Multisensory child circuit in primary care: a transdisciplinary approach to neuropsychomotor development

Circuito multissensorial infantil em atenção primária: uma abordagem transdisciplinar para o desenvolvimento neuropsicomotor

Circuito multisensorial infantil en atención primaria: una aproximación transdisciplinar al desarrollo neuropsicomotor

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RESUMO

Objetivo: Relatar a implementação de um circuito multissensorial para prevenir e intervir em transtornos do desenvolvimento neuropsicomotor em crianças de 6 a 10 anos. Metodologia: Estudo qualitativo realizado com crianças de 6 a 10 anos com TEA, TDAH, déficits motores e atraso de linguagem. O circuito foi estruturado em estações motoras, cognitivas e de integração, com 10 sessões de 1h30. Avaliações pré e pós-intervenção foram realizadas utilizando o Protocolo de Avaliação Fonológica Infantil (PAFI) e a Escala de Desenvolvimento Motor. Resultados: Houve melhorias nas áreas motoras, cognitivas e sociais. Crianças com TEA apresentaram avanços na socialização e comunicação não verbal, enquanto aquelas com TDAH demonstraram maior controle motor e concentração. A participação dos responsáveis foi essencial para o sucesso da intervenção. Conclusão: O circuito multissensorial foi eficaz na promoção do desenvolvimento neuropsicomotor, especialmente com a participação ativa dos responsáveis e a abordagem transdisciplinar.

Descritores: Atenção Primária à Saúde; Intervenções multissensoriais; Saúde da Criança.

ABSTRACT

Objective: To report the implementation of a multisensory circuit designed to prevent and intervene in neuropsychomotor developmental disorders in children aged 6 to 10 years. Methodology: A qualitative study conducted with children aged 6 to 10 years diagnosed with ASD, ADHD, motor deficits, and language delays. The circuit was structured into motor, cognitive, and integration stations, with 10 sessions lasting 1.5 hours each. Pre- and post-intervention assessments were carried out using the Child Phonological Assessment Protocol (PAFI) and the Motor Development Scale. Results: Improvements were observed in motor, cognitive, and social areas. Children with ASD showed advancements in socialization and nonverbal communication, while those with ADHD demonstrated better motor control and concentration. The involvement of caregivers was essential for the success of the intervention. Conclusion: The multisensory circuit was effective in promoting neuropsychomotor development, particularly with the active participation of caregivers and the transdisciplinary approach.

Descriptors: Primary Health Care; Multisensory interventions; Child Health.

RESUMEN

Objetivo: Reportar la implementación de un circuito multisensorial para prevenir e intervenir en los trastornos del desarrollo neuropsicomotor en niños de 6 a 10 años. Metodología: Estudio cualitativo realizado con niños de 6 a 10 años con TEA, TDAH, déficits motores y retraso del lenguaje. El circuito se estructuró en estaciones motoras, cognitivas y de integración, con 10 sesiones de 1h30. Las evaluaciones pre y post intervención se realizaron utilizando el Protocolo de Evaluación Fonológica Infantil (PAFI) y la Escala de Desarrollo Motor. Resultados: Hubo mejoras en las áreas motora, cognitiva y social. Los niños con TEA mostraron avances en la socialización y la comunicación no verbal, mientras que los que tenían TDAH demostraron un mayor control motor y concentración. La participación de los responsables fue esencial para el éxito de la intervención. Conclusión: El circuito multisensorial fue efectivo para promover el desarrollo neuropsicomotor, especialmente con la participación activa de padres y tutores y el enfoque transdisciplinario.

Descriptores: Atención Primaria de Salud; Intervenciones multisensoriales; Salud Infantil.

ORIGINAL

Introduction

Child development is a dynamic and continuous process, which encompasses the acquisition of a wide variety of skills essential for healthy growth. These skills range from motor and sensory to cognitive, language, psycho-emotional and social skills. This period is characterized by rapid and significant changes in the child's physical and mental capacities, markedly influenced by biological and environmental factors.[1] The relevance of childhood experiences is widely recognized, as it has a lasting impact on the course of human development and is fundamental for health and well-being throughout adult life.

Within the specialized literature, neuropsychomotor development stands out as a critical area, particularly in the first years of life, when the central nervous system undergoes a continuous process of evolution. During this phase, the brain has a high sensitivity to external stimuli and therapeutic interventions, which makes early actions a key factor for correcting deviations and preventing long-term difficulties[2]. If not treated properly, developmental delays or alterations can result in significant consequences, including motor and cognitive impairments, learning disabilities, behavioral disorders, and ultimately impairments in several areas of the child's functioning, such as school performance and social interactions[3].

Childhood is often divided into developmental cycles, each with its own specific characteristics and challenges. According to Papalia et al.[4], third childhood, which includes the age group from 6 to 11 years, represents a critical period for the maturation of motor and cognitive skills. In this phase, a notable increase in brain processing capacity is observed, reflected in superior cognitive efficiency and an expanded capacity for concentration. In addition, the development of fine and gross motor skills advances considerably, making it possible to perform daily activities such as writing, playing sports, and other coordinated movements. This period is also characterized by greater independence and the increasing ability of children to perform more complex tasks autonomously.

