Journal of Complementary Medicine Research, ISSN: 2146-8397 Vol. 14, No. 4, 2023 (pp. 22-28)

RESEARCH ARTICLE WWW.JOCMR.COM

Impact of COVID-19 on the Delivery of Physical Therapy Services for Children with Disabilities in Saudi Arabia

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ABSTRACT

Background: COVID-19 is a global pandemic. In Saudi Arabia a nationwide lockdown from April to June 2020 was imposed, with several cities experiencing 24-hour lockdowns. Due to the fear of spreading the virus, rehabilitation programs, including pediatric physical therapy, have been cancelled, postponed, or rescheduled. Purpose: to explore the impact of COVID-19 on the delivery of physical therapy services for children with disabilities.
Methods: In this five-part cross-sectional study, 80 participants completed a questionnaire about the effect of COVID-19 on the delivery of physical therapy services for their children.
Results: The results revealed that 33 (41.3%) of the 80 caregivers and their children who participated in the survey discontinued to physical therapy. The remaining 47 (58.8%) continued to receive physical therapy as follows: 28 (35%) continued through home-based physical therapy program, 11 (13.8%) continued through telerehabilitation services, 8 (10%) continued through both home-based physical therapy program and telerehabilitation services.
Conclusion: The majority of caregivers and their children participated in the study did not continue the physical therapy services and the reasons were high financial costs of physical therapy centers and fear of infection with COVID-19.

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How to cite this article: El-Shamy M S, Alghamdi S M, Alsaaidi A S, Zamzamy A H, Khayat M I, Wazirah M A, Alqthami T R, Albrnawi M T, Alharthi F M, Alnahas M N, Alsulami K A (2023), Impact of COVID-19 on the Delivery of Physical Therapy Services for Children with Disabilities in Saudi Arabia. Journal of Complementary Medicine Research, Vol. 14, No. 4, 2023 (pp. 22-28)

KEYWORDS:
COVID-19,
Physical Therapy Services,
Children with Disabilities,
Caregivers,
Telerehabilitation.

ARTICLE HISTORY:
Received: Apr 16, 2023
Accepted: May 19, 2023
Published: Jun 09, 2023

DOI:
10.5455/jcmr.2023.14.04.05

INTRODUCTION

Coronavirus Disease 2019 (COVID-19) has become a major health problem causing severe acute respiratory illness in humans [1]. In March 11, 2020, the WHO declared COVID-19 as a global pandemic. Consequently, many countries around the world enforced total or partial lockdown to countermeasure the spread of the disease [2]. In Saudi Arabia, a lockdown has been enforced country-wide in April to June 2020 and some cities underwent 24-hour lockdown like Makkah and Madinah started on 2 April while other cities like Riyadh and Jeddah the lockdown started on 6 April [3].

The lockdown enforced by government of Saudi Arabia led to closure of physical therapy (PT) centers given that PT is non-emergency service. Healthcare services are suddenly adjusting their delivery of care to protect patients and staff from contamination and to reallocate resources to the greatest urgent needs due to the COVID-19 pandemic [4, 5]. Eccleston et al. [5] reported that regular appointments for elective and non-emergency conditions have stopped in secondary and tertiary centers. Patients in need for primary healthcare visits were expected to maintain social distancing and extreme isolation procedures have been enforced in residential care facilities and hospices [5].

Rehabilitation services, including pediatric physical therapy have been canceled, suspended, or re-scheduled amid fear of spreading the infection. According to Cacioppo et al. [4], the lockdown led to the canceling and postponing of pediatric counseling for more than half of the children granting approximately half of the children physical therapy sessions continued and most of these sessions were performed by the parents [4]. In addition, Havermans et al. [6] pointed out that most children continued their physical therapy sessions by home physiotherapist though some adolescents have performed their physiotherapy program independently [6].

The lockdown causes massive impact on health systems which led to negative outcomes on the psychosocial status of patients and their families [7]. In spite of the fact that children health isn't directly affected in a similar way as adults by the COVID-19 pandemic, the estimates taken by governments to control the spread of the infection have a big impact on children with disabilities and their families [8]. For children with disabilities, inability to access rehabilitation services may cause loss of functional gains as they stayed at home during the time of lockdown. Many families proceeded with the treatment for their children at home. As a result, provision of rehabilitation services at home was a major burden for parents [4].

