

Missed Beginnings: How Early Educational Deprivation Shapes Diagnostic Outcomes for Neurodevelopmental Conditions Among Students with Disabilities

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Abstract: *Education in today's world is a necessity, but unfortunately, only in theory. In practical terms, society is ill-equipped to impart accessible, equal, quality education globally, especially in developing countries. Even within quality schooling, however, educational deprivation can manifest as poor-quality home environments with limited cognitive stimulation, a lack of preschools, or, most importantly, unequal access. This disparity can influence the accuracy of diagnosing neurodevelopmental conditions among students with disabilities as adults. Autism, ADHD, dyslexia, and other learning disabilities, if not recognised early on, can adversely affect a child's growth and learning ability. This paper aims to examine how a lack of good education during childhood can delay an accurate diagnosis of neurodevelopmental conditions in adulthood, shaping long-term outcomes among students with disabilities.*

Keywords: neurodevelopmental conditions, childhood, educational deprivation, disability, home environment

1. Introduction

Education in early childhood forms the basis for knowledge, behaviour, and a host of other personality traits in adulthood. However, when a child is deprived of quality learning, faces low cognitive stimulation at home, or doesn't have equal access to education, it can manifest as delayed diagnoses or misdiagnosis of neurodevelopmental conditions among students with disabilities. Child development is an active process, where perceptive, motor, cognitive, linguistic, and social abilities are moulded, allowing for a balanced interaction with their social environment (Ponce-Meza, 2017).

Education does not exclusively refer to the traditional methods in school, but also includes teacher awareness, home environment, and peer interaction. In terms of home environment, parental occupation, educational backgrounds, family income, power, and prestige (Burger, 2010) play an important role in developing the child's cognitive abilities. Teachers, often in developing countries, are not equipped to identify and intervene at the first sign of a neurodevelopmental condition. It is generally attributed to being 'slow'.

Educational deprivation, no matter the form, can affect the timing and diagnosis of underlying, or sometimes evident, neurodevelopmental conditions. When people around the child are unaware of how to identify a condition or are unwilling to intervene on their behalf, it becomes a problem for the child. In turn, if the child is not given appropriate treatment or therapy for the condition on time, it dictates their future cognitive and social abilities, or lack thereof. Every child's development trajectory is unique, but noticing and ignoring repeated signs of a neurodevelopmental issue in a student with a disability can lead to slow intellectual growth going into adulthood.

Child development is a complex, continuous, multidimensional process of change, where people in their

environment have a purpose of responding to possible developmental disorders by monitoring their needs, difficulties, and abilities (Ponce-Meza, 2017). According to Huthsson and Nicholl (1988), early care seeks to understand and detect developmental problems during the initial years of a child's life, which includes information and feedback from health professionals, parents, teachers, and peers. It is advisable to set an intervention program as early as possible, as it contributes to early detection and potential restorative therapy for students who present risks of disabilities (Martínez et al., 2010).

Distinguishable signs of neurodevelopmental conditions include altered motor/cognitive development, language issues, or social interaction. Child development encompasses the maturing of the central nervous system, brain plasticity, and any delays in functions that are off-track by standard age markers. Early detection and intervention, followed by treatment, can positively change and correctly develop functions from the beginning, in an attempt to mitigate biological, psychological, or social risks (Ponce-Meza, 2017).

Limited access to quality education has its roots in socioeconomic status. In the United States, over 12 million children live in poverty, who experience disruptive life events like low-quality healthcare, economic strain, malnutrition, and negligible access to education. Parental stress increases the risk of strained home environments, which can lead to a lack of cognitive stimulation, educational materials, lower language exposure, and behaviour influenced by the negative practices they see around them (Harms & Garrett-Ruffin, 2023). Research on this inconsistency suggests that constant stress manifests as neurodevelopmental conditions, which can go unnoticed in such circumstances.

