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## **Telehealth during the COVID-19 pandemic regarding children with plano-valgus foot after subtalar arthroereisis**

Kamila Pardus, Krystyna Stencel-Gabriel, Zbigniew Pilecki, Marcin Hajzyk

### Affiliations:

1. Kamila Pardus

Medical University of Silesia in Katowice, Faculty of Health Sciences, Clinical Department of Paediatrics, Poland

2. Krystyna Stencel-Gabriel

Medical University of Silesia in Katowice, Faculty of Health Sciences, Clinical Department of Paediatrics, Poland

3. Zbigniew Pilecki

Department of Orthopedics and Traumatology of the Musculoskeletal System for Children in Chorzów, Poland

4. Marcin Hajzyk

Department of Orthopedics and Traumatology of the Musculoskeletal System for Children in Chorzów, Poland

Correspondence data:

Kamila Pardus  
Miła 6/11, 41-250 Czeladź,  
tel: 500060333,  
e-mail: [kamila.pardus@gmail.com](mailto:kamila.pardus@gmail.com)

Contribution statement:

Kamila Pardus:  
study concept, literature analysis, data collection and analysis, database preparation,  
preparation of the discussion, preparation of the publication

Krystyna Stencel-Gabriel:  
study concept, literature analysis, manuscript proofreading

Zbigniew Pilecki:  
study concept, manuscript proofreading

Marcin Hajzyk:  
study concept, manuscript proofreading

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Abstract

**Introduction:** The COVID-19 pandemic brought about numerous changes. Access to health services was limited, and restrictions were imposed to prevent the spread of the disease. These restrictions included wearing protective masks, staying indoors, keeping distance from others in public places, quarantines, and home isolation in confirmed SARS-CoV-2 cases. Consequently physical activity of children was limited due to their increased time at home,

which could result in reduced physical performance and abnormal development.

**Aim:** This study aimed to assess the access to physiotherapy and the use of telemedicine regarding children after subtalar arthroereisis surgery during the COVID-19 pandemic.

**Material and methods:** Seventy-nine parents/guardians of children who underwent subtalar arthroereisis surgery at Chorzow Municipal Hospital Complex between May 2019 and May 2021 participated in the study. A self-administered questionnaire designed for the study was used as the research method.

**Results:** The results showed that some respondents perceived the wait times at the National Health Service and the cost of private services as problems during the COVID-19 pandemic. However, increased problems associated with general access or course of treatment were not confirmed. Sixty-seven percent of respondents confirmed decreased physical activity in children due to the COVID-19 pandemic. One-third of parents noticed weight gain and muscle weakness in their children, while for 56% of respondents, the weight gain was not noticeable. In addition, more than 70% of the children had no complaints of pain. The results also showed that only 36.8% of respondents used telemedicine during the pandemic.

**Conclusions:** The constraints imposed by the COVID-19 pandemic caused a decline in children's physical activity; one-third of parents reported weight gain in their children. In addition, waiting times for physiotherapy reimbursed by the National Health Fund were long, and the cost of private physiotherapy was higher; it could not be confirmed whether more patients subsequently used telemedicine.

Keywords: COVID-19, pandemic, coronavirus, children, flat feet

## 1. Introduction

Coronavirus disease 2019 (COVID-19) is an acute infectious respiratory disease caused by the SARS-CoV-2 coronavirus of zoonotic origin. First identified in 2019 in Hubei Province, China, the disease spread rapidly worldwide, and the World Health Organization (WHO) declared a global COVID-19 pandemic in November 2020. As a result, many countries decided to impose a series of long-lasting restrictions on being in public places and having contact with others. These included hospitals, medical facilities, schools, shops, public transport, etc. The main restrictions in public places were to wear protective masks covering the nose and mouth and to maintain distance from others. In addition, quarantine was introduced in cases of suspected illness and domestic isolation in cases of a positive COVID-19 test. People were advised to stay home unless leaving was absolutely necessary. Access to hospitals and clinics was also more difficult. Some hospitals were converted into infectious disease hospitals where confirmed COVID patients were treated.

The pandemic also affected the work of physiotherapists. Initially, it was recommended that rehabilitation services be suspended. Rehabilitation clinics were closed, and patients could not receive treatments and physiotherapy services. In time, the rehabilitation services were allowed to resume, provided that they followed the WHO guidelines and hygiene regulations were followed. As a result, contact with the patients was reduced. Telerehabilitation was introduced by pediatric physiotherapists to provide rehabilitation services, which allowed consultations to be conducted by telephone or computer via online appointments. While this method is not a substitute for regular office visits, it is a better solution than the complete absence of physiotherapeutic consultations [1].