Before the COVID-19 pandemic, telemedicine and eHealth approaches were being created and tried slowly with many researches focusing on lessons learned and boundaries to utilizing advanced arrangements. Suddenly treating or supporting individuals with non-urgent and chronic conditions at a distance from healthcare providers has become essential. These situations prompt changes are occurring across medical services [5]. One branch of telemedicine is Telerehabilitation, which is a virtual conveyance of medical support to patients [9]. It includes the use of Information and Communication Technology (ICT) give an enormous scope of medical care to patients without specifically requiring the person to cooperate with the medical care provider, it may be an option in contrast to offering types of assistance to children with disabilities during the lockdown [10, 11].

Telemedicine is customarily partitioned into being concurrent or nonconcurrent. Concurrent is characterized as intelligent video associations communicating data in the two ways all the while. Nonconcurrent telemedicine portrays the store-and-forward transmission of clinical information in independent time spans [12]. Some different therapists found another and imaginative plans to convey treatment through instructional YouTube recordings, Pinterest pages with exercises for children to be done and web-based media were utilized to keep up correspondence among specialists and to share thoughts regarding telehealth techniques [8]. However, little is known about challenges experienced by parents when providing physical therapy services for their children during COVID-19 pandemic and whether children in Saudi Arabia received any telerehabilitation services. Therefore, this study aimed to describe the challenges experienced during COVID-19 pandemic and its impact on physical therapy services for children with disabilities.

METHODS

Design and Participants

A cross-sectional design was used in this study. The study was approved by the Research Ethics Committee at Umm Al-Qura University (HAPO-02-K012-2020-11-493). Participants were caregivers of children with disabilities residing Saudi Arabia. The inclusion criteria were: 1) children aged from 0 to 18 years; 2) children who received physical therapy services within the last year; 3) caregivers who are able to read Arabic language. The exclusion criteria were: 1) children who didn't receive physical therapy services within the last year and 2) caregivers who're unable to communicate in Arabic.

Children had a mean of 7.73 (4.10) and 54% were males. level of disability (n=80) play an important role in receiving physical therapy services during COVID-19 pandemic. Children's level of disability was mild (29%), moderate (60%), severe (11%). Mothers (89%) represented the primary caregiver of the children (primary caregiver is the person accompanying the child most of the time). Majority of participants were from Western region (82.5%). Full demographic information is presented in Table 1.

Questionnaire Development

The authors developed a questionnaire for the purpose of the study. The questionnaire consists of five parts and a total of 47 items. The first part (15 items) is used to collect child and caregiver characteristics such as age, gender, education level. The second part (5 items) is to explore the reasons for discontinuing physical therapy services during the pandemic. The third part (6 items) is to explore nature of home-based physical therapy programs. The fourth part (7 items) to explore the challenges facing the caregivers during the home-based physical therapy program.

The fifth part (14 items) is to explore telerehabilitation services provided to children during the pandemic. Items in parts 2 to 5 are rated using five-point agreement scale (strongly agree to strongly disagree).

Procedure

An online form of the questionnaire (Google Forms) was used to collect data from participants. The questionnaire link was distributed via social media. A pilot study was conducted on (6) participants to examine clarity, comprehensibility and duration of time required to answer the questionnaire. Minor corrections (language and online settings of the questionnaire) were done based on the results of the pilot study.

Data analysis

Descriptive statistics is used to compute all variables. Items in parts 2 to 5 of the survey were summarized. A binomial logistic regression was used to explore the effects of child's age, gender, level of disability, type of disability, caregiver's working status, family income, and household size on the likelihood that children discontinued PT services. Items rated highly (agreement or disagreement) by caregivers were further investigated by examining correlation between such items and demographic information of the child and family, using Pearson, Spearman's, or Kindall's tau, as deemed appropriate. Alpha level was set at 0.05. SPSS (Version 24) was used for all data analyses.

RESULTS

Status of physical therapy services during COVID-19 pandemic

Of the total of (80) caregivers and their children participated in the study, 33 (41.3%) children discontinued their physical therapy sessions. The remaining 47 (58.8%) continued physical therapy services as follows: 28 (35%) continued through home-based physical therapy program, 11 (13.8%) continued through telerehabilitation services, 8 (10%) continued through both home-based physical therapy program and telerehabilitation services.

Table 1: Child and caregiver's demographic information.

