The effects of COVID-19 restrictions on gross motor function of children with cerebral palsy

Somaia A. HamedABCDE, Ahmed S. El-Gayed2ABCD, Nevien M. WakedBCD, Radwa M. Yehia1BCD, Efrem Kentiba3ACD, Akram M. Helmy4CDE

1Department of Physical Therapy for Pediatrics and women health, Faculty of Physical Therapy, Ahram Canadian University, Egypt
2Department of Pediatrics- Faculty of medicine, October 6 University, Giza Governorate, Egypt
3Department of Sports Science, Arba Minch College of Teachers Education; Arba Minch, Ethiopia
4Department of Physical therapy, College of medical rehabilitation, Qassim University Saudi Arabia, Buraydah Saudi Arabia

Authors’ Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

DOI: https://doi.org/10.58962/HSR.2023.9.4.85-93

How to Cite
https://doi.org/10.58962/HSR.2023.9.4.85-93

Abstract
Purpose. COVID-19 is an extremely infectious, life-threatening viral illness that has constituted a global public health emergency. Rehabilitation programs of children with cerebral palsy were interrupted during the COVID-19 pandemic. The aim of the study was to assess the effects of COVID-19 restrictions on gross motor function of children with cerebral palsy.

Material and Methods. In this study, a survey of fifty eight cerebral palsied children of both genders who received physical therapy recruited from three hospitals in Cairo, Egypt (October 6 university hospital-6th of October general hospital- Zaid general hospital- Zaid special hospital- Private physical therapy centers). It was done through paediatrics Quality of life inventory (cerebral therapy module) to compare between the level of the children's quality of life before and after frequent stopping of physical therapy sessions due to covid-19 pandemic.

Results. The result of this study shows that there was a significant difference in movement and balance before and after the lockdown (p <0.001). The mean value was decreased from 54.1% to 33.3%. Also, there was a significant decrease in Pain and hurt (p<0.001) from 68.2% to 37.1% and in fatigue (p<0.001) from 58.8% to 37.8%. Regarding age there was a significant difference between different age groups regarding daily activities (p<0.001), pain (p<0.010) and fatigue (p<0.030), while after lockdown, there was a significant difference between different age groups regarding daily activities (p<0.001) and fatigue (p<0.001).

Conclusion. Children with cerebral palsy were protected from COVID-19 exposure by staying at home, but their rehabilitation activities were disrupted. Therefore, during pandemics, caregivers must develop effective homecare therapy procedures, and healthcare professionals must routinely reassess the state of the child and caregiver. Additionally, caregivers of children with CP should experience less stress and anxiety. Children with CP can get multidisciplinary support, effective communication, and contact between medical professionals and families.

Key Words: cerebral palsy; COVID-19; gross motor function; lockdown; children
Анотація

Сомая А. Хамед, Ахмед С. Эль-Гайєд, Невіен М. Вакед, Радва М. Ієхія, Ефрем Кентіба, Акрам М. Хелмі. Вплив обмежень COVID-19 на загальну моторику дітей з церебральним параліччем


Матеріал і методи. У цьому дослідженні було проведено опитування п’ятдесяти восьми дітей із церебральним паралічом обох статей, які отримували фізіотерапію, набраних із трьох лікарень у Каїрі, Египет (університетська лікарня 6 жовтня — загальна лікарня 6 жовтня — лікарня Ель Хосарі — загальна лікарня Заїда — спеціалізовані лікарні Заїда). Це було зроблено за допомогою педіатричної інвентаризації якості життя (модуль церебральної терапії), щоб порівняти рівень якості життя дітей до та після частого припинення сеансів фізіотерапії через пандемію COVID-19.

Результати. Результат цього дослідження показує, що існувала значна різниця в рухах і рівновазі до і після блокування (p <0,001). Середнє значення знизилось з 54,1% до 33,3%. Також спостерігалося значне зниження болю та бою (p<0,001) з 68,2% до 37,1% і втоми (p<0,001) з 58,8% до 37,8%. Це стосується віку, між різними віковими групами спостерігалась значна різниця щодо повсякденної діяльності (p<0,001), болю (p<0,010) і втоми (p<0,030), тоді як після карантину спостерігалася значна різниця між різними віковими групами щодо повсякденної діяльності (p<0,001) і втоми (p<0,001).

