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Original Article

Provision of occupational therapy care during the COVID-19 via telehealth to children from families living in conditions of vulnerability and confinement

Prestação de cuidados em terapia ocupacional durante a COVID-19 via telessaúde para crianças de famílias que vivem em condições de vulnerabilidade e confinamento

Prestación de atención de terapia ocupacional durante el COVID-19 a través de telesalud a niños de familias que viven en condiciones de vulnerabilidad y confinamiento

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Abstract

Introduction: The COVID-19 pandemic had a significant impact on health and education, parents and children living in non-urban areas were severely affected. **Objective:** To design and implement a telehealth based occupational therapy intervention aimed at improving the well-being of children under nine years of age living in vulnerability and confinement conditions, the latter due to the restrictions imposed due to the pandemic, through the provision of context-based occupational counseling to their parent/caregivers. **Methods:** Before-and-after study conducted in families from rural and peri-urban areas living in conditions of vulnerability and in which children were attending online school. Descriptive and a bivariate analysis of the baseline conditions of the sample were performed, as well as before-after comparisons of the objectives achieved and their differences. **Results:** 13 families completed the assessment and intervention processes (12 sessions, 94% attendance); the average age of children was 7.3 years, and in 92.3% of the families the head of the household was a woman. The before-after goals evaluation showed there were gains in all proposed goals, with the highest gains observed in the family

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social participation category. **Conclusions:** Occupational therapy, telehealth and a context-based approach provide a broad array of benefits to families and children living in vulnerability and confinement conditions.

Keywords: Occupational Therapy, Family, Telemedicine, Rural Health Services, Remote Consultation, COVID-19.

Resumo

Introdução: A pandemia da COVID-19 teve um impacto significativo na saúde e na educação; pais e filhos que vivem em áreas não urbanas foram gravemente afetados. **Objetivo:** Projetar e implementar uma intervenção de terapia ocupacional baseada em telessaúde com o objetivo de melhorar o bem-estar de crianças com menos de nove anos de idade que vivem em condições de vulnerabilidade e confinamento na Colômbia, este último devido às restrições impostas pela pandemia, por meio do fornecimento de aconselhamento ocupacional baseado no contexto para seus pais/cuidadores. **Método:** Estudo antes e depois realizado em famílias de áreas rurais e periurbanas que viviam em condições de vulnerabilidade e nas quais as crianças frequentavam a escola *on-line.* Foram realizadas análises descritivas e bivariadas das condições de linha de base da amostra, bem como comparações antes e depois dos objetivos alcançados e suas diferenças. **Resultados:** 13 famílias concluíram os processos de avaliação e intervenção (12 sessões, 94% de comparecimento); a idade média das crianças era de 7,3 anos, e em 92,3% das famílias o chefe da família era uma mulher. A avaliação das metas antes e depois mostrou que houve ganhos em todas as metas propostas, com os maiores ganhos observados na categoria de participação social da família. **Conclusão:** A terapia ocupacional via telessaúde e uma abordagem baseada no contexto proporcionam uma ampla gama de benefícios às famílias e às crianças que vivem em condições de vulnerabilidade e confinamento.

Palavras-chave: Terapia Ocupacional, Família, Telemedicina, Serviços de Saúde Rural, Consulta Remota, COVID-19.

Resumen

Introducción: La pandemia de COVID-19 tuvo un impacto significativo en la salud y la educación, los padres y los niños que viven en zonas no urbanas se vieron gravemente afectados. **Objetivo:** Diseñar e implementar una intervención de terapia ocupacional basada en telesalud dirigida a mejorar el bienestar de niños menores de nueve años que viven en condiciones de vulnerabilidad y confinamiento, esto último debido a las restricciones impuestas a causa de la pandemia, a través de la provisión de consejería ocupacional basada en el contexto a sus padres/cuidadores. **Métodos:** Estudio antes y después realizado en familias de zonas rurales y periurbanas que vivían en condiciones de vulnerabilidad y en las que los niños asistían a la escuela en línea. Se realizaron análisis descriptivos y bivariados de las condiciones basales de la muestra, así como comparaciones antes-después de los objetivos alcanzados y sus diferencias. **Resultados:** 13 familias completaron los procesos de evaluación e intervención (12 sesiones, 94% de asistencia); la edad media de los niños fue de 7,3 años, y en el 92,3% de las familias el cabeza de familia era una mujer. La evaluación de los objetivos antes-después mostró que hubo ganancias en todos los objetivos propuestos, observándose las mayores ganancias en la categoría de participación social de la familia. **Conclusiones:** La terapia ocupacional, la telesalud y un enfoque basado en el

contexto proporcionan una amplia gama de beneficios a las familias y los niños que viven en condiciones de vulnerabilidad y confinamiento.