Variables	Description	Data
Child age in years (n=78)	Mean (SD)	7.73 (4.10)
child's sex (n=80)	Male	43 (53.8)
	Female	37 (46.3)
Disability type (n=79)	Physical	31 (39.2)
	Combined Physical & Intellectual	11 (13.9)
	Intellectual/ Cognitive	27 (34.2)
	Sensory	3 (3.8)
	Others (unspecified; genetics)	7 (8.9)
Level of disability (n=80)	Mild	23 (28.8)
	Moderate	48 (60.0)
	Severe	9 (11.3)
Child's education level (n=80)	Not studying	27 (33.8)
	Preschool	15 (18.8)
	Elementary school	32 (40.0)
	Middle School	5 (6.3)
	High school	1 (1.3)
Primary caregiver (primary caregiver is the person accompanying the child most of the time) (n=80)	Mother	71 (88.8)
	Father	2 (2.5)
	Other	7 (8.8)
Marital status of primary caregiver (n=78)	Single	5 (6.4)
	Married	62 (79.5)
	Divorced	8 (10.3)
	Widowed	1 (1.3)
	Other	2 (2.6)
Education level of primary caregiver (n=78)	less than high school graduates	7 (9.0)
	Highschool graduate	14 (17.9)
	Undergraduate	51 (65.4)
	Postgraduate	6 (7.7)
Caregivers Occupation (n=78)	Unemployed	46 (59.0)
	Part time job	15 (19.2)
	Full time job	17 (21.8)
Family income level (Saudi riyal) (n=80)	less than 3000	9 (11.3)
	from 3000 to less than 6000	14 (17.5)
	from 6000 to less than 9000	20 (25.0)
	from 9000 to less than 11,000	15 (18.8)
	more than 11,000	22 (27.5)
Residence (n=80)	Central Region	4 (5.0)
	Western Region	66 (82.5)
	Eastern Region	8 (10.0)
	Northern Region	1 (1.3)
	Southern Region	1 (1.3)
Household size (n=70)	Median (min – max)	5 (1-14)

Predictors of discontinuing physical therapy services

Figure (1) shows the highly rated items of reasons for discontinuing physical therapy services. (54.5%) of participants who didn't continued physical therapy refer the reason to the fear of infection with COVID-19 in first place, and second to the financial costs of physical therapy services (48.5%).

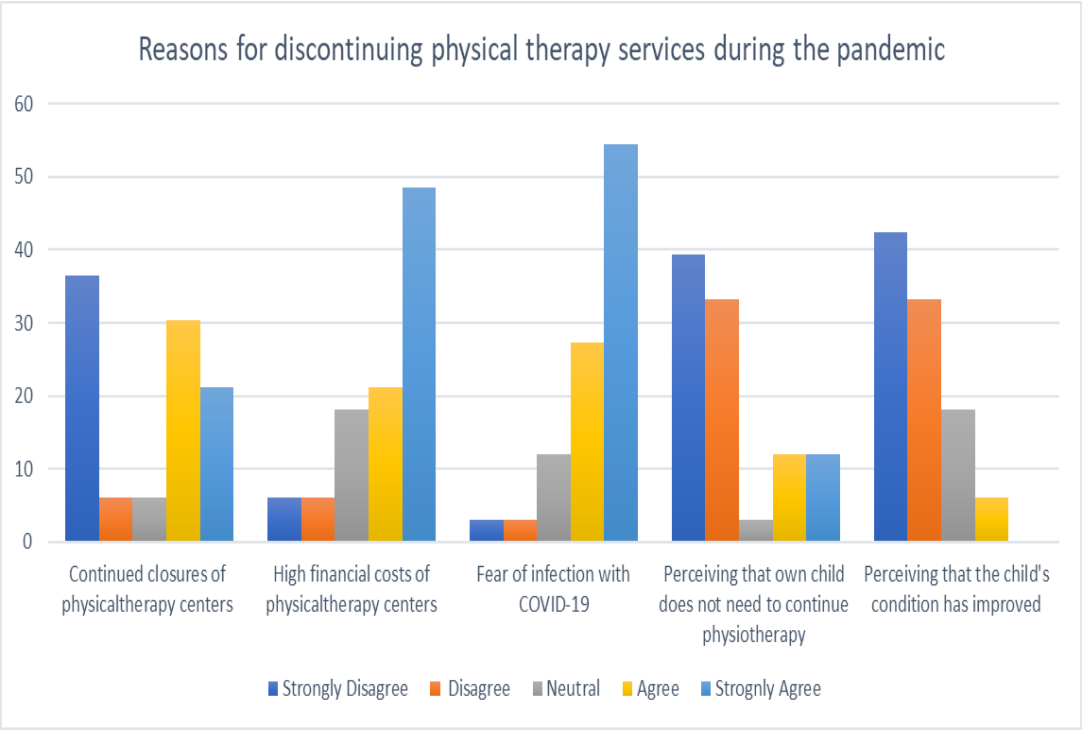

Figure 1: Reasons for discontinuing physical therapy services

There was significant positive low correlation between fear of infection with covid-19 and child's age (r= 0.39, p= 0.027) and disability type (r= 0.43, p= 0.014). There was significant negative low correlation between the financial costs of going to government clinics and private physical therapy centers were high and Family income level (r= -0.36, p= 0.04).