## 2. Objective

The main aim of this study was to evaluate the problems with access to physiotherapy regarding children after subtalar arthroereisis surgery that occurred during the COVID-19 pandemic. Specific objectives are to evaluate the availability and course of physiotherapy during the COVID-19 pandemic and to evaluate the number of patients who accessed telerehabilitation methods during the COVID-19 pandemic.

### 3. Material and methods

A retrospective study involved 79 parents/guardians of children who underwent subtalar arthroereisis at Chorzow Hospital Complex between 05/2019 and 05/2021. The study included children aged 9 to 17 years (55 boys and 24 girls, mean age 12.7). The study group was assembled based on the patients medical histories.

The exclusion criteria were concomitant neurological diseases, including cerebral palsy, genetic defect syndromes, and malignant diseases, being over 18 years of age at the time of the procedure and lack of guardian's consent for the study. The study used a self-administered questionnaire that included questions about telemedicine during the COVID-19 pandemic in children following subtalar arthroereisis. The questionnaire was sent to all respondents in February 2022.

A positive opinion was obtained from the Bioethics Committee of the Medical University of Silesia in Katowice (KNW/0022/ KB /233/19). All parents/guardians were informed by telephone about the study, its purpose and research methods, and that participation was voluntary and anonymous. Due to the limitations posed by the Covid 19 pandemic, parents/guardians who consented to the study were contacted by email.

### 4. Results

The statistical analyses were carried out using IBM SPSS Statistics 28. The results were analyzed qualitatively.

We found that almost 50% of the parents/guardians did not encounter problems in accessing physiotherapy during the COVID-19 pandemic. In addition, 10.3% of guardians mentioned elevated cost of private physiotherapy, suggesting that some respondents perceived National Health Service waiting times and the cost of private services to be a problem during the COVID-19 pandemic. However, an increase in problems with general access or course of treatment was not confirmed. The results are shown in Figure 1.

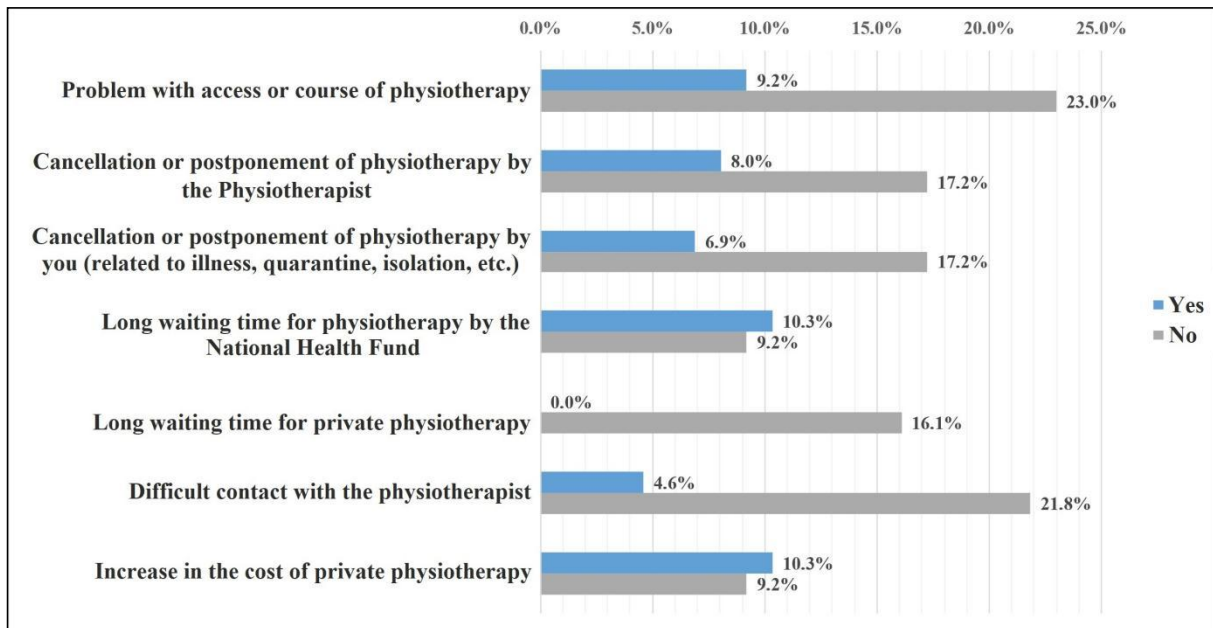


Figure 1. Access to physiotherapy during the COVID-19 pandemic

Reduced physical activity in children due to the COVID-19 pandemic was confirmed by nearly 67% of the parents/guardians surveyed. More than half of respondents (56%) reported that their children did not gain weight, while 1/3 noted their children's weight gain and muscle weakness during the COVID-19 pandemic. In addition, more than 70% reported that their children did not experience pain. Within the study sample, approximately 10% of parents gave no response. The results are shown in Figure 2.

