


**IMPACT OF LATE ASD DIAGNOSIS ON FUNCTIONAL DEVELOPMENT IN LOW - AND MIDDLE-INCOME COUNTRIES** <https://doi.org/10.63330/aurumpub.044-005>**Ariana Pinheiro Caldas<sup>1</sup>, Thais Oliveira Sousa<sup>2</sup> and Victor Gonçalves Linares<sup>3</sup>****Abstract**

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by difficulties in communication, social interaction, and restricted behavioral patterns. This study aims to analyze the impact of late diagnosis of ASD on the functional development of individuals in low- and middle-income countries. This is an integrative literature review with a qualitative approach, based on scientific articles published in national and international databases. The results indicate that late diagnosis is associated with significant impairments in cognitive, social, and adaptive domains, as well as increased family burden and reduced access to early interventions. It was also observed that factors such as limitations in healthcare systems, lack of professional training, and socioeconomic barriers contribute to delayed diagnosis. It is concluded that early identification of ASD is essential for implementing effective therapeutic strategies, highlighting the need for public policies, professional training, and expanded access to healthcare services to reduce negative impacts on functional development.

**Keywords:** Autism spectrum disorder, Developing countries, Functional development, Late diagnosis, Social vulnerability.

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## INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by persistent deficits in communication and social interaction, associated with restricted and repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 2014). In recent decades, a significant increase in the prevalence of ASD has been observed globally, which has driven advances in clinical recognition, diagnostic criteria, and intervention strategies. Despite these advances, important inequalities in access to diagnosis and care persist, especially in low- and middle-income countries, where structural and socioeconomic limitations hinder the early identification of cases (Elsabbagh et al., 2012).

Early detection of ASD is considered a determining factor for better outcomes in functional development, since it allows the implementation of therapeutic interventions during critical periods of brain development, marked by greater neural plasticity (Dawson et al., 2010). However, in contexts of greater social vulnerability, diagnosis often occurs late, which can significantly impair the cognitive, social, and adaptive development of affected individuals (Lord et al., 2020). This scenario highlights an important gap between the available scientific knowledge and its practical application in healthcare systems with limited resources.

Given this context, the following research question is defined: in what way does late ASD diagnosis impact the functional development of individuals in low- and middle-income countries? This issue involves multiple factors, including the scarcity of trained professionals, the low availability of specialized services, the social stigma associated with neurodevelopmental disorders, and cultural barriers that hinder the early recognition of ASD signs (WHO, 2013).

The general objective of this study is to analyze the impact of late ASD diagnosis on functional development in low- and middle-income countries. The specific objectives are: to identify the main factors associated with diagnostic delay; to analyze the functional impairments resulting from this delay in different areas of development; and to discuss strategies that may favor early detection and broaden access to effective interventions in these contexts.

The relevance of this study is justified by the need to expand understanding of the effects of late ASD diagnosis, especially in vulnerable populations, where inequalities in access to healthcare are more evident. Late identification may result in greater functional impairment, increased family burden, and reduced opportunities for social and educational inclusion (Zeydanli; Fagundes; Silva, 2019). Thus, investigating this phenomenon contributes to the strengthening of more equitable and effective public policies and care practices.

From a theoretical perspective, the literature shows that early interventions, especially those based on behavioral and developmental approaches, are effective in promoting social, communicative, and adaptive skills in children with ASD (Rogers; Dawson, 2010). In addition, studies emphasize that the absence of timely diagnosis and intervention may intensify functional deficits throughout life, affecting individuals' autonomy and quality of life (Lord et al., 2020). Therefore, understanding the impacts of late diagnosis becomes essential for guiding more accessible and effective care strategies, particularly in low- and middle-income countries, where the challenges are even more complex.

## **METHODOLOGY**

### **TYPE OF RESEARCH**

This study is characterized as basic research, with a qualitative approach and an exploratory and descriptive nature, conducted through an integrative literature review. The choice of this method is justified by the possibility of synthesizing and critically analyzing the knowledge already produced on the impact of late diagnosis of autism spectrum disorder (ASD) on functional development in low- and middle-income countries, as pointed out by authors such as Whittemore and Knafl (2005).

### **SEARCH STRATEGY AND STUDY SELECTION**

The search was conducted in national and international scientific databases, such as PubMed, SciELO, LILACS, and Google Scholar, using controlled and uncontrolled descriptors related to the topic,

such as: “autism spectrum disorder,” “late diagnosis,” “functional development,” and “developing countries.” Articles published between 2010 and 2024, in Portuguese, English, and Spanish, that directly addressed the proposed topic were included. Duplicate studies, articles without access to the full text, and those not directly related to the research objective were excluded.

## INCLUSION AND EXCLUSION CRITERIA

Original studies, systematic reviews, meta-analyses, and clinical guidelines addressing ASD diagnosis and its implications for functional development were included. Opinion articles, editorials, isolated case reports, and publications that did not present adequate methodological rigor were excluded. The selection followed the principles of the PRISMA method, aiming to ensure transparency and reproducibility in the study selection process (Moher et al., 2009).

## DATA ANALYSIS

Data analysis was carried out through critical reading and narrative synthesis of the selected studies, allowing the identification of patterns, convergences, and divergences among the findings. The data were organized into thematic categories, considering aspects such as the cognitive, social, and adaptive impact of late diagnosis, as well as factors associated with barriers to access to diagnosis. This approach allows for a broad and in-depth understanding of the phenomenon studied, as suggested by Souza, Silva, and Carvalho (2010).