Висновок. Діти з церебральним паралічом були захищені від зараження COVID-19, залишаючись вдома, але їх реабілітаційні заходи були зірвані. Тому під час пандемії вихователі повинні розробити ефективні процедури домашньої терапії, а медичні працівники повинні регулярно переоцінювати стан дитини та опікуна. Крім того, вихователі дітей з ДЦП повинні відчувати менше стресу та тривоги. Діти з ДЦП можуть отримати мультидисциплінарну підтримку, ефективне спілкування і контакт між медичними працівниками та родиною.

Ключові слова: дитячий церебральний параліч; COVID 19; груба моторність; закриття; діти

Аннотация

Сомая А. Хамед, Ахмед С. Эль-Гайєд, Невіен М. Вакед, Радва М. Ієхія, Ефрем Кентіба, Акрам М. Хелмі. Влияние ограничений, связанных с COVID-19, на общую моторику детей с церебральным параличом

Цель. COVID-19 — чрезвычайно заразное, опасное для жизни вирусное заболевание, которое представляет собой глобальную чрезвычайную ситуацию в области общественного здравоохранения. Программы реабилитации детей с ДЦП были прерваны во время пандемии COVID-19. Цель исследования состояла в том, чтобы оценить влияние ограничений, связанных с COVID-19, на общую моторику детей с церебральным параличом.

Материал и методы. В этом исследовании было проведено обследование пятидесяти восьми детей с церебральным параличом обоего пола, получавших физиотерапию, набранных из трех больниц в Каире, Египет (университетская больница 6 октября — общая больница 6 октября — больница Эль Хосари — больница общего профиля Заида). Это было сделано с помощью детской инвентаризации качества жизни (модуль церебральной терапии) для сравнения уровня качества жизни детей до и после частого прекращения занятий лечебной физкультурой из-за пандемии covid-19.

Полученные результаты. Результат этого исследования показывает, что существовала значительная разница в движениях и балансе до и после блокировки (р <0,001). Среднее значение уменьшилось с 54,1% до 33,3%. Также наблюдалось значительное снижение боли и ушиба (р<0,001) с 68,2% до 37,1% и утомляемости (р<0,001) с 58,8% до 37,8%. Что касается возраста, между разными возрастными группами была значительная разница в отношении повседневной активности (р<0,001), боли (р<0,010) и усталости (р<0,030), в то время как после изоляции между разными возрастными группами была значительная разница в отношении повседневной активности. (р<0,001) и усталость (р<0,001).

Выводы. Дети с церебральным параличом были защищены от воздействия COVID-19, оставаясь дома, но их реабилитационная деятельность была сорвана. Поэтому во время пандемии лица, осуществляющие уход, должны разработать эффективные процедуры терапии на дому, а медицинские работники должны регулярно переоценивать состояние ребенка и лица, осуществляющего уход. Кроме того, лица, осуществляющие уход за детьми с ДЦП, должны испытывать меньше стресса и беспокойства. Дети с ДЦП могут получить междисциплинарную поддержку, эффективное общение и контакты между медицинскими работниками и семьями.

Ключевые слова: детский церебральный паралич; COVID 19; крупная моторика; карантин; дети
Introduction

At the end of 2019, a series of pneumonia cases of unknown cause emerged in Wuhan [1]. After few weeks, in January 2020, deep analysis of samples from respiratory tract found coronavirus 2 (SARS-CoV-2) as a cause for this observed pneumonia [2]. On March 11th, 2020 the World Health Organization (WHO) declared the disease caused by SARS-CoV-“COVID-19” a pandemic status, when more than 118,000 cases and over 4000 deaths were reported [3].

COVID-19 pandemic affected certain vulnerable groups including disabled, chronically ill & immune-compromised children. Although children affected by COVID-19 had mild diseases and have low rate, the recent emergence of the possibilities of associated inflammation for multi systems re-shifted the focus back to children [4]. However, there is a need to emphasize that the pandemic has adverse effects on children health beyond the viral infection. There has been little attention focused on psychosocial aspects of children during this pandemic. In particular, children with developmental disabilities are especially vulnerable during this period of change [5].

