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NEUROFEEDBACK AND COGNITIVE TRAINING FOR CHILDREN WITH AUTISM SPECTRUM DISORDER: A SYSTEMATIC REVIEW

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INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in communication and social interaction, as well as restricted and repetitive patterns of behavior (American Psychiatric Association, 2014). Among the emerging therapeutic approaches, neurofeedback (NFB) and cognitive training have been gaining prominence. NFB is a non-invasive technique that aims to modify brain activity by monitoring and conditioning brain waves (Fuentes, 2021). This study seeks to investigate the effectiveness of these therapies in the treatment of ASD, analyzing recent scientific evidence in order to consolidate science as a path to be followed.

METHODOLOGY

This systematic review was conducted in accordance with the PRISMA guidelines. Randomized clinical trials or pre- and post--intervention studies, published from 2015 onwards, in English and/or Portuguese, were included. The following search strategy was used: "neurofeedback" AND "cognitive training" AND "autism spectrum disorder" AND "child". Literature reviews, studies dealing with other age groups and patients with other associated conditions were excluded. The search was carried out on the *PubMed*, *LILACS*, *Scielo* and *Cochrane* databases, using the PICO strategy. Two independent reviewers analyzed titles and abstracts, and the eligible studies were evaluated in full. The data was qualitatively synthesized, considering the type of study and the main findings.

RESULTS AND DISCUSSION

22 studies were identified, 8 of which met the inclusion criteria. Among them, 5 were pre- and post-intervention studies, 2 were randomized and 1 was published in conference proceedings. Only one study (Kang *et al*., 2025) did not report symptomatological improvement with NFB, as it focused exclusively on brain plasticity, without evaluating behavioral changes. The other studies pointed to benefits of NFB in areas such as social interaction (Datko *et al*., 2018; Saleem *et al*., 2023), perception and cognition, expressive language (Wang *et al*., 2024), communication (Saleem *et al*., 2023) and emotional recognition (Friedrich *et al*., 2015). The main methodological limitations observed include small samples, subjective evaluations by caregivers, a high drop-out rate and the need for a longer intervention time. To consolidate NFB as an effective approach for ASD, studies with greater methodological rigor and longitudinal follow-up are needed.

CONCLUSION

NFB and cognitive training show promising therapeutic potential for the management of ASD symptoms, but there is still a need for more studies that adopt more extensive protocols, with a greater frequency of sessions and strategies that favor patient adherence. The improvement of social interactions, frequently reported in the studies analyzed, is a relevant contribution to quality of life, promoting healthier family ties and better social integration.

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