehabilitation.

In this study, Brazilian physical therapists were surveyed regarding their consultations via telemonitoring in the rehabilitation of neuropediatric patients during the pandemic and their perceptions of this modality of physical therapy consultation. Regarding the profile and characteristics of telemonitoring, we can highlight the following findings: most physical therapists treated a reduced number of children during the pandemic period; the most common delivery mode of telemonitoring adopted was electronic messages, provided through the combination of synchronous and asynchronous methods; mothers, followed by fathers, were the children's guardians who helped most during the sessions; the main difficulties faced by physical therapists during telemonitoring sessions were parents', guardians', or caregivers' lack of understanding about specific handling and quality of internet connection during telemonitoring sessions. Moreover, more than half of the responders reported that telemonitoring reduces the efficiency of patient care. Most of the physical therapists stated that it is highly important to provide healthcare via telemonitoring to the economically disadvantaged and patients who live in remote areas. Additionally, the physical therapists reported that measures involving data security and patient privacy are essential.

Characteristics of telerehabilitation sessions during the pandemic

Although expected, one of the results that caught our attention was the decrease in the number of children consultations by physical therapists during the pandemic. The percentage of physical therapists who assisted more than 30 children with neurological conditions per week decreased from 30.1% before the pandemic to 11.9% during the pandemic. In addition to the negative economic impact of the pandemic in Brazil,[20] which could explain the lower number of consultations, this data may also be linked to one of the characteristics of the respondents. Forty percent of the physical therapists are linked to nonprofit associations, which generally serve children of families with lower economic status. Perhaps also for this reason, the combination of synchronous and

asynchronous methods has been the most cited (42.6%). Electronic messages, such as those via WhatsApp, a popular source of electronic communication among different economic classes in Brazil, were the most used delivery mode of telemonitoring (39.8%), probably for the same reason cited above.

A large proportion of children with neurological disorders will need a caregiver or responsible adult present at telerehabilitation sessions. In most cases, this would be the mother, who, in low- and middle-income settings, are often burdened with caring for the family and the child with neurological conditions.[21] This data was also observed by the physical therapists in our study during telemonitoring sessions. A study investigating potential healthcare issues related to the well-being of disabled children and rehabilitation during the COVID-19 outbreak also reported that caregivers who helped the most during the telerehabilitation sessions were mothers followed by fathers.[22] Studies demonstrated that the caregivers of children with disabilities presented highest levels of anxiety, depression and stress symptoms during the COVID-19 pandemic; these signs are related to the child's level of physical disability and to physical, social, psychological, and financial challenges faced by the family.[23,24] These data are relevant because the burdens on the caregivers of children with disabilities could impact negatively in the care of these children and may decrease adherence in telerehabilitation sessions.[23-25] Longo et al.[26] observed that the increasing use of telerehabilitation during the pandemic could be an excellent opportunity to stimulate family-centered practice in children with neurological diseases; indeed, the active participation of other family members in the care process, and the understanding of the routines and preferences of children and family could mitigate the challenges generated by the pandemic in the care process.[26-28]

The main difficulties reported by the physical therapists were the lack of understanding by parents, guardians, or caregivers in therapeutic handling during the telemonitoring sessions and internet connection problems. Some studies reported that clinical practice performed by physical and occupational therapists with neuropediatric patients involves a hands-on approach in several interventions with significant physical contact between therapists and patients;[15,29,30] this is possibly one of the main issues for adaptation to telerehabilitation faced by the physical therapist professionals. An Italian survey that investigated parents' feedback about a telerehabilitation program during the COVID-19 pandemic for children with disabilities observed that 22% of parents reported difficulties to following therapist instructions.[31] It is important to highlight that patient characteristics can be a barrier to the successful use of telerehabilitation sessions, and the presence of a parent or a trained adult is essential to the receiving end of the therapy, mainly for safety reasons.[23,30] The lack of understanding of parents, guardians, or caregivers in therapeutic handling could be related to their lack of experience in this modality of physical therapy consultation, causing difficulties in achieving simple and assertive handling/exercise; this may also be related to the non-sharing of responsibilities for the therapeutic process with the family. A few decades ago, the role of the family in the process of physical rehabilitation of children with disability was seldom discussed; the goals and treatments were defined by the physical therapist and the responsibilities for the clinical progress of the child were associated, in a unidirectional way, to the rehabilitation team performance.[32-34] Currently, there is a common understanding that physical therapy treatment for children with disabilities should follow a family-centered approach, thereby generating a sense of responsibility and empowerment for the patient's family.[34] This approach enables a two-way interaction between the family and the therapist, where goals, desires, preferences, responsibilities, assessment, and implementation of therapy are shared;[27,34] the adoption of this approach may provide a better way to align the therapeutic and family expectations and help mitigate some of these burdens caused by the pandemic period.[35]

The second most reported difficulty pertained to internet connection (16.7%). In a case report, one of the main problems in telerehabilitation sessions was slow internet.[36] In a study designed to describe the process and cost of delivering a physical therapist telehealth exercise program for older adults with functional limitations, Middleton et al.[37] reported that concerns pointed out by providers and participants were reliable access to internet or cellular services and costs of data streaming internet/cellular and bandwidth requirement. In a systematic review exploring the challenges of telerehabilitation in the Philippines, authors reported that out of 18 studies that reported technical challenges in telerehabilitation, ten pointed out slow internet speed.[36]

Additionally, the major barrier to telehealth adoption in another systematic review involved some aspect of the internet.[38] Because of economic differences among the different regions of Brazil and the quality of the internet, this point has been considered by physical therapists who answered the survey. This result may also be found in countries with similar or lower economic and characteristics than Brazil.[24,26,36]