Palabras-clave: Terapia Ocupacional, Familia, Telemedicina, Servicios de Salud Rural, Consulta Remota, COVID-19.

Introduction

Worldwide, COVID-19 caused a crisis in both health and education systems. Around the world, the response by health systems to the COVID-19 pandemic focused on preventing the transmission of the SARS-CoV-2 and the symptomatic treatment of the disease. In the case of educational institutions, they were forced to stop face-to-face teaching activities to slow down the spread of the virus and had to adapt to the use of Information and Communication Technologies (ICTs) (Kaye et al., 2021; Nicola et al., 2020; Onyema et al., 2020; Pokhrel & Chhetri, 2021).

Undoubtedly, the measures implemented due to the pandemic implied lots of changes in terms of daily life, working conditions, quality of life and well-being. In Latin America, these changes led to increased vulnerability and social gaps, especially in women and people with low income; furthermore, this situation has resulted in an increased frequency of problems in terms of physical health, mental health, nutrition and education, particularly in children and adolescents (Comisión Económica para América Latina y el Caribe, 2020). In fact, it has been estimated that in Latin America at least 67.7% of students were affected by school closures due to the pandemic, which interrupted their development processes and generated the need to create a new culture for the promotion of health and well-being in the context of confinement (Comisión Económica para América Latina y el Caribe, 2020).

In Colombia, the situation is like that of Latin America, as the pandemic and the measures implemented by the State to slow down the spread of the virus also resulted in higher inequalities and inequities in terms of access to health care services, especially in vulnerable populations, people living in rural communities and those with disabilities, among others. In this South American country, 32% of its approximately 50 million inhabitants live in rural areas, where there are large educational and social development gaps compared to people living in urban areas; besides, it has been estimated that 80% of people classified as poor in the country live in rural areas (de La O Campos et al., 2018; Departamento Nacional de Planeación, 2015; Programa de las Naciones Unidas para el Desarrollo, 2011).

In terms of vulnerability, the COVID-19 pandemic has increased the number of people living in poverty in Colombia in at least three million more and has evidenced the need for structural reforms to improve the quality of life of children and the elderly as populations at risk (Lora et al., 2021). Other social and economic impacts of the pandemic include the increase in the number of female heads of household and in the number of women holding a leadership role in rural communities; the invisibility of indigenous and afro-descendant communities, the invisibility of people due to their sexual orientation, and a worsening of the historical gaps the country has faced regarding the solution of needs in early childhood, childhood and adolescence (Comisión

Económica para América Latina y el Caribe, 2021; Departamento Nacional de Planeación, 2015; ONU Mujeres, 2020).

In light of the above situations and the changes experienced during the pandemic, reflections, discussions and actions to improve the living conditions of affected populations such as children and their parents/caregivers, whose main focus was to maintain and optimize their participation and, above all, their roles and jobs in the midst of the confinement measures implemented, arose (Moreno-Chaparro et al., 2022; Moura et al., 2021). It is at this point that the importance of Occupational Therapy is evident, since historically it has not only responded to these requirements but has emerged and strengthened in the aftermath of critical historical events, such as World Wars or the polio epidemic in Latin America (Monzeli et al., 2019).

Amidst the adversity resulting from the COVID-19 pandemic, an Occupational Therapy services provision approach based on telehealth provides a framework where the use of ICTs allows the provision of services aimed at promoting and improving health and well-being (World Federation of Occupational Therapy, 2014). Based on the above, the objective of this study was to design and implement a telehealth based occupational therapy intervention in the context of the confinement measures implemented in Colombia due to the COVID-19 pandemic aimed at improving the well-being of children under nine years of age through the provision of context-based occupational counseling to parents/caregivers living in vulnerable conditions.