Children with developmental disabilities younger than 5 years were estimated globally about 52.9 million [6]. In the United States of America, 1 in 6 children aged between 3 to 12 years of age have a developmental disability [7]. These children and their families need much more periods of their life to reach social and peer acceptance. As the world fight to adapt to that ongoing pandemic, this group of children need to be considered due to 3 key factors: greater healthcare needs, dependency on community-based services (CBS) and neonatal health Concerns [5].

Children with developmental disabilities need much healthcare when compared with their normal peers. This includes (1) high incidence of associated medical conditions such as asthma, food and skin allergies (2) greater healthcare use and (3) greater effect of their illness on daily-life (such as in mobility and adaptive skills) [8, 9]. Cerebral palsy (CP) is one of the most common childhood disorders that caused due to lesion in the brain during development, it occurrence rate is about 2-2.5 per 1,000 live births. It begins early in life and affects all aspects of life [10]. These children may suffer from postural, coordination, sensory and mental disorders in their life. These cognitive and motor dysfunctions limit the abilities of these children to participate in society as their normal peers [11, 12]. The WHO defines quality of life (QOL) as individual’s perception of their position in life, in the context of the cultural and value systems in which they live, and in relation to their goals, expectations, standards, and concerns. QOL is a multi-dimensional construct and is an overall assessment of health status [11-13].

Rehabilitation programs of children with CP were interrupted during the COVID-19 pandemic [14]. Due to the lockdown, disabled children could not attend to their physiotherapy sessions. We expect that determining how children with CP, a population that requires special support, spent this period and the level of difficulties and anxiety experienced by caregivers is very important. The aim of this study is to support children with cerebral palsy and their families to reach a better response during any future pandemics, through detecting the nature of impact of stopping physical therapy on the quality of life in cerebral palsy children. Awareness of these risks leads to better responses that can alleviate the inconsistent on children with disabilities. It draws attention to some promising practices already being undertaken around the world and identifies key actions for stakeholders. This may help health providers to find alternatives or modify home program to reduce this gap during any future pandemic and frequent stopping of physical therapy at any time.

Materials and Methods

Participants

A survey for fifty eight cerebral palsied children of both genders who received physical therapy recruited from three hospitals in Cairo, Egypt (October 6 university hospital-6th of October general hospital- El Hosary hospital- Zaid general hospital- Zaid special hospital- Private physical therapy centers.)

To be eligible for inclusion, participants should present the following characteristics: have a diagnosis of spastic cerebral palsy (SCP) according to international guidelines for CP diagnosis [19]. The ages of children ranged from 2 years up to 18 years old and all participants were living in Al- Giza government Exclusion criteria were: 1) Cerebral palsied patients who are younger than 2 years old or older than 18 years old. 2) Surgery performed less than 90 days before enrollment. 3) Severe visual, auditory impairment or severe cardiopulmonary issues. 4) Children with a severe psychosocial, behavioral or cognitive disorder.
Ethical approval for the study was obtained from the Ethical Committee of the Faculty of Physical Therapy, Cairo University, Egypt approved the study (No: P.T. /REC /012/003110).

Outcomes measures and the criteria to measure the indicators

Assessment of QOL is important and should be made to examine the problem areas in children with CP, so as to provide supportive treatment and intervention in serious cases [15]. Health-Related Quality of Life (HRQOL) can severely affect two-thirds of the children with CP. The selected dimensions of pediatric quality of life (PedsQL), (Movement and balance, Daily activities, Pain and hurt, Fatigue) are more affected than clinical burden, economic burden, and the school dimensions. Selected quality of life dimensions related to general motor function (Movement and balance, Daily activities, Pain and hurt, Fatigue) were measured by using (PedsQL) 3.0 inventory scale [15]. Movement and balance is related to a condition characterized by difficulty in moving one or more limbs, part(s) of body and difficulty keeping his/her balance when sitting in a chair or standing. Daily activities are those related with putting on his/her own shoes, putting a shirt on over his/her head, putting pants on when getting dressed, buttoning his/her own shirt, brushing his/her own hair, getting into the bathroom to use the toilet, undressing to use the toilet, getting in and out of the bathtub/shower and brushing his/her teeth. Pain and hurt include conditions like aches in joints and/or muscles, having a lot of pain, trouble sleeping because of pain or aching in joints and/or muscles and muscles getting stiff and/or sore. Fatigue includes feeling tired, feeling physically weak (not strong), feeling to rest a lot and feeling that he/she doesn’t have enough energy to do things that he/she likes to do [16].