## EVIDENCE-BASED DISCUSSION

The analysis of the studies shows that late ASD diagnosis is directly related to worse outcomes in functional development, especially in low- and middle-income contexts. According to Dawson et al. (2010), early intervention is essential to take advantage of critical periods of brain development,

promoting significant gains in social and cognitive skills. However, the absence of timely diagnosis limits access to these interventions, increasing difficulties throughout life.

In addition, structural factors, such as the insufficiency of specialized services and the limited training of healthcare professionals, contribute to diagnostic delay, as highlighted by Elsabbagh et al. (2012). The World Health Organization (WHO, 2013) reinforces that healthcare systems in low- and middle-income countries face significant challenges in meeting demands related to neurodevelopmental disorders.

Another relevant aspect is the impact of late diagnosis on the family, which often faces a greater emotional burden and difficulties in managing the individual with ASD without adequate support (Zeydanli; Fagundes; Silva, 2019). Thus, it is observed that the issue involves not only the individual, but also their social and family context, requiring multidisciplinary approaches and effective public policies.

Thus, the methodology adopted makes it possible to comprehensively understand the impact of late ASD diagnosis, highlighting the need for strategies that promote early diagnosis and broaden access to healthcare services, especially in more vulnerable regions.

## **RESULTS AND DISCUSSION**

The findings of this integrative review show that late diagnosis of autism spectrum disorder (ASD) in low- and middle-income countries is associated with significant impairments in functional development, especially in the cognitive, social, and adaptive areas. It is observed that most diagnoses occur after early childhood, a period considered critical for neuropsychomotor development and for the effectiveness of early interventions (Dawson et al., 2010).

In addition, the studies analyzed indicate that children diagnosed late show greater difficulties in language acquisition, lower capacity for social interaction, and greater dependence in activities of daily living. These findings corroborate the literature indicating that diagnostic delay reduces opportunities for evidence-based intervention, negatively impacting functional prognosis (Lord et al., 2020).

**Table 1**

*Main Impacts of Late ASD Diagnosis*

| Development Dimension | Observed Impacts                              | Reference Authors                       |
|-----------------------|---|---|
| Cognitive             | Language delay, learning difficulties         | Dawson et al. (2010)                    |
| Social                | Interaction and social communication deficits | American Psychiatric Association (2014) |
| Adaptive              | Reduced autonomy and greater dependence       | Lord et al. (2020)                      |
| Family                | Emotional burden and management difficulties  | Zeydanli; Fagundes; Silva (2019)        |

The analysis also reveals that structural factors play a central role in diagnostic delay, such as limited access to healthcare services, the scarcity of trained professionals, and the lack of public policies aimed at early ASD screening (Elsabbagh et al., 2012). In low- and middle-income countries, these limitations are even more evident, resulting in inequalities in access to diagnosis and treatment.

According to the World Health Organization (WHO, 2013), healthcare systems with low coverage and limited resources face difficulties in implementing screening and early diagnosis programs, which contributes to the late identification of neurodevelopmental disorders. This scenario reinforces the need for strategies aimed at training primary care professionals and expanding access to specialized services.

Another relevant point identified in the studies is the impact of late diagnosis on the quality of life of individuals with ASD and their families. The absence of early interventions is associated with higher levels of family stress, educational difficulties, and lower social inclusion (Zeydanli; Fagundes; Silva, 2019). Such evidence reinforces the importance of multidisciplinary approaches and integration among health, education, and social assistance sectors.

The literature also highlights that evidence-based early interventions, such as those described by Rogers and Dawson (2010), are capable of promoting significant gains in the development of social and communicative skills. However, limited access to these interventions in low- and middle-income contexts constitutes an important challenge for improving clinical outcomes.

Thus, the results obtained in this review indicate that late ASD diagnosis represents a critical factor that compromises functional development, making it necessary to strengthen public policies, expand the care network, and implement early detection strategies. Overcoming these barriers may significantly contribute to improving the quality of life of individuals with ASD and their families, especially in contexts of greater social vulnerability.

## **CONCLUSION**

The present study aimed to analyze the impact of late diagnosis of autism spectrum disorder (ASD) on functional development in low- and middle-income countries, seeking to understand the main factors associated with this delay and its consequences in the different dimensions of human development.

The results showed that late diagnosis is directly related to significant impairments in cognitive, social, and adaptive development, in addition to implying greater burden for families and reduced opportunities for early intervention. It was also observed that factors such as structural limitations of healthcare systems, scarcity of trained professionals, and socioeconomic inequalities contribute significantly to delays in the identification of ASD.

The contributions of this research consist in reinforcing the importance of early diagnosis as an essential strategy for improving the functional prognosis of individuals with ASD, especially in contexts of greater social vulnerability. In addition, the study highlights the need to strengthen public policies aimed at training healthcare professionals, expanding access to specialized services, and implementing early screening programs.

In view of the findings, it is suggested that future research delves deeper into the analysis of low-cost intervention strategies adapted to the reality of low- and middle-income countries, as well as studies that evaluate the effectiveness of public policies aimed at early ASD diagnosis. It is also important to

develop longitudinal studies that allow the impact of late diagnosis to be followed throughout the life cycle.

Thus, it is concluded that early ASD diagnosis is fundamental for better outcomes in functional development, making it essential to adopt measures that reduce barriers to diagnosis and expand access to appropriate interventions, promoting greater equity and quality of life for individuals with ASD and their families.

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