

### **Supplementary Material 1. Research team and reflexivity.**

A six-person research team (two women and four men) conducted the study. Four members were physical therapists, one was an occupational therapist, and one was a nurse. Three team members had clinical experience in pediatrics. All had previous experience in qualitative designs. Among the investigators, only one (A.P-A.) had a previous relationship with the included patients. The remaining authors had no previous contact with any of the participants.

Regarding the reflexivity process, prior to the study, the positioning of the researchers was established during two briefing sessions, considering their beliefs, and their motivations for this research. The researchers believed that digital physical therapy was a useful tool for following up on indications given to parents in consultation, however, difficulties related to treatment implementation appeared due to the absence of a physical therapist to guide the treatment. The motivation is based on the work with children in Early Childhood Care, together with the absence of previous research in this field in the context of the COVID-19 pandemic.

### **Supplementary Material 2. Extended information on the recruitment process.**

The following process was used: first the researchers obtained permission to access the CITO Early Intervention Center (a public service for families, although privately managed). At the center, the researchers held open meetings with the families who came to treat their children. During these meetings, the researchers informed the families and invited them to participate in the study. Of the 34 families who were interested, only 17 met the inclusion criteria and could provide relevant information to answer the research question. Of these 17 families, two withdrew due to personal circumstances, leaving 15 families (with 15 fathers and 15 mothers as potential participants) and through purposive sampling the fathers and mothers were selected until 16 were reached.

### Supplementary Material 3. Sociodemographic and clinical data of the participants.

Participant number	Sex	Age (years)	Country of origin	Attendance to sessions prior to lockdown	Work occupation during lockdown	Type of tele-intervention	Equipment used (devices and applications)
P1 (C1)	Female	36	Spain	Yes, but not much due to work	Mother: maternity leave Father: telework 8h/day	Videos, text messages and audios	Mobile phone: WhatsApp
P2 (C2)	Female	39	Spain	Yes, went in to all the sessions	Mother: unemployed. Father: telework 8h/day	Video call, videos, photos	Mobile phone: WhatsApp
P3 (C3)	Female	48	Spain	Yes, entered all sessions until the age of 3	Telework 10h/day both parents	Videos, audios, emails	Mobile phone: WhatsApp
P4 (C4)	Female	55	Spain	No, only to accompany the child	In-person work / both parents telecommuting	Videos, audios, emails	Mobile phone: WhatsApp
P5 (C5)	Female	41	Spain	Yes, once for 30 minutes	Mother: online student 4h/day. Father telework 8h	Videos, audios	Mobile phone: WhatsApp
P6 (C6)	Female	38	Romania	Yes, when the child was younger	Mother: partial work suspension Father: works 4h/day	Videos, emails, phone calls	Mobile phone: WhatsApp
P7 (C6)	Male	40	Romania	Yes, when the child was younger	Mother: half work suspension Father: works 4h/day	Videos, emails, phone calls	Mobile phone: WhatsApp
P8 (C7)	Female	34	Morocco	Yes, went in to all the sessions	Mother: housewife Father: temporary work suspension	Video call, videos, photos	Mobile phone: WhatsApp
P9 (C8)	Female	39	Spain	Yes, when the child was a baby	Mother: housewife Father: 8h in-person	Video call, videos, audios	Mobile phone, Tablet: WhatsApp

P10 (C9)	Female	41	Bolivia	Yes, went in to all the sessions	Telework 8h/day both parents	Video call, videos	Computer and Tablet: Zoom, WhatsApp
P11 (C10)	Female	40	Spain	Yes, 1-2 times/year the entire session	Mother: telework 9h/day Father: in-person 9h/day	Video call, videos, photos, audios, e-mails, etc.	Mobile phone, computer: Zoom, WhatsApp
P12 (C11)	Female	41	Belarus-Ireland	Yes, went in to all the sessions	Telework 8h/day both parents	Video call, videos, audios, e mails	Mobile phone: Zoom, WhatsApp
P13 (C12)	Female	40	Venezuela	Yes, went in to all the sessions	Telework 8h/day both parents	Video call, videos, audios, emails	Mobile phone, computer: WhatsApp
P14 (C13)	Female	43	Spain	Yes, when the child was younger	Mother: telework 8h/day Father: telework 8h/day	Videos, phone calls	Mobile phone: WhatsApp
P15 (C14)	Female	45	Argentina	No	Mother: housewife Father: deceased	Video call, videos, audios	Mobile phone: WhatsApp
P16 (C15)	Female	40	Morocco	Yes, once for 30 minutes	Both parents temporary work suspension	Video call, videos, audios, emails	Mobile phone: WhatsApp