Review supports the reliability, validity, and sensitivity of the PedsQL in CP children. The PedsQL is the only validated HRQOL instrument to span ages 5 to 18 years for child self-report and ages 2 to 18 years for parent proxy-report while maintaining items and the scale construct consistency. Most subscales exceeded the minimum reliability standard of 0.70, and a number of scales approached or met the reliability criterion of 0.90 recommended for analyzing individual patient scores. Arabic version was used in this study [17].

Procedures

The PedsQL administration guidelines as follows: The parents/child were asked about the grade of the problem of each item the child had in the past before frequent stopping of physical therapy and after the periods of stopping. Ask the parents/child to choose the number (0-4) which represents the answer of the question. Zero (0) if there is no problem, 1 if it is almost never having a problem, 2 if it is sometimes a problem, 3 if it is often a problem and 4 if it is almost always a problem. All the parents/children were instructed to clarify if they need any help during the administration of questionnaire. At the beginning of each subscale, the therapist repeats the recall interval instructions (in the past before stopping and after this periods) to remind the parents to respond only for that specific recall interval.

Items rated on 5-point response scale to indicate how much the child has problems with various areas of functioning, ranging from 0(never) to 4(almost always). These items are linearly transformed to a 0-100 scale as follows: 0=100, 1=75, 2=50, 3=25, and 4=0. The scale scores for each dimension was computed as sum of the items over the number of items answered, with lower scores indicating poorer HRQOL and higher scores indicating better HRQOL. There is no total score for this questionnaire.

Statistical techniques

SPSS version 25.0 was used in statistical analysis. Paired sample t-test was used to compare differences between activities before and after lockdown for each age group. ANOVA test was used to assess differences in activities between all age groups for both before and after the lockdown. All the values in the test were presented as (Mean±SD) at 5% alpha value. IBM-SPSS version 25 (IBM, Armonk, NY, United States of America) was used to process the statistical analysis.

Results

Descriptive statistics

Fifty eight cerebral palsied children of both genders including 28 girls and 30 boys participated in this study, eleven child aged from 2 to 4 years, twenty five aged from 5 to 7, eleven aged from 8 to 12 and elven aged from 12 to 18 years of age (Table 1). According to the pediatrics Quality of life inventory (cerebral palsy module) when comparing between the levels of the children quality of life before and
after the pandemic, frequent stopping of physical therapy sessions after lockdown were reported due to the covid-19 pandemic.

**Table 1**

<table>
<thead>
<tr>
<th>Variables</th>
<th>n=58</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>30</td>
<td>52%</td>
</tr>
<tr>
<td>Female</td>
<td>28</td>
<td>48%</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age categories (years)</th>
<th>2 to 4 years</th>
<th>5 to 7 years</th>
<th>6 to 12 years</th>
<th>13 to 18 years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 to 4 years</td>
<td>11</td>
<td>25</td>
<td>11</td>
<td>11</td>
<td>58</td>
</tr>
<tr>
<td>5 to 7 years</td>
<td>25</td>
<td>25</td>
<td>11</td>
<td>11</td>
<td>58</td>
</tr>
<tr>
<td>6 to 12 years</td>
<td>11</td>
<td>25</td>
<td>11</td>
<td>11</td>
<td>58</td>
</tr>
<tr>
<td>13 to 18 years</td>
<td>11</td>
<td>25</td>
<td>11</td>
<td>11</td>
<td>58</td>
</tr>
</tbody>
</table>