However, this same period is challenging for many children who face conditions that negatively affect their development. Disorders such as Autism Spectrum Disorder (ASD), Attention Deficit Hyperactivity Disorder (ADHD), specific learning disorders, and language delays can compromise the motor and cognitive progress expected for the age group[3]. These disorders impact not only school performance, but also the development of interpersonal relationships and social behavior, which makes early identification and treatment even more crucial. Interventions carried out as early as possible can significantly mitigate the long-term consequences, promoting better adaptation and integral development[2].

In this context, public health policies play a vital role in ensuring the necessary support so that all children can reach their full potential. The National Policy for Comprehensive Child Health Care, implemented by the Ministry of Health, establishes that multiprofessional care is an essential element to ensure healthy and comprehensive child development[5]. Interprofessionality is, in this sense, emphasized as a strategy that integrates different knowledge and practices of health professionals, creating a complete approach that considers physical, emotional and social aspects of child development [6].

Within Primary Health Care (PHC), promotion and prevention actions are prioritized to provide a favorable environment for the full development of the child. The provision of services aimed at the early detection of delays and interventions in critical areas is an effective way to promote child health. Interprofessional interventions that integrate disciplines such as physiotherapy and speech therapy have been shown to be effective for children with sensorimotor, cognitive or language impairments. The fusion of different knowledges provides a holistic and transdisciplinary approach, which overcomes the limitations of isolated practices and provides a broader and more integrated view of child development[6].

This article describes the creation and implementation of a multisensory circuit designed for children aged 6 to 10 years, attended at a Basic Health Unit (BHU). Developed by a transdisciplinary team composed of physiotherapists and speech therapists, the circuit aims to prevent and minimize delays in neuropsychomotor development. The proposal is based on a transdiagnostic approach, focused on early intervention in communicative and motor skills, in addition to promoting the socialization and integration of participating children. Interprofessional work, associated with the use of multisensory resources, offers an enriching environment that strengthens family bonds and contributes to broader and more effective health care.

In this sense, the objective of this study is to report the implementation of a multisensory circuit aimed at children aged 6 to 10 years, with the purpose of preventing and intervening in neuropsychomotor developmental disorders in the context of Primary Health Care.

Methodology

This study is an experience report with a qualitative approach, focused on the implementation of a multisensory circuit for children aged 6 to 10 years treated at a UBS. The methodology adopted aimed to describe in detail the interventions carried out by an interprofessional team, composed of physiotherapists and speech therapists, who planned and conducted the circuit for children with specific developmental conditions.

The structure of the multisensory circuit was designed to provide a comprehensive therapeutic environment that encompasses motor, cognitive and social aspects, stimulating the integral development of children. This circuit was divided into stations that promoted the development of varied skills, respecting the rhythm of each participant and using a transdiagnostic approach[3]. This approach, which goes beyond specific diagnoses, has allowed interventions to be tailored to meet the diverse needs of children, regardless of their diagnosed conditions.

Population and Inclusion/Exclusion Criteria

The study included children of both sexes, between 6 and 10 years old, who had specific diagnoses such as Autism Spectrum Disorder (ASD), Attention Deficit Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), functional motor deficits, speech sound disorders and phonological delay. These diagnoses were made by the multidisciplinary team of the UBS, based on clinical and technical criteria, using standardized assessment instruments[7,8].

Inclusion criteria were established that required a previous diagnosis of one of the conditions mentioned and the child's ability to participate in the proposed activities, with the accompaniment of a guardian during the sessions. Children with severe medical conditions, such as severe heart disease that compromised safety, or with severe motor and cognitive limitations that made it impossible to perform activities were excluded from the study.

Initial Assessment and Screening

All children underwent an initial screening that included a multiprofessional evaluation. Speech therapy used the Child Phonological Assessment Protocol (PAFI)[7] and physiotherapy applied the Motor Development Scale[8]. These evaluations were carried out in a welcoming and playful environment, which minimized anxiety and promoted the children's cooperation. The use of these tools allowed a detailed understanding of the sensory-motor and communicative conditions of each child, facilitating the personalized adaptation of activities.

Intervention and Structure of the Circuit

The circuit was structured so that children participated in 10 weekly sessions, lasting 1h30 per session, divided into two age groups: 6 to 8 years old and 8 to 10 years old. The sessions followed a defined structure, consisting of three main phases:

1. **Cognitive Stations:** Focused on stimulating skills such as memory, attention, and logical reasoning. Games and playful strategies were used to stimulate cognitive abilities in a fun and engaging way 4. Sensory integration was fundamental to improve the processing of information and the response to cognitive demands.[7]

2. **Motor Stations**: Aimed at the development of fine and gross motor coordination, in addition to strengthening balance and strength. Exercises with balls, ropes and obstacles were incorporated, creating a dynamic and challenging environment. The activities were adapted to respect the limitations and potentialities of each child[8].