2. Background

Before the term 'learning disabilities' came about, they were referred to as minimal brain damage, brain dysfunction, or perceptual disorders (Carman & Lim, 2024). There is no

globally accepted definition, which makes it a point of contention. Several neurodevelopmental conditions can be displayed among students with disabilities. The most common ones are Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD), and dyslexia. One definition is “behavioural and cognitive disorders that arise during the development period and result in significant difficulties in the acquisition and execution of specific intellectual, motor, language or social functions” (UNICEF & WHO, 2023). Learning disabilities frequently go unrecognised, leading to postponements in diagnosis and intervention. Traditionally, the identification of learning disabilities stemmed from the gap between a student’s intellectual potential and academic achievement. This model is criticised as a ‘wait-to-fail’ approach, as it hinders diagnosis until a significant gap emerges, leading to misdiagnosis or delays in timely support (Kuriakose & Amaresha, 2024).

Researchers suggest an inclusive education system and related policies, specifically in low- and middle-income countries, to address limited resources that hold them back from implementing inclusive education (Hayes & Bulat, 2017). 15 per cent of the world’s population has some category of disability. According to a World Health Organisation report from 2011, of that percentage, 150 million children have a disability, and 80 per cent of them are from developing nations. Curricula have not been adapted to suit the needs of diverse learners, and teachers may not know how to accommodate such students. Reforming the education system is an ongoing process that every country adapts differently, based on cultural context and current special education programs (Hayes & Bulat, 2017).

Neuroscientific advances show that early intervention in children with developmental delays is crucial to reduce long-term impacts, whether academic, social, or intellectual. Testing neural development in infants/children has well-established parameters, and studies show that in these periods, the brain undergoes intense transformation and formation, where it is more sensitive to environmental experiences, and can be strengthened or moulded in the right ways (Nelson III & Gabard-Durnam, 2020).

There are numerous case studies about early intervention and neurodevelopmental conditions. A 2023 study conducted in the USA showed that 1 in 36 children is on the autism spectrum. Early diagnosis and intervention are crucial to improve the quality of life and other outcomes for the children and their families, specifically before age 2, which provides the optimal opportunity to modify developmental trajectories (Bethlehem et al., 2022). One of the biggest challenges today is the early identification of children with neurodevelopmental conditions within the stipulated age frame. While it is possible to diagnose between 18 and 24 months, the average age is 5 years, and in most cases, it is associated with severe delays in development. Statistically, disproportionate socioeconomic statuses lead disadvantaged groups to have lower participation in early intervention screening and assessment (Lidstone, 2025).

In Brazil, a law dictates a mandatory formal assessment of child development within the Unified Health System. This

must be conducted alongside milestones in the Child Health Booklet. Additionally, the Brazilian Society of Pediatrics recommends that the Modified Checklist for Autism in Toddlers (M-CHAT) be applied at 18 and 24-month visits, looking for early detection of warning signs (Zwaigenbaum & Penner, 2018). A study in primary care centres in Turkey found that the main signs of neurodevelopmental conditions were associated with low parental education, socioeconomic conditions, trauma, neglect, and maltreatment (Demirci & Kartal, 2015; Tonelli et al., 2016; Nelson et al., 2006).

Children with developmental issues face barriers in communicating with family, friends, or peers. There must be proactive, tailored responses, such as interventions, to enhance community engagement and participation during childhood, which will lead to better engagement in adulthood (McIntyre et al., 2010). A thorough review of literature demonstrates that early detection and intervention are vital to reduce and improve long-term impairments in children with disabilities. A collection of markers, along with regulated screening methods, will allow for increased diagnostic accuracy and timely mediation (de Araújo, 2026). The sheer lack of policy and institutional gaps in terms of global education systems and the shortage of special educators make it difficult, if not impossible, to streamline a timely identification of neurodevelopmental disorders in children.

3. Discussion

Different fields use different categorisations and standards, but it is ideal to design practices and policies that consistently support development and early learning goals (Allen & Kelly, 2015) for children across regions. Aside from policymaking, another important aspect of positive engagement with children is the adults’ socioemotional well-being. When caregivers are stressed, they pass on their mood and behaviour to the children, making it difficult to cope. The adults may be uninterested in helping the children with their issues, and could become unpredictable, sad, or hostile towards them (England & Sim, 2009). This extends even to the classroom, where teachers influence the quality of education, even if the home environment is controlled, stimulating, and positive.