Table 2 shows the logistic regression model was statistically significant, x2(7) = 23.22, p =0.002. The model explained 40% (Nagelkerke R2) of the variance in discontinuity of physical therapy services. Of the 8 in the model, only three were statistically significant: caregiver's working status, household size and disability type (Table 1). Employed caregivers had 7.7 times higher odds to discontinue physical therapy services of their child more than unemployed caregivers. Increasing number of household size was associated with an increased likelihood of discontinue physical therapy services; however, odds ratio was only 0.69. Disability type was associated with discontinuity of physical therapy services.

Table 2: Logistic regression to predict likelihood of discontinuing of physical therapy services.

	B	S.E	Wald	Df	P value	Odds ratio	Lower limit	Upper limit
Child's Age	-0.088	0.088	0.998	1	0.318	0.915	0.770	1.089
Child's Sex	0.751	0.638	1.387	1	0.239	2.119	0.607	7.392
Type of disability	-0.815	0.286	8.118	1	0.004	0.443	0.253	0.776
Level of disability	0.374	0.574	0.425	1	0.514	1.454	0.472	4.480
Caregivers working status	2.036	0.809	6.331	1	0.012	7.661	1.568	37.421
Family income level	-0.541	0.288	3.540	1	0.060	0.582	0.331	1.023
Household size	-0.372	0.186	3.995	1	0.046	0.689	0.478	0.993
Constant	2.034	1.911	1.133	1	0.287	7.641	0.472	4.480

B: Unstandardized beta SE: Standard error Wald: Statistical test
Df: Degrees of freedom

Physical therapy services received during COVID-19 Pandemic

Figure (2) shows that most of the participants (51.1%) agreed that the components of the home therapy program were obvious and (44.7%) agreed that they received instructions from a physical therapist to follow a home treatment program. There was significant negative low correlation between the components of the home therapy program were obvious and level of disability (r= -0.35, p= 0.02). There was non-significant correlation between receiving instructions from a physical therapist to follow a home treatment program and child's demographic.

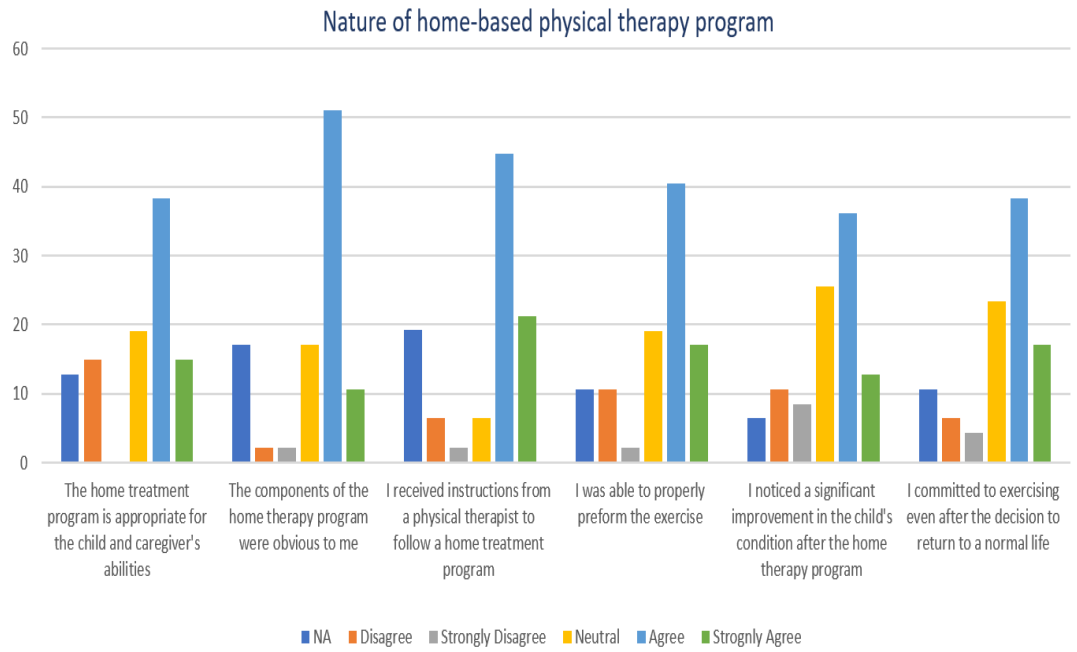

Figure 2: Nature of home-based physical therapy program

Figure (3) shows that most of the participants (44.7%) agreed that they spent a large amount of money tools for home program which represent a challenge for them. In construct, (36.2%) of them disagreed that the home environment is one of the challenges they face during home-based program.