3. **Integration Dynamics:** Carried out at the beginning and end of each session to strengthen socialization among children and promote bonding with their guardians. These activities included conversation circles, group games and emotional regulation exercises, essential for social interaction.[6]

Reassessment and Monitoring

At the end of the 10 sessions, a reassessment was carried out using the same instruments applied in the initial assessment to measure the children's progress. Interviews with the caregivers provided qualitative feedback on the observed changes. Children who needed continuous monitoring were referred to rehabilitation services at the UBS or other units in the region, ensuring continuity of care[5].

Results

The results observed at the end of the multisensory circuit revealed important advances in several areas of child development. Children diagnosed with Autism Spectrum Disorder (ASD) showed significant improvements in socialization and nonverbal communication. They began to respond better to interaction stimuli and showed greater engagement in group activities. Children with Attention Deficit Hyperactivity Disorder (ADHD) have shown remarkable advances in the ability to concentrate and motor control. The team's observations pointed out that these children began to maintain focus for longer periods during the proposed activities and to demonstrate greater control in their movements, directly reflecting on the execution of tasks at the motor stations.

Motor stations, in particular, have contributed significantly to the development of coordination, balance, and muscle strength. Activities such as jumping, climbing small obstacles, and manipulating different objects provided a safe and stimulating environment for children to develop their motor skills. This evolution was measured in the reassessment with the Motor Development Scale[8], which indicated a consistent improvement in the fine and gross motor coordination indices.

The active participation of legal guardians during the sessions was a determining factor for the success of the circuit. They not only accompanied the children, but also participated in some dynamics, which strengthened family ties and promoted a supportive and safe environment. This constant presence facilitated the application of the guidance provided by the multiprofessional team at home, creating a continuity of the practices developed during the circuit.

Discussion

The results of this study reinforce the importance and efficacy of early interventions in children with neuropsychomotor developmental disorders, especially when these interventions are carried out through interprofessional and transdisciplinary approaches. The literature confirms that early intervention is crucial to minimize developmental delays, preventing long-term consequences that can compromise children's school performance, interpersonal skills, and quality of life [3]. This study adds to the argument that the use of a multisensory circuit can act as an effective strategy to fill these developmental gaps and provide a solid foundation for healthy child growth.

Children diagnosed with ASD, ADHD, and other specific disorders face challenges that often overlap, affecting both motor and cognitive and social development[3]. The multisensory circuit described in this study addressed these issues in an integrated way, offering an environment where motor and cognitive stimuli were combined in a playful and adapted space. This approach is consistent with the literature, which highlights the importance of therapeutic interventions that consider the child as a whole, respecting his or her pace of learning and development.[7,8]

The presence and performance of an interprofessional team were fundamental to the success of the project. The integration between physiotherapists and speech therapists allowed an exchange of knowledge and strategies that enriched the planning and execution of activities. The National Policy for Comprehensive Child Health Care[5] already emphasizes the relevance of teamwork to ensure comprehensive and quality care. In the present study, this collaborative practice proved to be a powerful tool to holistically address children's needs. Interprofessional collaboration also allowed the team to quickly adapt activities based on continuous feedback and observations made during the sessions.

Transdisciplinarity was an approach that transcended the isolated performance of each professional, allowing a broad and unified view of child development. The integration of different knowledge made it possible for the planned activities to be more effective in achieving the proposed objectives, meeting both the physical and emotional and social needs of the children. Previous studies have suggested that this integrated approach results in amplified benefits for motor and cognitive development [6].

Another point discussed was the role of family members in the intervention process. The literature confirms that the involvement of caregivers is a decisive factor for the consolidation of skills learned during therapeutic sessions 4. During the circuit sessions, the participation of parents and guardians allowed the practices carried out to be replicated at home, promoting a continuous supportive environment that enhanced the results of the interventions.

The results of this study have significant implications not only for children's individual development, but also for public health in general. Early intervention in developmental disorders contributes to reducing future demands for specialized health and education services, promoting school and social inclusion, and reducing barriers to fuller participation in society 3. This shows that programs such as the multisensory circuit can be seen as public health promotion strategies with the potential to generate positive impacts in the medium and long term.

Conclusion

This study presented a detailed report on the implementation of a multisensory circuit for children aged 6 to 10 years, highlighting the benefits of an interprofessional and transdisciplinary approach to the promotion of neuropsychomotor development. The results obtained reinforce the importance of early interventions, showing that an integrated performance between physiotherapists and speech therapists can provide significant advances in motor, cognitive and social skills.

The active participation of those responsible was a vital component for the success of the intervention, enabling a continuity of practices in the family environment and a more solid support for the development of the children. The multisensory circuit has proven to be an effective and viable tool in Primary Health Care settings, with the potential to be replicated in different contexts, expanding access to quality health care for children with developmental disorders.

The experience reported in this study serves as a basis for the implementation of similar strategies in other locations, contributing to a care model that considers the child as a whole, promoting a more balanced and sustainable development.

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