Methods

Design

Quasi-experimental before-and-after study. Also called Pre and Post-Test, it is a study in which a single experimental group undergoes a measurement or observation before and after an intervention, with the characteristic that the subjects are their own controls (or intrasubject). Its strengths are the measurement of change in the same subject measured and based on time, but its weaknesses are its non-random selection and the impossibility of establishing associations (Creswell & Creswell, 2017).

Participants

Families were recruited through convenience sampling. The study population consisted of families living in rural areas, such as the Mariangola rural area of the municipality of Valledupar (department of Cesar) and peri-urban areas of Bogotá, Colombia (Capital district). The following eligibility criteria were considered: families made up of parents/caregivers and children up to nine years of age with a score < 20 points in the System for the Identification of Potential Beneficiaries of Social Protection Programs (SISBEN for its acronym in Spanish), a Colombian system developed by the National Administrative Department of Statistics (DANE for its acronym in Spanish) to measure the socioeconomic vulnerability of people (Bottia et al., 2012).

Additional inclusion criteria

- Families with children who were enrolled in a school and were attending classes only through distance learning during the pandemic.

- Families in which a report or request for occupational therapy assistance had been made by parents, teachers and/or educational institutions.

- Being available to participate in the program and having a stable internet connection.

Procedure

Vulnerable families previously identified through the efforts of an educational institution around influence of the Universidad Nacional de Colombia and of a school of the public educational system of Bogotá prioritized by socioeconomic vulnerability were invited to participate in the study. A preliminary interview was conducted with the members of those families who accepted the invitation to ensure that they met the inclusion criteria.

Subsequently, the parents or the head of household of the families were provided with links to access the telehealth-based assessment and intervention sessions through the virtual communications platform Zoom (use license purchased by the Universidad Nacional de Colombia). A professional occupational therapist and a student were assigned to accompany the families during and after the sessions to solve any doubt. The general design of the intervention program is presented in Table 1. Families could use computers, tablets, or smartphones to access the intervention sessions. Furthermore, a member of the research team was appointed to provide telephone support to families that needed assistance with the use of the platform.

Table 1. Detailed design of the assessment, intervention, and reassessment program.

Intervention program design		
Session	**Approach**	**Topics addressed**
Initial Session (2 hours)	Assessment	- Informed Consent - Sociodemographic assessment and Occupational History - Sensory Profile 2Ed (SP2) - Sensory Processing Measure (SPM) - Developmental Profile 4 (DP4) - Assessment of the ergonomic conditions at the school - Goal setting. The Goal Attainment Scale (GAS)
Sessions 1 to 4 (2 hours/session)	Intervention	- Socialization of results - Assessment of ergonomic conditions at the school (continued) - Sensory processing - Play in childhood. o Digital reminder via WhatsApp
Sessions 5-8 (2 hours/session)	Intervention	- Ergonomics for learning purposes o Reminder via SMS
Sessions 9-12 (2 hours/session)	Intervention	- Occupational performance at school - Digital reminder via WhatsApp and SMS
Final Session (2 hours)	Re-assessment	- Goal follow-up. The Goal Attainment Scale (GAS) - Socialization of results - Reflection focus group

Intervention

An intervention plan based on occupation-based training, which focuses on promoting positive interactions between children and their parents/caregivers, thus creating learning opportunities through routines and everyday life, was established. Within this model, caregivers are encouraged to use their own resources and strengths to promote the functionality of their children (Graham et al., 2013). During the sessions, caregivers identified goals and, through questions and reflective comments made by the occupational therapists, their level of knowledge about the characteristics of their children that can positively impact the intervention process increased. In addition, caregivers were able to identify the activities that are relevant to their children in their everyday life, which provides children with the amount of practice required to develop their role (Little et al., 2018).

Measurements

Measurements data were collected prior to the beginning of the intervention sessions except for the Evaluation of ergonomic conditions of the schoolchild variable, which were obtained during the sessions. Once the training activities were completed, a re-evaluation session was conducted to assess the achievement of the intervention goals as a subsequent measurement.