Difference between activities before and after lockdown for all age groups is explained in table 2. In children aged 2 to 4 years, the results shows that there was a significant difference between movement and balance before and after the lockdown (p<0.022). The mean value was decreased from 66.3% to 45.9%. Also, there was a significant decrease in pain and hurt (p<0.003) from 53.9% to 32.9% and a significant decrease in fatigue (p<0.010) from 64.1% to 47.2%. And there is no significant difference in daily activities (p > 0.05). In children aged 5 to 7 years, the results shows that there was a significant difference between movement and balance before and after lockdown (p<0.002). The mean value was decreased from 49.4% to 30.6%. Also, there was a significant decrease in Pain and hurt (p<0.001) from 71.7% to 39.4% and a significant decrease in fatigue (p<0.001) from 65.6% to 43.8%. And there is no significant difference between Daily activities (p > 0.05). In children aged 8 to 12 years, there was a significant difference between movement and balance before and after lockdown (p<0.001). The mean value was decreased from 51% to 27.3%. Also, there was a significant decrease in daily activities (p<0.002) from 18.4% to 9.4%. Pain and hurt was decreased from 67.7% to 40% also fatigue from 48.1% to 30.4%. In children aged 13 to 18 years, there was a significant difference between movement and balance before and after lockdown (p <0.001). The mean value was decreased from 55.4% to 32.7%. Also there was a significant difference between Pain and hurt before and after lockdown (p <0.001). The mean value was decreased from 75.3% to 33.1%. Also, there was a significant decrease in fatigue (p<0.001) from 48.6% to 22.2%, whereas, there is no significant difference in Daily activities (p>0.05) (Table 2).

**Table 2**

<table>
<thead>
<tr>
<th>Variables</th>
<th>2-4 years age</th>
<th>5-7 years</th>
<th>8-12 years</th>
<th>13-18 years</th>
<th>p-value</th>
<th>2-4 years age</th>
<th>5-7 years</th>
<th>8-12 years</th>
<th>13-18 years</th>
<th>p-value</th>
<th>2-4 years age</th>
<th>5-7 years</th>
<th>8-12 years</th>
<th>13-18 years</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement and balance (Sc)</td>
<td>66.36±18.31</td>
<td>45.91±20.35</td>
<td>0.001</td>
<td>49.49±22.69</td>
<td>30.66±18.52</td>
<td>0.002</td>
<td>51.00±15.59</td>
<td>27.36±11.68</td>
<td>0.001</td>
<td>55.45±15.72</td>
<td>32.73±12.30</td>
<td>0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily activities (Sc)</td>
<td>56.36±28.82</td>
<td>40.91±23.86</td>
<td>0.186</td>
<td>23.34±16.24</td>
<td>22.00±16.99</td>
<td>0.776</td>
<td>18.44±5.99</td>
<td>9.41±6.22</td>
<td>0.002</td>
<td>57.73±26.68</td>
<td>45.45±27.30</td>
<td>0.299</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain and hurt (Sc)</td>
<td>53.90±17.00</td>
<td>32.99±10.68</td>
<td>0.003</td>
<td>71.71±16.48</td>
<td>39.44±20.54</td>
<td>0.001</td>
<td>67.73±11.48</td>
<td>40.00±15.65</td>
<td>0.001</td>
<td>75.36±18.91</td>
<td>33.18±15.80</td>
<td>0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatigue (Sc)</td>
<td>64.19±15.54</td>
<td>47.26±12.10</td>
<td>0.010</td>
<td>65.60±23.64</td>
<td>43.80±17.22</td>
<td>0.001</td>
<td>48.18±19.27</td>
<td>30.45±19.55</td>
<td>0.045</td>
<td>48.64±14.33</td>
<td>22.27±11.90</td>
<td>0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at p-value<0.05, Sc=PedSQ 3.0 Scale (higher scores indicate better outcome indicator)*
Table 3 shows that for the entire sample, there was a significant difference between movement and balance before and after lockdown (p < 0.001). The mean value was decreased from 54.1% to 33.3%. Also, there was a significant decrease in Pain and hurt (p<0.001) from 68.2% to 37.1% and in fatigue (p<0.001) from 58.8% to 37.8%.

Table 3 shows that before lockdown, there was a significant difference between different age groups regarding daily activities (p<0.001), pain (p<0.010) and fatigue (p<0.030), while after lockdown, there was a significant difference between different age groups regarding daily activities (p<0.001) and fatigue (p<0.001).