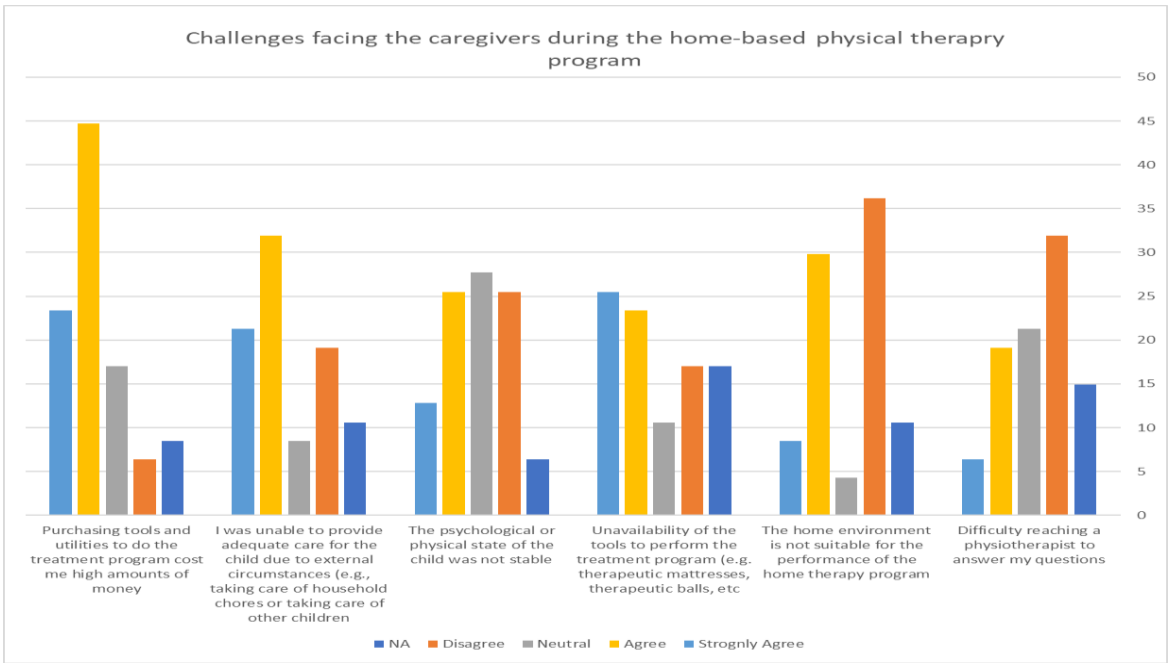

Figure 3: Challenges facing the caregivers during the home-based physical therapy program

There was significant positive low correlation between spent a large amount of money on tools for home program and child's Sex (r= 0.31, p= 0.04), disability type (r= 0.31, p= 0.04) and household Size (r= 0.38, p= 0.02). Of the total sample (80), only 19 reported that they use telerehabilitation services. However, data in telerehabilitation is not shown because majority of items related to telerehabilitation were rated as "not applicable". In addition, correlation analyses were not computed given the low responses in this part of the survey.

DISCUSSION

This study explored the challenges experienced during COVID-19 pandemic and its impact on physical therapy services for children with disabilities. The results of this study revealed that

discontinuing physical therapy services during the pandemic is due to the fear of infection and the high financial costs of going physiotherapy centers. Also, the findings demonstrated three factors contribute mainly to the discontinuing of physical therapy services during the pandemic: type of disability, caregivers working status, and household size (Table 2) .

The findings of the study show that 51.1% of the participant find that the home program was easy for them to understand and obvious for them. Also, 44.7% of the participant choose to receive more instructions about the home-based program (Figure 2). One of the solutions of this problem that we found in other study is to include the parents or caregivers in the process of building the home-based exercise program to support therapy within their everyday routine and resolve any obstacles that might occur. Also, physical therapist should aim to develop successful teaching approaches to encourage active parental participation in their child's treatment program, according to the results [14]. It is important to place the therapy program at home in the consider of the family's general needs and goals, it's important to consider the family circumstances during the pandemic .

