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SCIENTIFIC ARTICLE - INTEGRATIVE REVIEW

IMPACT OF EARLY INTERVENTIONS ON THE DEVELOPMENT OF CHILDREN WITH AUTISM SPECTRUM DISORDER

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ABSTRACT

Introduction: Autism spectrum disorder (ASD) can be defined as a complex developmental disorder with multiple etiologies and varying degrees of severity. The main characteristics of ASD are persistent impairments in social interaction and reciprocal communication, along with restricted and repetitive patterns of behavior, activities, and interests. Furthermore, symptoms appear from early childhood and may impair or limit the individual's daily functioning. **Objective:** To establish the importance of early interventions in children with ASD, which contribute to a better prognosis. **Method:** An integrative literature review conducted through database searches, including studies published between 2017 and 2023. **Results:** A positive relationship was observed between early interventions in children with ASD and better clinical outcomes. Some studies suggest that the earlier the intervention is carried out, the better the results. An association was also identified between the children's pre-existing characteristics and the magnitude of the benefits obtained. Additionally, there was a positive correlation between the active involvement of parents and caregivers and the effectiveness of the intervention. **Conclusions:** Early interventions, combined with the active participation of parents and caregivers, are associated with a better prognosis in children with ASD, especially when initiated as early as possible and tailored to the child's individual characteristics.

Keywords: Autism spectrum disorder, Child, Early medical intervention, Clinical evaluation, Multidisciplinary treatment.

INTRODUCTION

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by multiple etiologies and wide variability in clinical presentation and symptom severity. It represents a condition that affects different domains of human functioning, ranging from communication to adaptive behavior, and requires a careful clinical approach. Currently, the term ASD encompasses a range of diagnoses that were previously classified as distinct entities, such as childhood autism,

Kanner's autism, atypical autism, high-functioning autism, childhood disintegrative disorder, pervasive developmental disorder not otherwise specified (PDD-NOS), and Asperger's syndrome. This unification of diagnoses was proposed to better reflect the continuous spectrum of manifestations and to facilitate the standardization of diagnostic criteria, thereby broadening clinical understanding of the condition.[1,2]

The core features of ASD include persistent deficits in social interaction and reciprocal communication, as well as restricted and repetitive patterns of behavior, interests, and activities. These signs may range from subtle difficulties in social communication to severe impairments in interpersonal contact, often accompanied by cognitive rigidity and increased sensory sensitivity. Such manifestations typically emerge in the first years of life, often before the age of three, and tend to persist throughout the lifespan, significantly impacting an individual's daily functioning. The definition and recognition of these characteristics are essential for diagnosis, which is based on the clinical criteria established by the Diagnostic and Statistical Manual of Mental Disorders (DSM).[2]

Regarding epidemiology, ASD shows a higher prevalence among boys, with an estimated ratio of 3.5 to 4 boys for every girl diagnosed. The World Health Organization (WHO) estimates that, on average, one in every 160 children worldwide presents some degree of the disorder, although more recent population-based studies suggest even higher rates, possibly due to advances in diagnostic methods and greater public awareness. Furthermore, research conducted over the past five decades has shown a significant increase in the global prevalence of ASD, which may reflect both a true rise in cases and the broadening of diagnostic criteria alongside improvements in detection.[3]

Although there is no cure for Autism Spectrum Disorder (ASD), there is a growing range of therapeutic interventions that have demonstrated effectiveness in improving social, communicative, and motor skills, as well as in reducing maladaptive behaviors. Scientific literature highlights that early intervention, especially when initiated in the first years of life, is strongly associated with better outcomes, due to greater neuronal plasticity and the potential to positively influence the course of neurodevelopment. Multidisciplinary strategies involving physicians, psychologists, speech therapists, occupational therapists, and educators have shown particularly promising results when combined with the active participation of the family in the therapeutic process.[1]

Given the functional impact of ASD, its clinical and social relevance, and the progressive increase in its prevalence, the choice of this topic as the object of study is well justified. A comprehensive understanding of the disorder's characteristics, combined with knowledge of the most effective interventions, is essential to improve care and prognosis for these individuals. Therefore, this study aims to discuss the importance of early identification of ASD and to present the main multidisciplinary intervention strategies, highlighting their contribution to more functional development and to the improvement of the quality of life of individuals diagnosed with the disorder.