Table 3
Difference between activities before and after lockdown for all sample (n=58)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Before</th>
<th>After</th>
<th>t-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement and balance (Sc)</td>
<td>54.11</td>
<td>33.32</td>
<td>5.940</td>
<td>0.001*</td>
</tr>
<tr>
<td>Daily activities (Sc)</td>
<td>35.20</td>
<td>27.65</td>
<td>1.646</td>
<td>0.103</td>
</tr>
<tr>
<td>Pain and hurt (Sc)</td>
<td>68.27</td>
<td>37.14</td>
<td>9.674</td>
<td>0.001*</td>
</tr>
<tr>
<td>Fatigue (Sc)</td>
<td>58.81</td>
<td>37.84</td>
<td>5.722</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

*Significant at p-value<0.05, Sc=PedsQL 3.0 Scale (higher scores indicate better outcome indicator)

Table 4
Difference between age groups regarding activities before and after lockdown (ANOVA test)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Before</th>
<th>After</th>
<th>F-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement and balance (Sc)</td>
<td>2.018</td>
<td>2.731</td>
<td>0.122</td>
<td>0.053</td>
</tr>
<tr>
<td>Daily activities (Sc)</td>
<td>13.934</td>
<td>8.684</td>
<td>0.001*</td>
<td>0.001*</td>
</tr>
<tr>
<td>Pain and hurt (Sc)</td>
<td>3.932</td>
<td>0.647</td>
<td>0.013*</td>
<td>0.588</td>
</tr>
<tr>
<td>Fatigue (Sc)</td>
<td>3.210</td>
<td>6.683</td>
<td>0.030*</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

*significant at p-value<0.05, Sc=PedsQL 3.0 Scale (higher scores indicate better outcome indicator)

Discussion

COVID-19 pandemic affected all society members, children with disabilities are impacted due to attitudinal, environmental and institutional barriers that are reproduced in the COVID-19 response. The COVID-19 pandemic, and response to it, may affect children with cerebral palsy and their families and that may have negative effects on gross motor function and quality of life [6, 18]. Quarantine measures such as school closures and restrictions on movements disrupt children's routine and social support while also placing stress on parents or caregivers who may have to find new childcare options. Stigma and discrimination related to COVID-19 may make cerebral palsy patients more susceptible to violence and psychosocial distress.

The result of this study shows that in all age groups there was a significant decrease between (movement and balance), (Pain and hurt) and fatigue before and after the lockdown. Lack of physical therapy may lead to disturbance of movement and balance, but in pain and fatigue most of mothers reported that the child after coming back from physical therapy sessions became so tired and having pain due to the effect of exercise became less during lockdown. On the other hand, the lack of physical therapy leads to more tightness and weakness which affects movement and balance.

The results of the current study come in agreement with [7, 18], who mentioned that staying at home, their treatment routine have disrupted even their school regular attendance, which creates a unique situation for patient and their families. These changes have happened abruptly and the consequences could be particularly profound in the
It is therefore important to ask how COVID-19 is affecting the quality of life of these patients, with a view to gaining insight into how physical therapist, governments and society can support them in the future. Also [9-21], discussed that consistency and intensity of intervention is very important. This is why children often continue to receive therapy during school vacations. COVID-19 limits the provision of continued intervention services [5], for children with CP. It was noted that cerebral palsied patients require continued services in a pandemic situation. The severity and chronicity of COVID-19 will test the resilience and resourcefulness of communities, governments and countries.

**Conclusion**

Children with CP were protected from COVID-19 exposure by staying at home, but their rehabilitation activities were disrupted. Therefore, during pandemics, caregivers must develop effective homecare therapy procedures, and healthcare professionals must routinely reassess the state of the child and caregiver. Additionally, caregivers of children with CP should experience less stress and anxiety. Children with CP can get multidisciplinary support, effective communication, and contact between medical professionals and families.

**Conflict of interests**

There are no conflicts of interest that are relating to this article.