Effective home program includes five steps: Five measures make up a successful home program: 1- creating a joint partnership in which parents are the experts in understanding their child and their home environment; 2- making the child and family (rather than the therapist) set expectations for what they want to develop; and 3- having the child and family (rather than the therapist) set goals for what they want to improve. ; 4- providing daily guidance and coaching to the family in order to recognize the child's progress and change the program's complexity as needed; and 5- assessing the results as a team [15].

One of the advantages of home-based exercise program that they can be closer to their relatives, therefore most patients and caregivers prefer it. This may be due to the deep relationships that exist within the extended family structure, which could help them perform better [16].

The main challenges facing caregivers was spending money on physical therapy tools (44.7% of participants), and it was finding that the home environment is suitable for performing the home therapy program for 36.2% of the participants. Comparing the findings of this study with previous results, the caregivers were unsatisfied about the home environment for performing exercise program, worried about therapy prescription, fear of causing harm, and feelings of insecurity [14]. Lack of time, forgetfulness, exhaustion, difficulty fitting program into their everyday routine, and the lack of clarification about who is responsible for the home exercise program [17].

The finding of the study showed that only 19 from 80 of the participants received telerehabilitation which considered surprisingly low in compared to other studies. As telerehabilitation has the potential to substantially increase access to rehabilitation therapy on a large scale, also due to a lack of access to therapists and transportation issues, many patients receive suboptimal recovery therapy, and their awareness of their condition is also minimal. Telerehabilitation may be able to help with these problems [18]. Determining how telerehabilitation can be better incorporated into a service delivery model allows us to focus on our procedures and determine when hands-on intervention is needed over when a hands-off coaching approach can be beneficial [19]. Rehabilitation services can range from a simple phone call with the family to a home visit when absolutely necessary, depending on the individual's needs. Since the child's and family's needs can change, the level of provision must be re-evaluated on a regular basis. During the lockdown, existing new methods for long-term quality of treatment should be applied. and its alleviation, as well as in routine-care scenarios [20].

Despite the wide range of practices, telerehabilitation can be as successful as face-to-face interventions for a variety of clinical outcomes across disciplines. Where coaching techniques are used, telerehabilitation can be more successful, particularly when achieving results related to children's actions or parental skills. Telerehabilitation appears to be a promising method of delivering recovery services to children [21]. Regardless the fact that telerehabilitation was adopted rapidly in response to a health-care crisis and is not a one-size-fits-all solution, still believe it presents significant opportunities to improve the quality, cost-effectiveness, and family-centeredness of our programs in order to better serve families with children with disabilities [22]. Telerehabilitation, in particular, can be especially helpful when combined with a coaching approach [21].

LIMITATIONS

The limitations of this study are the small sample size and the short time for collection of information's. Also, the lack of awareness of continuing the physical therapy service for children with disabilities during the pandemic. This is the first survey aimed to evaluate the impact of covid-19 pandemic on physical therapy services for children with disabilities. Further studies are needed to support the results of this study. Further studies are needed to better understand the characteristics of successful telerehabilitation therapies.

CONCLUSION

This study concluded that the majority of caregivers and their children participated in the study did not continue the physical therapy services and the reasons were high financial costs of physical therapy centers and fear of infection with COVID-19. The most predictors for discontinuing were type of disability, caregiver's working status and household size. These findings are important for pediatric physical therapists when designing plans of care for children with disabilities during COVID-19 pandemic.

ACKNOWLEDGMENTS

The authors had no acknowledgments.

Availability of data and materials

The data sets generated and analyzed during the current study are available on request due to privacy/ethical restrictions.

Declaration of interest statement

The authors declare that they have no competing interests.

Compliance with ethical standards

All procedures performed in study were in accordance with the ethical standards of the institutional and/or national research committee.

Ethical approval

This study protocol reviewed and received approval from the "Biomedical Ethics Committee at Umm Al Qura University, Makkah, Saudi Arabia with approval number (HAPO-02-K012-2020-11-493).

Funding/Support and role of the sponsor

None.

Conflict of Interest

The authors declare that they have no conflicts of interest.

Informed consent

All participants signed an informed consent form before engaging in the study.

Author contributions

All authors contribute in concept and design of the study, Acquisition of data and data analysis, critical revision of the manuscript and final approval of the version to be submitted.

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