Stimulation at home can be defined as simple acts, like reading a book with them, telling stories, singing songs, taking the child for a walk, playing a game, or even just counting or spelling. Studies across countries with sufficient data have shown that children in urban areas are more likely to receive early stimulation when compared to children in rural areas. A stark contrast was seen in a study on households with three or more children’s books—in Ukraine, 91% of children have books at home, while in Burundi, only 0.1% of them have books (UNICEF, 2024).

A UNICEF report states,

“[...]some children do not get a fair start to life. While education is seen as a social equaliser, without government support, vulnerable children will continue to have poor outcomes because of disadvantaged early environments.”

The report marks salient facts about children’s education following the analysis of several research studies. Access to

quality early education is especially important for children from vulnerable communities. This is because they stand to gain the most from early opportunities, enabling foundational skills and improving their prospects. In sub-Saharan Africa, only 19% of children above the age of 3 pursued their pre-primary education, while the figure was 76% in Europe and North America. A small percentage of children have access to day-care or early learning opportunities prior to pre-primary education, meaning they enter the school system with no preparation. This lack of appropriate cognitive and social skills directly affects potential neurodevelopmental conditions in children with disabilities, as caregivers might not notice the subtle signs in their children's behaviour.

Learning disorders are broadly classified as neurodevelopmental conditions indicated by difficulties in reading or writing despite normal intellectual capacity and educational opportunities. These disorders lead to problems in the acquisition, comprehension, retention, and application of information (Aslam & Carugno, 2025), which can, in turn, affect academics and understanding social cues. A study that focused specifically on institutionalised children found that early deprivation factors such as malnutrition, inadequate medical care, stimulation, and a lack of supportive, caring relationships affected normal levels of child development (Pollak et al., 2010).

Cognitive development is an ongoing, evolving concept. The understanding that a young mind is constantly developing should be part of the knowledge that influences how caregivers and educators support young learners. The cognitive abilities of children are often underestimated, where the distinction between explicit and implicit learning is blurred. The explicit knowledge that adults can put into words is different from the implicit knowledge that cannot be described vividly (Mandler, 2004). Therefore, growth appears on two levels: one that is apparent and visible, and one that is more difficult to observe, something inherently present (Allen & Kelly, 2015).

One of the chief concerns surrounding caregiving in educational systems is that teachers receive insufficient training in identifying signs of neurodevelopmental disorders, and overcrowded classrooms. In a home environment, the biggest issue is low awareness among parents about disorders, normalisation of developmental delays, and limited access to specialists. These problems exist globally, but are exacerbated in developing countries.

To combat a passive school environment, teachers should provide ample support during the student's initial years by using appropriate language, playing simple, mind-stimulating games, and engaging them using all the senses. They must also provide emotional support, develop caring relationships with the children, and help them when they are exploring on their own or socially interacting with other children (Thompson, 2006). These simple acts become prerequisites to building cognitive development and benefit children's learning retention capacity. They also help regulate emotions, which is difficult in cases where the student loses focus, and their cognitive engagement with something new is derailed (Allen & Kelly, 2015).

A goal of recent times among several health systems has been to identify and diagnose autism promptly. The characteristics of later-diagnosed autistic children (Daniels & Mandell, 2014) are being used to identify potential risk factors in young children that can modify care and education practices. It proves the extent to which a late diagnosis can adversely affect a child (Mandy et al., 2022).

Neurodevelopmental issues, given how widespread they are in today's world, present a large burden on health, education, and economic systems, as the management of the problem is not linear (Cainelli & Bisiacchi, 2022). Although there has been, and continues to be, intensive research on disability, there is a lot yet to be discovered and worked upon.

4. Conclusion

Through this paper, the aim is to establish how early educational deprivation can lead to the timing and accuracy of diagnoses of neurodevelopmental conditions among students with disabilities. The main focus is on limited access to quality learning environments, strained home environments, teacher awareness, and delays in identification and intervention. All of these issues make it possible to overlook subtle signs of neurodevelopmental conditions in children, by labelling them as slow learners.

Delays in identification and intervention have adverse effects on the developmental trajectories of children. It's easy to write something off and attribute it to 'bad behaviour', but when children exhibit signs that their development is slower than a set of standard age and progress markers, the caregivers, whether that be the parents, family, or teachers, must take initiative to get them checked by a specialist for immediate identification. Early discovery of risk factors can ensure that children get the required treatment and live a smooth, fulfilling life ahead.

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