METHOD

TheThe method chosen to achieve the objective of this study was an integrative literature review. This method aims to identify, analyze, and synthesize the results of independent studies regarding the existing evidence in health practice, thus enabling the development of protocols, policies, procedures, and critical thinking.[4]

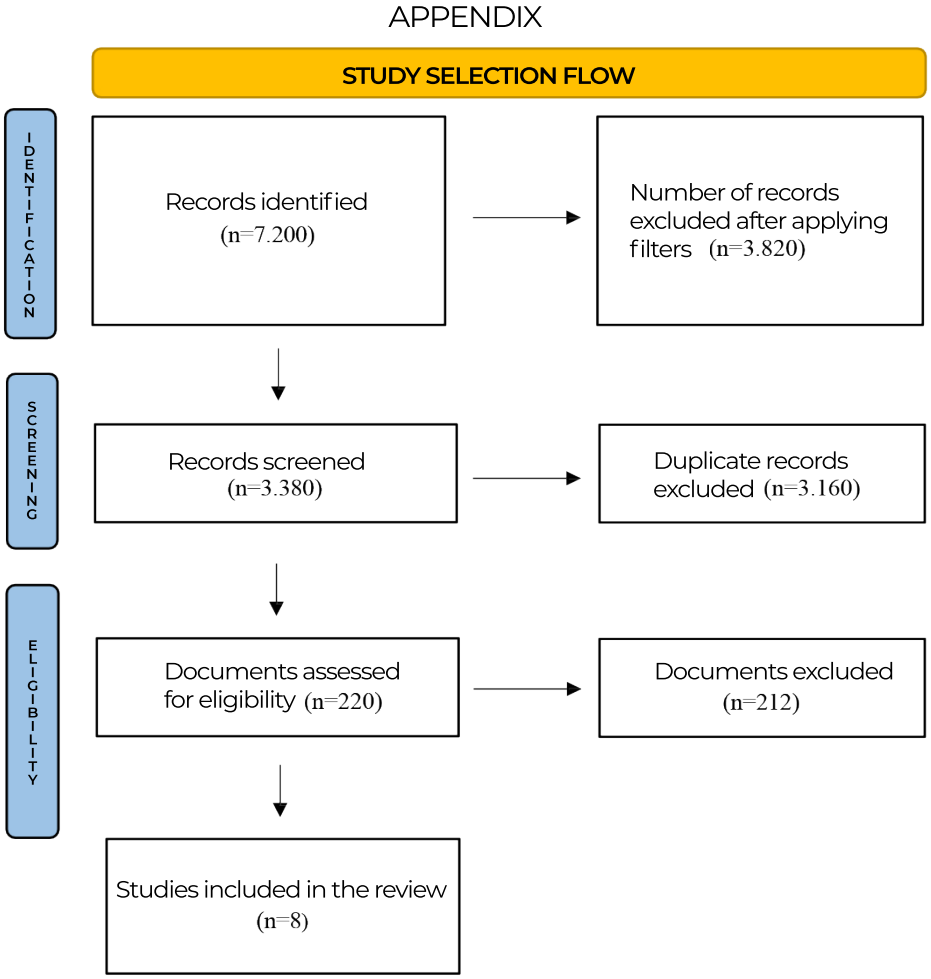
The integrative review consists of six phases. The first phase involves formulating a guiding research question; the second proposes a comprehensive search or sampling in the literature; the third focuses on data collection from the selected articles; the fourth emphasizes critical data analysis according to

the levels of evidence; the fifth aims at discussion of the results; and the sixth involves the clear and complete presentation of the integrative review.[4]

To select the articles, a search was conducted in the following databases: Scientific Electronic Library Online (SciELO), Virtual Health Library (BVS), PubMed, and Google Scholar. The following descriptors and their combinations in Portuguese were used for the search: "autismo" (autism), "transtorno do espectro autista" (autism spectrum disorder), "intervenção precoce" (early intervention), and "criança" (child).