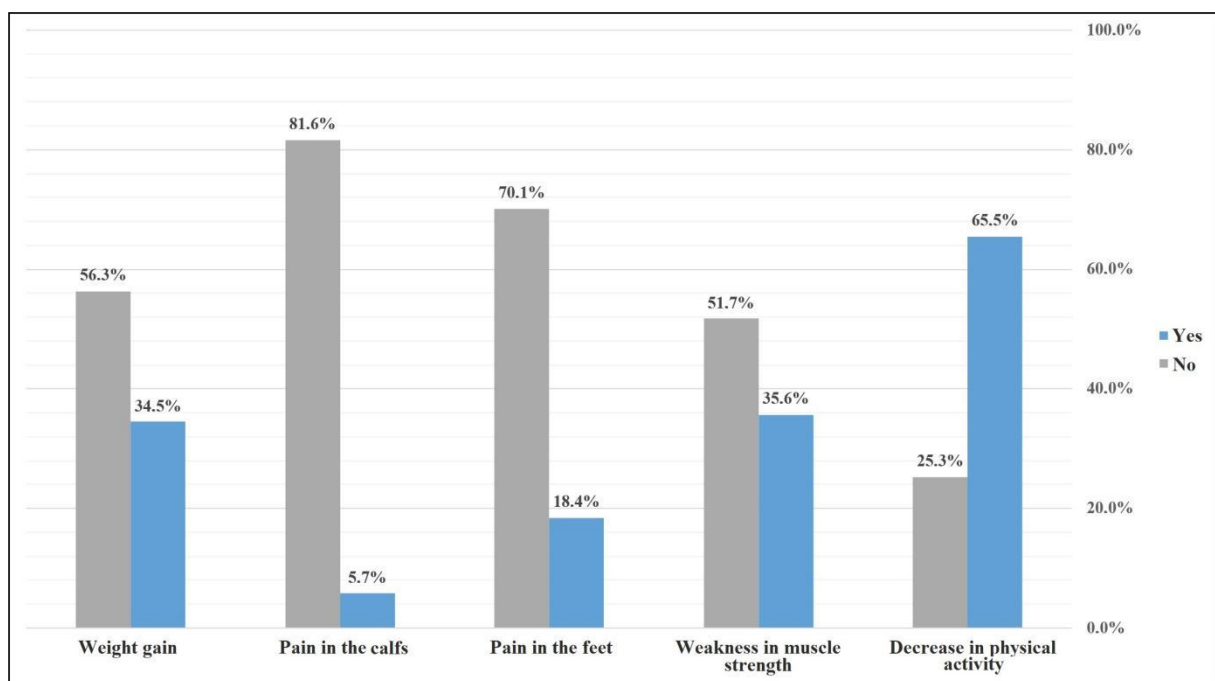


Figure 2. Musculoskeletal abnormalities in children due to the COVID-19 pandemic

The results show that up to 63.2% of patients did not use telemedicine during the COVID-19 pandemic. Only 26.4% of the respondents used telemedicine, and 1.1% used online consultation. The results are shown in Figure 3.

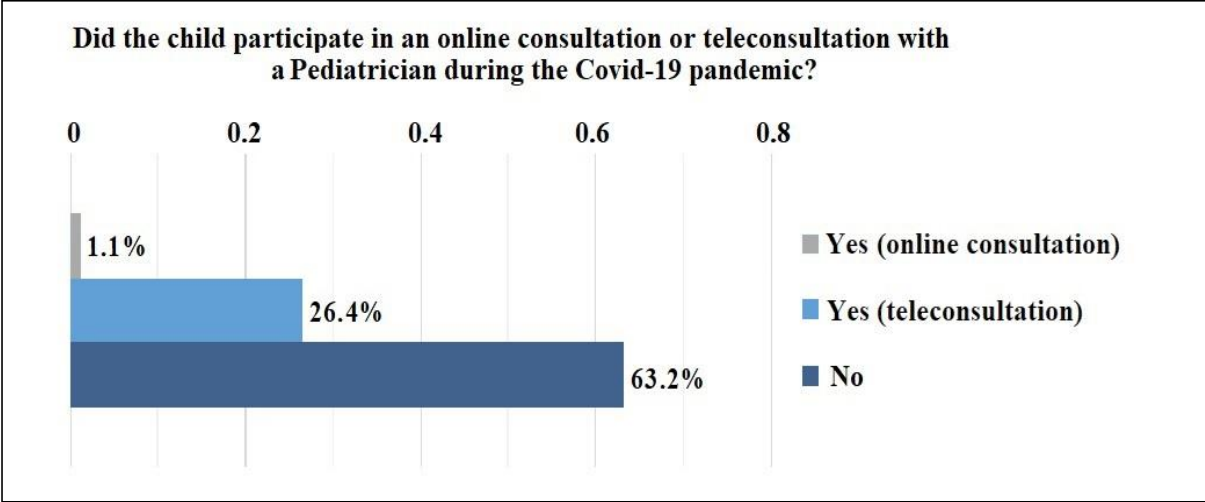


Figure 3. Number of respondents who used telemedicine during the COVID-19 pandemic