- *Sociodemographic assessment and occupational history:* The sociodemographic data and occupational history form is an instrument developed by the Department of Human Occupation of the Faculty of Medicine of the Universidad Nacional de Colombia. This form is made up of items designed to collect basic information about the children and their families, the schooling level of their parents, the annual income of the household, and the number of family members living in the household. As for the child's occupational profile, the following aspects were asked during the sessions: history of disease, family health history, child development characteristics, the use of routines within the family environment, and the presence of gross motor skills and personal care skills.

- *Sensory Profile-Second Edition (SP-2)* (Dunn, 2014) is a self-reported instrument consisting of 86 items used to characterize the sensory processing patterns of children at home, school and other community settings. This instrument is used to understand how sensory processing profiles affect the performance of children in everyday activities (Dean et al., 2016).

- *Sensory Processing Measure (SPM)* (Parham & Ecker, 2007) is a self-reported instrument to be completed by parents that provides a comprehensive outline of the sensory processing and integration difficulties of their children. This instrument has been shown to have good validity and reliability (Parham & Ecker, 2007) SPM is made up of eight areas, each with its own score: social participation, vision, hearing, touch, body awareness, balance and motion, planning, and ideation (Miller-Kuhaneck et al., 2007).

- *Developmental Profile 4 (DP-4)* (Alpern, 2020) is an instrument that, through an interview and a checklist to be completed by parents, allows the identification of

difficulties and strengths in five areas of child development: physical, behavioral adaptation, socioemotional, cognitive and communicative development.

- *Evaluation of ergonomic conditions of the schoolchild:* this assessment was made using an instrument developed by the research team based on standards and previous studies in ergonomics (Fernández, 2015; Lueder & Rice, 2007). Its objective is to identify the main ergonomic factors at home that may influence the performance and well-being of the child based on the individual, their environment and level of knowledge.
- *Goal Attainment Scaling (GAS)* (Steenbeek et al., 2007) is a strategy for documenting, quantifying and tracking the achievement of goals in daily life. With this method, caregivers, with the help of an occupational therapist, identify the current behavior of the child and, as sessions are completed, write detailed descriptions of the child's progress. There is evidence that the GAS strategy has strong psychometric properties for measuring goal attainment in pediatric studies (Shankar et al., 2020).

Data analysis

Quantitative and categorical variables data are described using measures of central tendency and measures of dispersion and absolute frequencies and proportions, respectively. Bivariate analyses were performed using the unpaired two-samples Wilcoxon test and the Chi-square test depending on the type of variable. A significance value of $p < 0.05$ was considered. GAS scores were calculated using means, the calculation-reporting guide for these outcomes according to Turnier-Stokes (Turner-Stokes, 2009), was used, and the difference was calculated from the subtraction of baseline and achieved scores in terms of gain ($x_{1\beta} - x_{2A}$). All statistical analyses were performed in the R software version 3.6 (R Core Team, 2021).

Ethical considerations

This study was approved by the Ethics Committee of the Faculty of Medicine of the Universidad Nacional de Colombia according to Minutes No. 014-144, issued on September 11, 2020. Likewise, it followed the ethical principles for conducting biomedical research involving human beings established by the Declaration of Helsinki (World Medical Association, 2013) and the Council of International Organizations of Medical Sciences (Council for International Organizations of Medical Sciences, 2016), as well as the health research guidelines set forth by Resolution 8430 of 1993, issued by Colombian Ministry of Health (Colombia, 1993). All the families gave their informed consent to participate in the study and agreed to share their results for academic purposes only.

Results

A total of 20 families (10 in each rural/peri-urban area) were invited to participate, of which 13 (65%) accepted the invitation. The reasons reported by the non-participating families were related to internet access difficulties and the presence of socioeconomic problems due to the pandemic.

All 13 families completed the assessment and intervention stages. The main characteristics of the sample are shown in Table 2. Overall, the sample was composed of females (n=9; 69.2%), the average age was 88 months (7.3 years), and 38.5% (n=5)

were in second grade. Besides, 69.2% (n=9) families lived in a peri-urban area, in 92.3% a woman was the head of the household, 30.8% and 46.2% were classified as very low and low socioeconomic level families, and referral by the school was reported in 53.8% (n=7). Regarding the ergonomic evaluation, it was found that 30.8% (n=4) of the families used the dining table as a study space, difficulties with the furniture such as the chair used to sit during the development of school activities and posture-related difficulties such as slumping at the study table were present in in 61.5% (n=8) and 53.8% (n=7) of the children.