Physical therapists' perceptions about telerehabilitation consultations

Some authors reported that one of the main barriers to adopting telehealth and telerehabilitation by health professionals involved the perception of ineffective treatments in this type of care and resistance to technology.[38,39] In our study, most physical therapists reported that telemonitoring greatly reduces efficiency in patient care. Although telerehabilitation has been studied for some decades, in the pediatric neurorehabilitation field there are still doubts regarding its effectiveness in various outcomes and pathologies. A recent systematic review exploring the use of telehealth in children with disabilities reported 17 studies, four of which explored telerehabilitation use in patients with neurological conditions.[40] Although Camden and Silva[40] have shown some benefits of telerehabilitation in children with motor repercussions, the results do not reflect the variety of diseases and outcomes that we have in this field of rehabilitation. In addition to the doubt about the effectiveness of telerehabilitation, other important point it is the resistance to change. Several studies pointed that the resistance to online consultation is one of the main internal barriers in telerehabilitation practice; in most cases this resistance was related with concerns about investments in equipment, limited technology literacy, clinician perception of impersonal care, and limitations of a technically challenged staff.[38,41,42]

In the Brazilian scenario, the resistance could be greater due to the short period of permission to use telerehabilitation, March 2020, and for socioeconomic issues faced by Brazilians due to the pandemic period.[8,20] Further studies exploring the effectiveness of telerehabilitation on other childhood pathologies and outcomes are important for greater safety in the use of telerehabilitation by physical therapists, as well as studies investigating the barriers that influence the use of telerehabilitation in Brazil.

Brazilian physical therapists claimed that telemonitoring is highly essential to provide healthcare to the economically disadvantaged (47.4%) and to patients living in remote areas (52.9%). Some studies exploring the use of telerehabilitation in rural and remote areas have demonstrated the benefits of its applicability in relation to the reduction of costs with the displacement of patients and professionals, as well as good levels of patient and therapist satisfaction.[43-45] This therapeutic alternative could be a great alternative for countries with continental dimensions such as Brazil and can even be used as a public policy for the Unified Health System (SUS) for vulnerable and remote areas. However, although our large territorial area is a shared characteristic with the United States of America,[45] Canada,[43] and Australia,[44] these countries do not share the same economic and internet-related problems we face. Investments in internet connection and economic support in disadvantaged areas could mitigate the negative impact caused by the pandemic on the families of children with neurological disorders in countries with similar backgrounds to Brazil.

One other concern was data security and patient privacy. More than half of the physical therapists (55.6%) reported the significance of specific security policies and guidelines for the use of telemonitoring, and most of them (46.7%) considered it essential to create a structure to prevent breaches of confidential data when using telemonitoring assistance. Indeed, this is one of the most reported concerns by providers and patients who use telehealth and telerehabilitation.[44,46] In a cross-sectional survey study in Saudi Arabia, authors investigated the knowledge and attitudes of rehabilitation professionals toward telerehabilitation. The providers considered that one of the main risks associated with telerehabilitation services concerns patient privacy.[47] In a survey performed in four different countries regarding consumer preferences and barriers to using mental health e-services, the security and confidentiality of personal information were the highest concerns across all countries.[48] Similar data was observed in a cross-sectional survey in Kuwait, where authors reported that most of physical therapist managers considered the patient's privacy and confidentially as important barriers in telerehabilitation.[49] Recently in Brazil, the General Data Protection Law (LGPD), which was approved and sanctioned in 2018, came into force in August 2020.[50] It is analogous to the General Data Protection Regulation

(GPDR) of the European Union and the Health Insurance Portability and Accountability Act (HIPAA) of the United States, and it can promote more security and legal aspects to the practice of telerehabilitation in Brazil.[51]

There are strengths and limitations to this study. Limitations include the absence of a survey response rate, no control of whether the physical therapists could answer the survey more than once, and the lack of reasons why telemonitoring was not adopted by physical therapists. In contrast, this is one of the first studies to collect the assistance profiles, characteristics, difficulties and perceptions of physical therapists who treated children with neurological disabilities via telerehabilitation.

Conclusion

In view of the urgency and challenges brought by the COVID-19 pandemic in the field of rehabilitation, this study sheds light on the profile and characteristics of telerehabilitation services and the physical therapists' perceptions of this modality. Although this study involved Brazilian physical therapists, some findings could be transposed to other countries with similar backgrounds, such as developing countries, and may help physical therapists, health managers, and future research regarding telerehabilitation for children with neuropediatric diseases.

Acknowledgements

We would like to thank the Physical Therapy Registration Boards (CREFITO of Alagoas, Paraíba, Rio Grande do Norte, Pernambuco, Bahia, Rondônia, Pará, Mato Grosso, Mato Grosso do Sul, São Paulo, Minas Gerais, and Rio Grande do Sul states), the Brazilian Association of Neurofunctional Physiotherapy (ABRAFIN) and the Association of Parents and Friends of Exceptional Children (*Associação de Pais e Amigos de Crianças Excepcionais* - APAE) for sending the link of the electronic survey to their members and collaborators. We would like to extend a special thanks to all the Brazilian physical therapists who answered the questionnaire and were involved in the assistance of children and adolescents with neurological conditions during the COVID-19 pandemic.

Authors' contribution

ALFM was responsible for the study conception and design, and for the manuscript draft (along with MESM) and revision. ALFM, MESM, SS and HSM substantially contributed to the acquisition, analysis, and interpretation of data.

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