**Supplementary Material 4. Sociodemographic and clinical data of the participants' children.**

<b>Participant number</b>	<b>Sex</b>	<b>Age (years and months)</b>	<b>Diagnosis and associated pathologies</b>	<b>Date of beginning treatment in CITO</b>	<b>Weekly minutes of physical therapy pre-lockdown</b>	<b>Weekly minutes of physical therapy during lockdown</b>	<b>Total physical therapy sessions during lockdown</b>	<b>Number of siblings</b>	<b>Ages of siblings (months/years)</b>
E1	Male	2yrs 6m	Hypoacusis and motor delay due to cytomegalovirus	09/2018	75	<b>60 (45+15)</b>	11	1	1m
E2	Male	2yrs 8m	Spastic diplegia	12/2017	90	<b>90 (45+15+15+15)</b>	15	0	-
E3	Female	2yrs 4m	Left spastic hemiparesis	09/2018	90	<b>60 (45+15)</b>	15	4	21yrs, 19yrs, 13yrs, 11yrs,
E4	Male	4yrs 7m	Probably pathogenic 16p11.2 deletion syndrome	09/2019	45	<b>30 (15+15)</b>	11	6	27yrs, 25yrs, 20yrs, 18yrs, 8yrs, 7yrs
E5	Male	4yrs 3m	Smith-Magenis syndrome	11/2017	30	<b>30 (15+15)</b>	10	1	10yrs
E6	Female	4yrs	Brachial palsy	09/2018	30	<b>30 (15+15)</b>	6	1	7yrs
E7	Male	2yrs	Wolf-Hirschorn syndrome	09/2018	90	<b>90 (45+15+15+15)</b>	17	2	10yrs, 8yrs
E8	Male	4yrs 3m	Prematurity	09/2016	30	<b>45 (30+15)</b>	11	4	13yrs, 10yrs, 4yrs
E9	Female	2yrs 3m	Down Syndrome	04/2019	45	<b>60 (45+15)</b>	12	1	19yrs
E10	Female	5yrs 2m	Spastic diplegia	01/2016	90	<b>75 (45+15+15)</b>	15	0	-
E11	Male	2yrs 2m	Spastic hemiparesis. Epilepsy	09/2019	90	<b>75 (45+15+15)</b>	15	0	-
E12	Female	2yrs	Down Syndrome	04/2018	60	<b>75 (30+30+15)</b>	15	2	8yrs, 6yrs

E13	Male	4yrs 6m	Down Syndrome. Congenital heart disease	02/2019	90	<b>45 (30+15)</b>	12	3	13yrs, 12yrs, 8yrs
E14	Male	5yrs 3m	Down Syndrome	09/2018	90	<b>45 (30+15)</b>	11	2	9yrs, 8yrs
E15	Female	3yrs 8m	Huntington's chorea	07/2019	90	<b>75 (45+15+15)</b>	14	2	6yrs, 1yrs

45 min= zoom/ phone call: same duration as their pre-lockdown session; 30 min= zoom/phone call: same duration as their pre-lockdown session; 15 min= audios/WhatsApp/sending deferred video-guidelines: families who chose to modify their 2nd session by this method, or as extra support for families who demanded it.

## Supplementary Material 5. Summary table with themes, subthemes and categories.

CATEGORY	SUBTHEME	THEME
<i>This is a guide</i>	Offers a good solution in times of COVID-19	Ambivalent experiences about digital physical therapy
<i>Serves as support and assistance</i>		
<i>Very useful option in pandemics</i>		
<i>Continuity of treatment during lockdown</i>		
<i>Complicated therapy</i>	It is difficult and insufficient as therapy on its own	
<i>Insecurity when conducting the sessions</i>		
<i>Overwhelm and stress due to lockdown</i>		
<i>Insufficient therapy</i>		
<i>Not feeling alone</i>		
<i>Smoother communication with the physical therapist</i>		
<i>Resolution of doubts</i>	Provides security and peace of mind due to the constant accompaniment of the professional.	
<i>Greater knowledge of their child and of physical therapy</i>		
<i>Feeling happy and fulfilled as a parent for doing the session</i>		
<i>They had never considered online therapy</i>	Total lack of knowledge of digital physical therapy	Barriers encountered in its implementation