Table 2. General characteristics of the sample.

	Total (N=13)
Children	
Female	9 (69.2%)
Age (in months)	
Mean (SD)	88.1 (9)
Median [Min, Max]	92 [71;101]
Caregiver	
Mother	12 (92.3%)
Age of the mother (in years)	
Mean (SD)	34 (5.96)
Median [Min, Max]	34 [26;47]
Mothers' schooling level	
Complete high school	6 (46.2%)
Incomplete primary school	1 (7.7%)
Complete technical training	4 (30.8%)
Incomplete technical training	1 (7.7%)
Incomplete University	1 (7.7%)
Grade in which the child was enrolled (Primary school)	
First grade	4 (30.8%)
Second grade	5 (38.5%)
Third grade	4 (30.8%)
Residence location	
Peri-urban	9 (69.2%)
Rural	4 (30.8%)
Socioeconomic level	
1	4 (30.8%)
2	6 (46.2%)
3	3 (23.1%)
Vulnerable population	
Victims of forced displacement due to the internal conflict	3 (23.1%)
None	10 (76.9%)
Income	
<3.000 USD (annual)	8 (61.5%)
<6.000 USD (annual)	5 (38.5%)
Reason for consultation	
Clinical referral	1 (7.7%)
Referral by the school	7 (53.8%)
Voluntary	5 (38.5%)

Table 2. Continued...

	Total (N=13)
Ergonomic factors	
Study space	
Dining table	4 (30.8%)
Room	3 (23.1%)
Living room	3 (23.1%)
Patio	2 (15.4%)
Study room	1 (7.7%)
Study time (per week)	
Mean (SD) (Minutes)	226.2 (95.4)
Median [Min, Max]	226.2 [60;420]
Furniture-related problems	
YES	8 (61.5%)
Posture-related problems	
YES	7 (53.8%)

As for standardized tests such as SP-2, SPM and DP-4, several interesting results were evidenced (see Table 3): in the case of SP-2, it was found that, regarding their area of residence, i) children living in peri-urban areas are more interested in sensory experiences, ii) children living in rural areas report they don't enjoy sensory experiences so much, and that both groups detect comparable sensory inputs and similarly ignore such inputs. Finally, in the sensory and behavioral section, both groups have a higher level of reaction to sensory information compared to other members of their families and show behaviors that are more associated with sensory processing compared to other member of their families.

With respect to the SPM, it was found that: i) results in the social participation, planning and ideas and balance-motion areas were typical in both groups; some problems in the vision and listening areas were present in the rural ($p=0.03$), and iii) some problems in the touch and body awareness area were identified in both groups.

Finally, regarding the DP-4 it was observed that both groups were in the average category in the physical, socioemotional, cognitive and communication areas; the adaptive behavior of the peri-urban group was in the average category and 50% of the children in the rural group were below the average ($p=0.018$).

The establishment of objectives as a before-after measurement resulted in the identification of five major areas to intervene: self-care, play, sensorimotor play, school occupational performance and social participation with the family. Table 4 shows the area, the objective, the importance and difficulty of the objective, the initial-final measurement, and the change in terms of gain or loss/total score.

Overall, in the self-care and play goals, including schedules, habits, routines and child play with the family, the gain was represented using three units, with self-care and play moving to a better-than-expected goal and to a much better than expected goal, respectively. Furthermore, the best performance was observed in the social participation with the family area, where a gain of four units was identified, moving to a much better than expected objective.

Regarding the specific results of the intervention, a total of twelve sessions were planned and executed, in which 94% of the families participated. A total of 156 messages were sent via WhatsApp and/or SMS as reminders.

Table 3. Results of the standardized tests as baseline.