The inclusion criteria were defined as follows: time frame from 2017 to 2023, articles published in Portuguese and English, full-text availability, and indexing in the aforementioned databases. The exclusion criteria included duplicate records, articles not available in full text, and those that, after reading the title and abstract, did not meet the eligibility criteria for this study. The search results are presented in Figure 1, which details the number of studies included and excluded at each stage of the selection process.

Figure 1. Flowchart of the study selection process for the articles included in the review



Source: Prepared by the authors. Adapted from PRISMA (2020).

RESULTS AND DISCUSSION

The study conducted by Vivanti et al.[5] investigated the application of the Group Early Start Denver Model (G-ESDM) in 58 preschool-aged children diagnosed with Autism Spectrum Disorder (ASD). The children were divided into two types of classrooms: one in an inclusive setting, predominantly composed of typically developing children, and another in a specialized setting, consisting exclusively of children with ASD.

According to the authors, no significant differences were found between the groups at baseline regarding age, autism symptom severity, and verbal and nonverbal developmental quotients. Moreover, all caregivers had high levels of professional training. The inclusive classrooms had an average of 12 typically developing children and 1 to 3 children with ASD, while the specialized classrooms accommodated up to 10 children with ASD per day. Professionals in both settings were trained in the implementation of the G-ESDM, which defines specific developmental goals for each child based on their individual profile, covering verbal and nonverbal communication, socialization, cognition, and adaptive skills. These goals were addressed through routine classroom activities and cooperative play, employing naturalistic developmental techniques.[5]

The study found that children with greater social initiative demonstrated more significant benefits in inclusive environments. Those with higher initial social interest showed greater progress after one year of G-ESDM in inclusive classrooms compared to those with lower initial social interest. However, among children in the specialized group, the initial level of social interest did not significantly influence the outcomes.[5]

These findings suggest that both the child's social interest level and developmental stage should be considered by families and professionals when selecting the most appropriate intervention environment. While children with high social interest tend to perform well in both settings, those with low social interest achieved better outcomes in specialized environments. In any case, there were significant improvements in communication and social behavior in both groups, underscoring the benefits of early intervention, regardless of the context in which it is implemented.

In parallel, a meta-analysis conducted by Yu et al.[6] evaluated the effectiveness of interventions based on Applied Behavior Analysis (ABA) in treating various symptoms in children with ASD. A total of 14 clinical trials were included, comprising 555 participants aged 6 to 102 months (up to 8 years and 6 months). Of these, 278 were in the experimental group and 277 in the control group. The analyzed methods included the Early Start Denver Model (ESDM), the Picture Exchange Communication System (PECS), Discrete Trial Training (DTT), and Pivotal Response Treatment (PRT).

The Early Start Denver Model (ESDM) focuses on building affective bonds between the child and the therapist, promoting responsiveness and communication. The Picture Exchange Communication System (PECS) teaches nonverbal children to communicate using pictures. Discrete Trial Training (DTT) is based on direct and repetitive instruction, while Pivotal Response Treatment (PRT) structures the environment to stimulate responses according to the child's interests, functioning as a naturalistic intervention.[6]

The meta-analysis revealed significant effectiveness of ABA-based interventions in socialization, communication, and expressive language. However, no significant differences were found between ABA and ESDM regarding socialization and daily living skills. Effectiveness was considered low for receptive language, adaptive behavior, and cognition. Additionally, it was observed that longer and more comprehensive interventions produced medium-to-large effects on children's functional development,

especially when parents acted as mediators, enhancing reciprocity and social interaction. Nevertheless, the authors highlighted that the limited number of studies makes it difficult to establish conclusive comparisons between methods.[6]