<i>Unnecessary pre-pandemic mode</i>	
<i>They had never been given the possibility of tele- health</i>	
<i>Physical contact is fundamental in therapy</i>	Lack of physical contact
<i>Lack of knowledge and resources</i>	Lack of training and competencies needed to perform the complete therapy
<i>"I'm not a physio, I'm just a mother"</i>	
<i>The child noticed the change</i>	Existence of factors that disrupt the child's attention
<i>More distractors at home</i>	
<i>Less collaboration with parents</i>	
<i>Behavior modification due to the camera</i>	
<i>Children with short attention spans</i>	
<i>Work had to continue, and household tasks had to be carried out</i>	Lack of time
<i>Therapy as an extra workload for parents</i>	
<i>Faster progress in person</i>	Less psychomotor progress compared to face-to-face therapy
<i>Standstill or regression in the child</i>	
<i>Technology required at home</i>	Access to the necessary means
<i>Watching the session helps guide oneself</i>	Prior learning in face-to-face sessions
<i>Rapid response of the physical therapist to change</i>	Excellent adaptation of the physical therapist to the change of therapy

Perceived facilitators during use



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*Adaptation of the physical therapy to the home material*

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*Unestablished routines*

<i>Availability of the physical therapist</i>	Constant accompaniment of the physical therapist as a calming support
<i>Detailed explanations by the physical therapist</i>	

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*Spending more time with the family and becoming more*

<i>involved</i>	Support and involvement of all family members in therapy
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*Other family members helped*

<i>An opportunity if you cannot attend in person</i>	Therapeutic usefulness if you are unable to attend in person
<i>It can be used for specific moments</i>	

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*Preference for face-to-face therapy*

<i>Online sessions as an adjunct to face-to-face sessions</i>	A complement to face-to-face sessions, facilitating communication with families.
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Future possibilities

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*A complement for learning and resolving doubts*

<i>If the child were older, it would be more simple</i>	For older children and adults
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## Supplementary Material 6. Illustrative quotes

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### Ambivalent experiences about digital physical therapy

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Offers a good solution in times of COVID-19

P2: *"It's a guide. There are things that I don't know if he does because it's his age and all children do it, or if he has an attention deficit. I don't know if all children his age sit like this or if it's just him."*

P4: *"It helps to have a follow-up of the child, so that he isn't left without any type of follow-up."*

P12: *"It is a good solution during a pandemic. A guide to know if you are doing the exercises well and to ask questions if you have doubts."*

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It is difficult and insufficient as therapy on its own

P1: *"For me, digital practice has not been something negative as such, however I don't feel it is a truly complete therapy."*

P3: *"Add stress to the children on top of tele-studying, teleworking... So obviously J.'s rehabilitation was delegated to now we have some time, we are going to try it and we are going to respond to the physio. Which seemed insufficient to us."*

P9: *"At the beginning I was overwhelmed, maybe feeling that I wouldn't be able to do what she was explaining to me as well as she did."*

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Provides security and peace of mind due to the constant accompaniment of the professional.

P10: *"We feel fulfilled because we aren't doing it badly, we are doing well. We feel proud of our little girl."*

P12: *"It is the assurance that you can always connect with the person who can advise you and support you with the information you need."*

P16: *"He has always been there, even though he is far away he has always been within reach with us, he always talked to us."*

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### Barriers for implementation

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Total lack of knowledge of digital physical therapy

P5: *"No, I didn't know it existed. I thought that these things had been created for this type of situation. But no, we had never really tried it."*

P11: *"I hadn't thought about it because I had never had the opportunity to do things this way... at a distance."*

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Lack of physical contact

P2: *"The only negative thing, the lack of physical contact between the physiotherapist and D., because we think that therapy needs contact and movement and... touching, right?"*

P5: *"For me, physical contact is essential, especially in therapy. To me, it seems to me that a bond with the therapist has to be generated through physical contact."*

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Lack of training and competencies needed to perform the therapy

P2: *"I'm left with a little fear that she will do something I don't understand, not knowing how to reposition her, because I don't feel ready for it. So I try to get the therapist to watch as much as she can with the videos."*