	Peri-urban group (N=9)	Rural group (N=4)	P-value
Sensory Profile 2 (SP-2)			
Search			
Mean (SD)	23 (5.59)	18 (3.92)	0.188
Avoidance			
Mean (SD)	19.4 (6.58)	22 (7.70)	0.587
Sensitivity			
Mean (SD)	22.9 (6.64)	23.8 (12)	0.938
Registry			
Mean (SD)	15.4 (4.53)	18.8 (9.60)	0.751
Sensory			
Mean (SD)	35.8 (8.21)	35.8 (11.1)	0.997
Behavioral			
Mean (SD)	45 (12.7)	46.8 (18.2)	1
Sensory Processing Measure (SPM)			
Social Participation			
Mean (SD)	52.2 (6.18)	50 (7.62)	0.587
Interpretation			
Typical (40T-59T)	8 (88.9%)	4 (100%)	1
Vision			
Mean (SD)	62.3 (4.56)	68 (7.87)	0.211
Interpretation			
Some Problems (60T-69T)	6 (66.7%)	1 (25%)	0.257
Hearing			
Mean (SD)	59 (8.59)	63.8 (10.1)	0.391
Interpretation			
Some Problems (60T-69T)	5 (55.6%)	0 (0%)	**0.0344**
Touch			
Mean (SD)	63.7 (5.72)	65.8 (4.65)	0.757
Interpretation			
Some Problems (60T-69T)	5 (55.6%)	3 (75%)	0.396
Body Awareness			
Mean (SD)	62.7 (5.39)	62.3 (3.59)	0.816
Interpretation			
Some Problems (60T-69T)	6 (66.7%)	3 (75%)	0.786
Balance and Motion			
Mean (SD)	54.4 (6.62)	57.3 (11.9)	0.875
Interpretation			
Typical (40T-59T)	7 (77.8%)	3 (75%)	0.208
Planning and Ideas			
Mean (SD)	49 (5.59)	51.3 (2.87)	0.581
Interpretation			
Typical (40T-59T)	9 (100%)	4 (100%)	0.166
Total Sensory Systems			
Mean (SD)	62.7 (4.74)	65.3 (6.24)	0.393
Interpretation			
Some Problems (60T-69T)	7 (77.8%)	2 (50.0%)	0.277
Developmental Profile 4 (DP-4)			
Physical			
Mean (SD)	101 (9.88)	94.5 (19.5)	0.315
Range			
Average	8 (88.9%)	2 (50%)	0.208
Adaptive Behavior			
Mean (SD)	113 (6.06)	106 (22.9)	1
Range			
Average	6 (66.7%)	1 (25%)	**0.018**
Social-Emotional			
Mean (SD)	106 (10.9)	105 (18.9)	0.877
Range			
Average	8 (88.9%)	2 (50%)	0.411

Table 3. Continued...

	Peri-urban group (N=9)	Rural group (N=4)	P-value
Cognitive			
Mean (SD)	111 (17)	114 (27.6)	0.698
Range			
Above Average	5 (55.6%)	0 (0%)	0.159
Communication			
Mean (SD)	111 (13.4)	106 (18.3)	0.756
Range			
Above Average	5 (55.6%)	2 (50%)	0.719
General			
Mean (SD)	105 (7.03)	103 (18.3)	0.938
Range			
Average	9 (100%)	3 (75%)	0.665

Table 4. Work area, proposed objective, measurement and change of objective (GAS scale).

Area	Objective	Importance*	Difficulty*	Weight**	Baseline***	Achieved***	Change ($x_{1B} - x_{2A}$)
Self-care	To identify the importance of establishing schedules to strengthen good habits and routines at home.	3	2	6	-2	1	Three units gain
Play	To recognize the importance of play in child development so that it can be used in the family as a means and an end.	1	1	1	-1	2	Three units gain
Sensorimotor play	To establish the importance of sensorimotor play in child development, favoring taste/olfactory, touch, and movement sensations.	1	1	1	0	2	Two units gain
School occupational performance	To establish relationships between the school, the child's abilities, and the family and social contexts, favoring the understanding of these three components in child development.	3	2	6	-1	1	Two units gain
Family social participation	To know and use therapeutic games in families that favor quality interaction and increase the variety of activities conducted at home.	2	2	4	-2	2	Four units gain
TOTAL				28,7		69	40,3

*Importance and difficulty are rated on four-point scales: (0) not at all important or difficult; (1) a little important or difficult; (2) moderately important or difficult; (3) very important or difficult; **Weight: Importance x difficulty; ***Evaluation scale: (2) objective achieved much better than expected; (1) objective achieved better than expected; (0) objective achieved as expected; (-1) objective NOT achieved, worse than expected; (-2) objective NOT achieved, much worse than expected.