**References**


Information about the authors

Somaia A. Hamed
somaia.ali@acu.edu.eg
https://orcid.org/0000-0001-9794-7353
Department of Physical Therapy for Pediatrics and women health, Faculty of Physical Therapy, Ahram Canadian University, Egypt

Ahmed S. El-Gayed
ahmedgayed.med@o6u.edu.eg
https://orcid.org/0000-0001-7092-7950
Department of Pediatrics- Faculty of medicine, October 6 University, Giza Governorate, Egypt

Nevien M. Waked
Nevien.Waked.med@o6u.edu.eg
https://orcid.org/0000-0003-0870-8292
Department of Pediatrics- Faculty of medicine, October 6 University, Giza Governorate, Egypt

Radwa M. Yehia
Radwa.yehia@acu.edu.eg
https://orcid.org/0000-0002-7169-7058
Department of Physical Therapy for Pediatrics and women health, Faculty Of Physical Therapy, Ahram Canadian University, Egypt

Efrem Kentiba
efre89@gmail.com
http://orcid.org/0000-0001-7013-2605
Department of Sports Science, Arba Minch College of Teachers Education; Arba Minch, Ethiopia

Akram M. Helmy
am.abdella@qu.edu.sa
https://orcid.org/0000-0003-1011-6165
Department of Physical therapy, College of medical rehabilitation, Qassim university Saudi Arabia, Buraydah Saudi Arabia

Информація про авторів

Сомая А. Хамед
somaia.ali@acu.edu.eg
https://orcid.org/0000-0001-9794-7353
Кафедра лікувальної фізкультури педагогів та жіночого здоров'я факультету лікувальної фізкультури, Канадський університет Ахрама, Єгипет
Ахмед С. Ель-Гайед
ahmedgayed.med@o6u.edu.eg
https://orcid.org/0000-0001-7092-7950
Кафедра педиатрии – медицинский факультет, Университет 6 октября, Гиза Governorate, Египет

Невиен М. Вакед
Nevien.Waked.med@o6u.edu.eg
https://orcid.org/0000-0003-0870-8292
Кафедра педиатрии – медицинский факультет, Университет 6 октября, Гиза Governorate, Египет

Радва М. Єхія
Radwa.yehia@acu.edu.eg
https://orcid.org/0000-0002-7169-7058
Кафедра лікувальної фізкультури педіатрії та жіночого здоров'я факультету лікувальної фізкультури, Канадський університет Ахрама, Єгипет

Єфрем Кентиба
efre89@gmail.com
http://orcid.org/0000-0001-7013-2605
Департамент спортивных наук, Педагогічний коледж Арба Мінча; Арба Мінч, Ефіопія

Акрам М. Хелмі
am.abdella@qu.edu.sa
https://orcid.org/0000-0003-1011-6165
Кафедра лікувальної фізкультури коледжу медичної реабілітації ім. Університет Кассіма, Саудівська Аравія, Бурайда, Саудівська Аравія

Информация об авторах

Сомайя А. Хамед
somaia.ali@acu.edu.eg
https://orcid.org/0000-0001-9794-7353
Кафедра лечебной физкультуры педиатрии и женского здоровья факультета лечебной физкультуры, Канадский университет Ахрам, Египет

Ахмед С. Эль-Гайед
ahmedgayed.med@o6u.edu.eg
https://orcid.org/0000-0001-7092-7950
Кафедра педиатрии - медицинский факультет Университета 6 октября, Гиза Governorate, Египет

Невиен М. Вакед
Nevien.Waked.med@o6u.edu.eg
https://orcid.org/0000-0003-0870-8292
Кафедра педиатрии - медицинский факультет Университета 6 октября, Гиза Governorate, Египет

Радва М. Єхія
Radwa.yehia@acu.edu.eg
https://orcid.org/0000-0002-7169-7058
Кафедра лечебной физкультуры педиатрии и женского здоровья факультета лечебной физкультуры, Канадский университет Ахрам, Египет

Ефрем Кентиба
efre89@gmail.com
http://orcid.org/0000-0001-7013-2605
Департамент спортивной науки Педагогического колледжа Арбы Минч; Арба Минч, Ефипоня

Акрам М. Хелмі
am.abdella@qu.edu.sa
https://orcid.org/0000-0003-1011-6165
Кафедра лечебной физкультуры, Колледж медицинской реабилитации, Университет Кассим Саудовская Аравия, Бурайда Саудовская Аравия

This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)