P14: *"It is difficult to do physical therapy with your child when you are not a physical therapist. I do it through games, but I'm not going to do it the same way."*

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Existence of factors that disrupt the child's attention

P2: *"It was complicated, because it also depends a little on the child's attention. It is not the same coming to the center, and there is a therapist, than the distractions at home. There are days when the child may not cooperate. Because I am his mother, I have the added difficulty of being his mother."*

P11: *"My daughter was used to working in a certain way and often she would say <<no, that's not how I do it with [physical therapist's name]>>. Initially, she was very reluctant to work with us at home."*

P15: *"Often, when he realized it, he didn't do things because he knew he was being recorded."*

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Lack of time

P1: *"I am very relieved by the work of the physical therapists and the fact that [son's name] goes there with them to therapy. So, what we were taking away was actually a greater workload for me."*

P3: *"You can imagine with six people at home, how complicated it was to take care of a three-and-a-bit-year-old girl who then had to do tele-rehabilitation. It was absolutely mission impossible."*

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Less psychomotor progress compared to face-to-face therapy

P3: *"I believe that when my daughter goes in person, she progresses much faster than with me."*

P6: *"When in March it was total closure, her arm was very stiff, you could see that she wasn't doing anything. And then I thought, I don't know if it's just because I'm paying more attention now or because we're not working so much at the center, we're taking a little step backwards."*

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### **Perceived facilitators during use**

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Access to the necessary means

P10: *"We have a mobile phone and internet, so we have not had any problems to carry out the sessions"*

P14: *"We have devices and wifi. We can't complain. We have enough technology to be able to do it."*

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Prior learning in face-to-face sessions

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P2: *"Since I attended all the sessions, it has also been a bit of a learning experience, because later on it has helped me to do the exercises with my son. They have taught me to observe what a sign of alarm can be."*

P7: *"When we went to CITO, I saw the exercises she did. It has been a learning experience, because then it has helped me to do the exercises with my son and to know a little bit. They have taught me to observe what could be a warning sign."*

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Excellent adaptation of the physical therapist to the change of therapy

P5: *"She also thought about what we had at home. If perhaps you didn't have something, she would give it some thought and tell you <<so use this, a bigger ball, a smaller ball>>."*

P13: *"The adaptation was good. I shared videos with her, she gave me feedback on how she saw the child, what I had to correct and work on. It was a little bit on the fly, what was needed."*

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Constant accompaniment of the physical therapist as a calming support

P8: *"He has helped me a lot. He has explained a lot of things that were difficult for me. He explained it to me with videos where the image facilitated his technical words."*

P11: *"It's the willingness she always has to help us with the work at home. I feel that she accompanies us during the whole week."*

P13: *"We synchronized very well. We didn't just see each other on that call. I shared videos with her, she already gave me feedback on how she saw my daughter, what she needed to correct."*

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Support and involvement of all family members in therapy

P13: *"Often, they also helped me with therapy and with the activities I had to do with her."*

P16: *"As you spend more time with the family it was more pleasant. We bonded more, to help her. And the older [brother] helped her a lot."*

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## **Future possibilities**

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Therapeutic usefulness if you are unable to attend in person

P3: *"Digital physical therapy sessions are an opportunity for people who cannot attend sessions for whatever reason. This may be the pandemic, lockdown, living in a remote location, or being unable to travel for whatever reason."*

P5: *"It has helped us to continue with the rehabilitation. For children who maybe now in these circumstances can't leave the house much and have to continue with their sessions, I think it's a good option. We didn't have it before and now a window has opened."*

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A complement to face-to-face sessions, facilitating communication with families.

P11: *"Face-to-face sessions are fundamental, but it's true that having the option to make a video call or communicate interactively is useful as a complement."*

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P13: *"Technology right now is a great tool to be connected on a daily basis. There should always be an open channel where you can leave information (...) it can serve as a hybrid tool, right? Face-to-face session and the video sessions for that follow-up and continuity or doubts."*

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For older children and adults

P3: *"If J. were fourteen years old, and you have to maintain muscle tone, elasticity with exercises and so on, well, great, because you have your tele-class or your video reminder of your exercises, which you already know how to do and you can recall them."*

P11: *"If she were a little older it would be simpler. I think, maybe I'm wrong. But the truth is that she still has a hard time with it."*

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