Discussion

This research uses ICTs to conduct an Occupational Therapy intervention focused on a population group living in rural and peri-urban areas in conditions of vulnerability that had to continue their daily activities in terms of development, health, and well-being despite being highly affected by the pandemic. Furthermore, based on our review of similar experiences, this is the first study of this type to be conducted in Colombia and pioneer research in this subject in Latin America.

Regarding the characteristics of the 13 participating families, it was found that in 92.3% of the families the head of the household was a woman, 77% were low socioeconomic households, 23% were victims of forced displacement, and more than 50% had an annual income of less than 3,000 USD. As for the results of the tests, according to the SP-2 results, children living in peri-urban areas showed interest in sensory experiences, however, those living in rural areas showed discomfort. In the case

of the SPM, problems in specific areas such as vision and listening were identified in both groups, especially in rural children, as well as in the touch and body awareness areas. On the other hand, DP-4 results revealed that, compared to children living in peri-urban areas, those living in rural areas had difficulties in the adaptive behavior category. Finally, the ergonomic conditions assessment contextualized the reality of study-related activities amidst the COVID-19 pandemic by characterizing school spaces at the dining table, as well as furniture and posture-related difficulties.

The evaluation of the change resulting from the intervention was conducted based on the GAS strategy scale by establishing objectives before the intervention and reevaluating them after it was completed, with an emphasis on the following areas: self-care, play, sensorimotor play, school occupational performance and social participation with the family. As it was shown in the results section, gains were observed in all objectives after the intervention, with the highest gain in the social participation with the family area, where it moved to a much better objective than expected.

The above results must be discussed in light of different findings that have been reported in recent years, for example, a 2017 systematic review that included families/children with autism (ASD) and focused on telehealth in the context of rurality, found that these interventions can help improve social behavior and communication skills in children; in addition to benefiting parents, not only in terms of family engagement, but in terms of coping with barriers to accessing traditional services (Parsons et al., 2017). Similarly, a study in which a 12-week telehealth intervention was conducted by occupational therapists in families of children with ASD, showed greater efficacy of parents and children in terms of social participation ($p < 0.05$) and an increase in their adaptive behavior to virtual health promotion activities(Little et al., 2018).

The research by Kronberg et al., which is highly like our study, identified that through a nine-week program and additional health providers, the fulfillment of children's goals (e.g., social participation) and the increase in the level of knowledge and the level of satisfaction of parents with their children's development can be promoted (Kronberg et al., 2021). Undoubtedly, an aspect to be discussed between this and other studies is the importance of balancing the number of objectives with the length of the programs, to have more precise and effective interventions in terms of results achievement. We also agree with the need to consciously evaluate the needs of the child and the family, since these may vary according to the type of need, time of work, message transmitted, among others (Kronberg et al., 2021; Little et al., 2018).

On the other hand, the design and results of this study do not differ from those reviewed by Ogourtsova et al. in a review focused on children with developmental disabilities (Ogourtsova et al., 2019). In this sense, although our study population was placed in a vulnerability and confinement situation due to the COVID-19 pandemic, the results effectively complement the current models of service delivery, provide additional support to families in need and offer additional information for the detection of developmental disorders, but also for the stimulation and adaptation of adequate spaces for learning and growth. This review also included aids such as telephone support (consisting of personalized guidance to improve internet connectivity and follow-up activities regarding the attendance of families to the sessions), and, although in the present study the evaluation of these aids is limited, their use may be related to the gains observed in the established objectives and their subsequent follow-up (Ogourtsova et al., 2019).

In the same vein, a study conducted in 2022 reaffirmed the potential of telerehabilitation as an intervention option, and, to a certain extent, as an effective option compared to usual provision of care (Ogourtsova et al., 2023). The most relevant and direct justification of our study was the finding as a reference method when there are access restrictions caused by geographical location (rural), confinement measures, mobility problems inherent to the user's condition other mobility restriction measures that demand the provision of care services to people living in vulnerability (Ogourtsova et al., 2023). Finally, in the present study we considered there are two main aspects to be discussed: first, the need to expand the use of telehealth or telerehabilitation interventions beyond children with disabilities or specific diagnostic groups, and use them in children that, due to their immediate context (as it was the case in this study), are also in need of such interventions, and second, the need for conducting more high quality studies in Latin America on this topic in order to make context, reality and access adjusted comparisons.