In addition, Towle et al.[7] conducted a review including 14 studies grounded in the theory of neuroplasticity, which considers "critical periods" of development as ideal windows for effective interventions. Early ASD symptoms usually manifest between 12 and 18 months of age, and interventions implemented during this period have the potential to positively alter the developmental trajectory

Of the 14 reviewed studies, 12 reported positive effects of early intervention, with improvements observed in motor skills, receptive language, self-care, and social behavior. The age at which intervention began proved to be a significant predictive factor in approximately half of the studies, reinforcing the importance of early action. To assess the outcomes, instruments such as ADOS, MSEL, and VABS were used.[7]

Torres et al.[8] reviewed 51 studies that evaluated the role of parents in 15 early intervention programs, categorized into four groups according to methodology and focus. The most notable were P-ESDM (Parent-Mediated ESDM), JASPER, and ImPACT (targeting the core symptoms of autism), and PCIT and FTP (focused on parenting and play). The authors emphasized that parent training is essential for the effectiveness of interventions, contributing to better developmental outcomes in children. Among these programs, the Parent Training Program derived from ABA and P-ESDM showed stronger evidence, while PCIT and FTP presented lower levels of empirical support. Overall, active parental involvement and promotion of parent–child interaction were identified as promising strategies to enhance the effectiveness of interventions.

Kitzerow et al.[9] proposed Naturalistic Developmental Behavioral Interventions (NDBI) through the Frankfurt Early Intervention Program for Autism (A-FFIP), a low-intensity, therapist-led approach. The method promotes parent–child interaction, joint engagement, play, imitation, and language development. With a focus on individualization, the intervention covers six key developmental domains, adjusted according to each child's stage. Proper training across these domains aims to enhance child-initiated social learning, generating a positive impact on overall development.

Maye et al.[10] emphasized the importance of positive affect in naturalistic ABA-based interventions (NDBI). The use of facial expressions, gestures, and play seeks to increase child engagement and strengthen emotional bonds. However, few studies have directly analyzed the impact of playfulness on children's responsiveness to interventions. A clinical case illustrated that when adopting a more playful and engaging approach, a previously nonverbal child began to express herself verbally, highlighting the potential of this strategy. The authors noted, however, that responsiveness to playfulness may vary among children, underscoring the need for further research to fully understand its effects.

The study by Viswanathan and Russel[11] investigated predictive factors in parent-mediated early intervention for children with ASD in India. Data from 77 children, with an average age of 3 years, diagnosed according to the DSM-5 and submitted to a 12-week evidence-based intervention, were analyzed. Assessments were conducted before and after the program using the Psychoeducational Profile – Revised (PEP-R), which measures general developmental age, imitation, perception, fine and gross motor skills, eye–hand coordination, and cognitive and verbal subscales. The sessions, structured as closed-group formats, were conducted by two therapists, five times a week, lasting 2 to 4 hours, and included weekly meetings to set individualized goals. Parents received training and were encouraged to continue adapted activities at home.

The results showed that children in residential programs exhibited greater improvement in fine

motor skills compared to those treated on an outpatient basis. Reduced home activity led to declines in gross motor performance, while longer intervention hours in the hospital setting favored eye–hand coordination and cognitive-verbal skills. The study concluded that intensive interventions, approximately 40 hours per week, preferably with active parental participation, maximize motor, cognitive, and language gains, reinforcing the positive role of the family in ASD treatment.[11]

Gomes et al.[12], similar to Viswanathan and Russel[11], advocate for the training of parents and caregivers to carry out early behavioral interventions in children with Autism Spectrum Disorder (ASD). The study included nine children, aged 1 year and 3 months to 2 years and 11 months, all with a diagnosis or suspected diagnosis of autism. The intervention, lasting 8 to 13 months, used the Psychoeducational Profile – Revised (PEP-R) and the Operationalized Portage Inventory (OPI) for evaluation. Activities were conducted at home by trained caregivers, five times per week, three hours per day (totaling 15 hours per week), under weekly supervision by two professionals.

