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Factors Associated With Delayed Recognition of Developmental Disorders Among Preschool Children

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Abstract

Delayed recognition of developmental disorders among preschool children represents a significant challenge in pediatric healthcare, potentially limiting access to timely assessment, early intervention, and appropriate educational support. Developmental disorders may affect language acquisition, social communication, cognitive functioning, motor coordination, adaptive behavior, and emotional regulation. Although developmental difficulties can become apparent during infancy and early childhood, many children remain unidentified until preschool or school entry. This narrative review examines the clinical, familial, socioeconomic, healthcare-related, and organizational factors associated with delayed recognition of developmental disorders among preschool children. Evidence from observational studies, systematic reviews, and developmental screening research indicates that delayed identification may be influenced by subtle developmental symptoms, limited parental awareness, insufficient standardized screening, inadequate professional responses to developmental concerns, socioeconomic inequalities, and barriers to specialist assessment. Children with less obvious difficulties may experience particularly prolonged diagnostic pathways, while geographic location, language differences, and unequal access to healthcare services can contribute to disparities. Early developmental surveillance, validated screening instruments, family-centered communication, and coordinated referral pathways are important strategies for improving identification. However, screening effectiveness depends on appropriate interpretation, timely follow-up, and access to diagnostic services. Strengthening developmental recognition practices through professional education, equitable healthcare access, and multidisciplinary collaboration may reduce diagnostic delays and improve developmental support during the preschool years.

Keywords: Developmental Disorders, Preschool Children, Delayed Diagnosis, Developmental Screening, Early Childhood Development, Autism Spectrum Disorder, Developmental Delay, Parental Awareness, Pediatric Healthcare, Early Intervention

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1. Introduction

Early childhood represents a period of rapid neurological, cognitive, language, social, emotional, and physical development. During the preschool years, children acquire fundamental abilities that support communication, learning, interpersonal relationships, independence, and participation in educational

activities. Developmental progress varies among children, but persistent difficulties in acquiring expected skills may indicate a developmental delay or an underlying neurodevelopmental disorder requiring professional evaluation. Developmental disorders encompass a broad range of conditions, including autism spectrum disorder, intellectual developmental disorder, communication disorders, motor coordination difficulties, and other conditions affecting developmental functioning. The manifestations of these conditions may vary considerably according to age, clinical severity, coexisting medical problems, and environmental influences. Some children demonstrate recognizable developmental differences during infancy, whereas others develop difficulties that become more apparent when social communication, language, and learning demands increase. Delayed recognition occurs when developmental concerns are not identified, investigated, or appropriately referred within a reasonable period after relevant difficulties become observable. Such delays may arise from limited parental awareness, inconsistent developmental surveillance, inadequate screening procedures, healthcare accessibility problems, or complex diagnostic pathways. Recognition should be distinguished from formal diagnosis because children may require developmental assessment and supportive services before a specific disorder is confirmed. Parents, preschool educators, pediatricians, nurses, psychologists, and other healthcare professionals all contribute to the identification of developmental difficulties. Parents observe children's behavior within family environments, while educators may identify differences in communication, learning, and social participation. Healthcare professionals are responsible for interpreting developmental concerns, conducting appropriate assessments, and arranging further evaluation when indicated.

This article critically evaluates factors associated with delayed recognition of developmental disorders among preschool children. It examines clinical presentation, parental awareness, socioeconomic circumstances, developmental screening, healthcare system barriers, and evidence-based strategies for improving early identification and access to developmental support.

Clinical Characteristics and Developmental Presentation Associated With Delayed Recognition

The clinical presentation of developmental disorders is an important factor influencing the age at which developmental difficulties are recognized. Neurodevelopmental conditions differ in symptom severity, developmental trajectory, and the extent to which they affect everyday functioning. Children with pronounced language impairment, significant cognitive difficulties, or obvious social communication differences may attract earlier attention from parents and healthcare professionals. In contrast, children with subtler developmental characteristics may remain unidentified until preschool or school environments introduce greater demands for communication, social participation, and independent functioning (Daniels & Mandell, 2014). Developmental differences may occur in one domain or involve several areas simultaneously. A child with substantial motor delay may demonstrate difficulties walking, climbing, or performing age-appropriate physical activities, whereas a child with language difficulties may have problems understanding instructions or producing meaningful speech. Other children may experience limitations in adaptive functioning, emotional regulation, or social interaction. When difficulties are relatively mild or compensated for within familiar environments, caregivers may not immediately recognize their clinical significance. Developmental surveillance should therefore assess multiple areas of functioning rather than relying exclusively on highly visible symptoms (Lipkin & Macias, 2020). Autism spectrum disorder illustrates how clinical presentation can influence diagnostic timing. A study involving 969 caregivers identified differences in the average age of diagnosis across diagnostic categories used at the time of investigation. Children with more clearly recognizable autistic characteristics were generally identified earlier than those with less obvious or differently classified presentations. The findings also demonstrated associations between diagnostic timing and demographic circumstances. Although historical diagnostic categories have since changed, the study remains relevant to understanding why less distinctive developmental presentations may contribute to delayed identification (Mandell et al., 2005). Research examining children and adolescents with autism has also identified relationships between diagnostic timing and cognitive or behavioral characteristics. In a study involving 1,716 participants, higher measured intellectual functioning and lower levels of observed autism symptoms