Other results, such as the high participation of families in the therapeutic intervention and, therefore, the use of telehealth, are related to findings reported in previous studies (Báez-Suárez et al., 2022; Ogourtsova et al., 2023). Similarly, through the high attendance and permanence in the sessions by families observed in this study, results such as a strong therapeutic relationship, the successful adaptation of objectives for families and children, and the adequate addressing of needs and benefits perceived by participants can be transposed (Báez-Suárez et al., 2022; Camden & Silva, 2021; Kronberg et al., 2021; Ogourtsova et al., 2023; Tanner et al., 2023).

Rurality and telehealth for parents/caregivers have been discussed in other studies (Moreno-Chaparro et al., 2022); however, there is still a need to apply specific approaches and emphasize the opportunities that telehealth offers in terms of improving health care, such as those providing specialized services (Phillips et al., 2021) or comparing virtual vs. face-to-face occupational therapy interventions (Tanner et al., 2023).

The above set of interventions and approaches calls for the need to inquire and learn more about the diverse ways to carry out, evaluate and monitor telehealth based occupational therapy interventions. Undoubtedly, in the case of Occupational Therapy, telehealth seeks to overcome organizational barriers in the provision of health care services and solve accessibility problems, among others, but even more importantly, it proposes an approach that includes innovation, specialization of services and research on the best model to provide the best optimal intervention (Camden & Silva, 2021) by shifting the traditional paradigm of care provision to one mediated by technology in which the competencies of occupational therapists are highlighted as they take on contemporary challenges and global realities. This requires rethinking the training processes of occupational therapists.

Strengths and limitations

The main limitation of the present study is the small number of participants, which not only affects the results derived from the statistical analysis of data, but also the probability of finding differences, similarities and of evaluating the results more accurately. Given the circumstances, the margin for including more families was narrow,

so this limitation must be considered by future studies on this topic. Another limitation is the natural, geographic, access and vulnerability differences among the participating families. In this regard, although we focused on families with a greater need of assistance in the context of the COVID-19 pandemic, conducting studies involving families with different socioeconomic levels and living in different rural, peri-urban, and urban areas is necessary. The final limitation was the impossibility of conducting and evaluating all initial tests at the end of the intervention, which could not be done because of additional costs and efforts that were not affordable due to the instability existing in the stages of the pandemic.

On the other hand, this study has multiple strengths, as is one of the first studies addressing telehealth based occupational therapy interventions in vulnerable families in a Latin American country and in the context of a pandemic. Another strength was the ability to modify, adapt and transmit occupational therapy interventions using virtual means with additional aids such as the use of social networks and text messaging. Another aspect to be highlighted in the present study is the provision of care to the most vulnerable population amidst the pandemic, which reaffirms the mission of the profession and of the academy to serve the community.

Implications for practice

This study makes positive contributions to the use of telehealth for the provision of occupational therapy care to parents and caregivers of children living in vulnerability and confinement conditions, the latter being imposed due to the health crisis caused by the COVID-19 pandemic. Context-based occupational interventions, as well as their needs, goals, and gains, seem to be a good route for assessment, training, therapy and outcomes for both, families, and children. Adaptations and modifications to the telehealth-based approach regarding the use of different media and broader action strategies are suggested.

Conclusions

In the present study, telehealth-based occupational therapy intervention with a contextual occupation-based approach appears to have had a significant impact on the participating peri-urban and rural families. The 13 families who completed the program did so with high attendance and satisfaction rates, the proposed goals such as self-care, play, sensorimotor play, occupational performance in school, and family participation had measurable but also important qualitative gains for the family. During the pandemic, we can highlight programs like this to focus on family, occupational and child performance. For a next study we hope to analyze differential qualitative outcomes for families during adverse contexts such as the pandemic, social restriction or distancing, adaptations in daily life, among others. Interventions can be particularly targeted towards occupations involving social participation, play and schooling. More studies with a regional, cultural, and contextual (especially Latin American) approach are needed.

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