The results showed developmental gains in all children, although four did not show progress in cognitive-verbal performance. Younger children with better initial cognitive and language skills demonstrated the greatest improvements, reinforcing the importance of age and baseline abilities for the effectiveness of early intervention.[12]

CONCLUSION

This article presented an integrative review on early interventions in children diagnosed with Autism Spectrum Disorder (ASD). Although the studies analyzed employed different approaches, they all consistently indicated that early intervention has a positive impact on treatment outcomes, regardless of the method used. The evidence reinforces that initiating treatment as early as possible enhances results, supported by the principle of brain neuroplasticity.

Preexisting child characteristics, such as verbal skills and greater social engagement, were also found to be associated with better outcomes. Another recurring finding was the central role of parents as active agents in the implementation of interventions, which increases their effectiveness. Despite the limited number of studies, which constrains the definition of an ideal age to begin treatment, the evidence suggests that the earlier the intervention starts, the better the outcomes tend to be. Further research is needed to clarify the relationship between the age of onset, type of intervention approach, and the magnitude of improvements in the management of ASD symptoms.

REFERENCES

1. Steffen BF, Paula IF, Martins VMF, López MJ. Diagnóstico precoce de autismo: uma revisão literária. Rev Saúde Multidiscip. 2020;6(2).

2. American Psychiatric Association. Manual diagnóstico e estatístico de transtornos mentais: DSM-5. 5ª ed. Porto Alegre: Artmed; 2014.

3. Viana ACV, Martins AAE, Tensol IKV, Barbosa KI, Pimenta NMR, Lima BSS. Autismo: uma revisão integrativa. Rev Saúde Dinâmica. 2020;2(3).

4. Souza MT, Silva MD, Carvalho R. Revisão integrativa: o que é e como fazer. Einstein (São Paulo). 2010 Mar;8(1):102–6.

5.Vivanti G, Bent C, Capes K, Upson S, Hudry K, Dissanayake C; Victorian ASELCC Team. Characteristics of children on the autism spectrum who benefit the most from receiving intervention in inclusive versus specialised early childhood education settings. Autism Res. 2022 Nov;15(11):2200-2209.

6. Yu Q, Li E, Li L, Liang W. Efficacy of interventions based on applied behavior analysis for autism spectrum disorder: a meta-analysis. Psychiatry Investig. 2020;17(5):432–43.

7. Towle PO, Patrick PA, Ridgard T, Pham S, Marrus J. Is earlier better? The relationship between age when starting early intervention and outcomes for children with autism spectrum disorder: a selective review. Autism Res Treat. 2020;2020:7605876.

8. Torres LPR, Esteban YA, Marín FA. Early intervention with parents of children with autism spectrum disorders: a review of programs. Children (Basel). 2020;7(12):295.

9. Kitzerow J, Hackbusch M, Jensen K, Kieser M, Noterdaeme M, Fröhlich U, Taurines R, Geißler J, Wolff N, Roessner V, Bast N, Teufel K, Kim Z, Freitag CM. Study protocol of the multi-centre, randomised controlled trial of the Frankfurt Early Intervention Programme A-FFIP versus early intervention as usual for toddlers and preschool children with Autism Spectrum Disorder (A-FFIP study). Trials. 2020 Feb 24;21(1):320.

10. Gomes CGS, Sousa DG, Silveira AD, Oliveira IM. Intervenção comportamental precoce e intensiva com crianças com autismo por meio da capacitação de cuidadores. Rev Bras Educ Espec. 2017 Jul-Sep;23(3):435–48.

11. Maye M, Gaston D, Godina I, Conrad JA, Rees J, Rivera R, Lushin V. Playful but Mindful: How to Best Use Positive Affect in Treating Toddlers With Autism. J Am Acad Child Adolesc Psychiatry. 2020 Mar;59(3):336-338.

12. Viswanathan SA, Russel PSS. Predictive components in the structure of an intensive, parent-mediated, early intervention for children with autism spectrum disorders in India. J Family Med Prim Care. 2019;8(2):663–70.

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