### 5. Conclusions

The restrictions associated with the COVID-19 pandemic may have impacted children's health care and physical fitness. During the pandemic, long waiting times for physiotherapy through the National Health Fund (NHF) and increased costs for private physiotherapy appeared to be problematic in the access to physiotherapy. Our results did not confirm whether a higher proportion of patients used telemedicine during the duration of study. Physiotherapy consultations require the patient to be present to properly assess their health status. What was most noticeable in the children was reduced physical activity during the COVID-19 pandemic. This was most likely related to the strict quarantine, isolation, and being told to leave the house only when necessary. More than half of the parents reported that their children had not gained weight, while one-third of the children surveyed had.

### 6. Discussion

During COVID-19, many hospitals were converted into infectious disease hospitals, with appropriately equipped staff caring for COVID-19 patients. In their paper, P. Kulinski, Ł.

Tomczyk and P. Morasiewicz assessed the impact of the pandemic on foot surgery in children and adults. The authors reported that during the pandemic, there was a 55% decrease in ward admissions and a 59% decrease in total scheduled foot surgery in children compared with 2019, while plano-valgus foot surgery in children decreased by 61% [2].

A. Reza Vosoughi and R. Borazjani wrote that during the COVID-19 pandemic, all scheduled foot surgeries were canceled at one hospital in Iran. Surgeries were performed only for emergency injuries. This was likely due to the conversion of the hospital from a large orthopedic center to an infection center where patients with confirmed COVID-19 results were treated [3]. J. Day et al. also reported that during the pandemic, operations for injury fractures, dislocations, cartilage dislocations, tendon ruptures, compartment syndromes, any abnormality associated with the possibility of the blood vessel or nerve damage, chronic or acute infections requiring surgery, and malignant or benign tumors with impending fracture were prioritized [4].

Telerehabilitation was introduced among pediatric physiotherapists to adapt to the resulting limitations. This method allowed remote contact with the patient, assessment of the condition, and monitoring of the condition at home.

In a recent study, Hall, Woods, and Luechtefeld used Likert scale questionnaires aimed at physiotherapists for assessment. They included questions about the effectiveness of telemedicine during the COVID-19 pandemic. The authors demonstrated that it was effective when there was continuous access to technology and when caregivers showed engagement [5].

In addition, Miller, Pak, Keller, and Barnes conducted a study using a 5-point Likert scale questionnaire targeting patients who used rehabilitation services during a pandemic. The authors investigated what percentage of physiotherapists offered consultations on telerehabilitation. Their study demonstrated that up to 85% of sessions were conducted via telemedicine, and that all physiotherapists used it at least once. Moreover, up to 92% of patients wished to use telerehabilitation in the future [6].

The study by Hall et al. investigated the use of telemedicine during a pandemic among pediatric physiotherapists. Surveys were sent to 205 individuals. The authors reported that 96% of respondents had never used telerehabilitation before the pandemic, while the majority found it very effective and would retain this form of service in the future [7].

The closure of schools and most public places and limited contact with peers led to reduced physical activity among children. As a result, a decrease in physical fitness and/or weight gain may have been observed. The impact of telemedicine, which primarily involves physical activity, is described in the paper by V. Calcaterra et al. The authors argue that using



this method can positively influence the assessment and control of the patient's health status in the home environment. They also claim that the use of a tele-training platform can prevent the development of obesity in children [8].

In their study, G. Kendel Jovanović et al. assessed how the pandemic affected children's dietary and lifestyle habits. The authors used a questionnaire to assess nutritional knowledge, emotional state, and lifestyle for their study. The authors demonstrated that the pandemic contributed to increased rates of overweight and obesity among children. This was associated with decreased physical activity and more time spent in front of the computer [9].

M. Vandoni et al. also confirmed that the limitations caused by the pandemic negatively impacted the development of childhood obesity in the form of increased obesity rates. The authors demonstrate that teletraining was effective in combating childhood obesity during the COVID-19 pandemic, in addition to promoting self-monitoring and behavior changes [10].

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