were associated with later initial diagnosis. These findings suggest that children who demonstrate relatively strong language or cognitive abilities may still experience significant developmental differences that require assessment. Healthcare professionals should therefore avoid assuming that adequate performance in one developmental domain excludes the possibility of difficulties in another (Mazurek et al., 2014). Developmental regression represents another important clinical consideration. Some children demonstrate a loss of previously acquired language, social, or motor abilities. Such changes may prompt earlier professional evaluation because they are more readily recognized as departures from previous functioning. Research conducted in the United Kingdom found that language delay, language regression, and greater support needs were associated with earlier autism diagnosis. These findings suggest that more conspicuous developmental characteristics may accelerate recognition, while children without these features may remain unidentified for longer periods (Brett et al., 2016). Coexisting developmental and behavioral difficulties may complicate recognition. Children may demonstrate attention difficulties, emotional dysregulation, hearing-related concerns, language impairment, or learning problems that overlap with characteristics of broader neurodevelopmental conditions. In some cases, the most visible difficulty becomes the focus of initial assessment while additional developmental needs remain insufficiently investigated. Comprehensive evaluation should therefore consider the child's overall developmental profile, including strengths, difficulties, medical history, and behavior across different environments (Daniels & Mandell, 2014). The age at which developmental expectations change can further influence recognition. During the early preschool years, differences in social communication, imaginative play, emotional regulation, and independence may become more noticeable as children interact with peers. A child who appeared to function adequately in a familiar home environment may experience greater difficulty in a structured classroom. Preschool observations can therefore provide valuable complementary information, particularly when parental or clinical concerns have not previously resulted in a comprehensive developmental evaluation (Lipkin & Macias, 2020). Clinical characteristics should ultimately be interpreted within a developmental framework that recognizes individual variation without dismissing persistent concerns. Children with subtle symptoms, relatively strong cognitive abilities, or uneven developmental profiles may require repeated assessment. Early recognition depends on evaluating patterns of functioning over time rather than waiting for severe impairment to become evident (Mazurek et al., 2014).

Parental Awareness, Family Perceptions, and Communication Barriers in Developmental Identification

Parents and caregivers play a central role in the recognition of developmental difficulties because they observe children's communication, behavior, learning, and functional abilities during everyday activities. Early concerns may involve delayed speech, limited social interaction, unusual play patterns, difficulties following instructions, or problems with movement and coordination. However, the ability to recognize potentially concerning differences is influenced by parental knowledge, previous childcare experience, family expectations, and access to reliable developmental information. Delayed recognition may occur when developmental difficulties are interpreted as temporary variations or when concerns are not communicated effectively to healthcare professionals (Glascoe, 1997).

Parental concerns can provide clinically valuable information when developmental problems are not immediately apparent during brief medical examinations. Research examining the relationship between parental observations and developmental screening demonstrated that caregivers' concerns were meaningfully associated with children's developmental performance. This suggests that parents should be regarded as important contributors to the assessment process rather than passive recipients of professional opinions. Structured discussion of parental concerns can improve opportunities to identify difficulties that might otherwise remain unnoticed (Glascoe et al., 1989).

The interpretation of developmental milestones varies across families. Some caregivers may compare a child's development with siblings or other relatives, while others may rely on cultural expectations regarding the age at which children should begin speaking, playing independently, or participating in social activities. These comparisons may occasionally delay professional consultation when

developmental differences are viewed as part of normal family variation. Conversely, parents who are familiar with developmental milestones may seek evaluation earlier. Healthcare professionals should provide clear, culturally appropriate information about developmental expectations without suggesting that all children must acquire skills at identical ages (Glascoe, 1997). Professional responses to parental concerns are another major determinant of timely developmental recognition. A study involving families of children with autism and intellectual or developmental disabilities found that caregivers of autistic children frequently recognized developmental concerns early but did not always receive proactive healthcare responses. Among children with autism, reassuring or passive professional responses were associated with longer diagnostic delays compared with responses involving appropriate developmental action. These findings indicate that parental awareness alone is insufficient when healthcare professionals do not investigate or follow up on reported concerns (Zuckerman et al., 2015). Communication difficulties may become particularly important when families and healthcare professionals do not share the same primary language. Parents may struggle to describe developmental observations accurately, understand screening questions, or interpret clinical recommendations. Such difficulties can lead to incomplete histories and misunderstandings about the need for further assessment. Language barriers may also complicate the interpretation of communication difficulties in children growing up in multilingual environments. Appropriate assessment should consider the languages used by the child and family, with qualified interpretation or culturally appropriate assessment resources when necessary (Gallegos et al., 2021). Family beliefs concerning developmental disorders may also influence help-seeking behavior. Some caregivers may fear social judgment, discrimination, or negative attitudes toward developmental disabilities. Others may be unfamiliar with available assessment and intervention services. These barriers can discourage families from discussing concerns or attending specialist appointments. Healthcare professionals should establish supportive communication environments that encourage questions and emphasize the importance of understanding children's individual developmental needs without assigning blame or stigma (Daniels & Mandell, 2014). Caregiver stress and practical responsibilities can affect the ability to pursue developmental assessment. Families managing employment demands, multiple children, transportation difficulties, or financial pressures may find it challenging to arrange repeated healthcare visits. Even when parents recognize developmental concerns, the process of obtaining referrals and attending specialist evaluations may require considerable time and resources. Accessible appointment systems, flexible communication methods, and clear referral instructions may help reduce these obstacles (Mandell et al., 2005). Effective parental engagement should therefore extend beyond distributing developmental information. Healthcare professionals should ask specific questions about communication, play, social interaction, learning, and adaptive behavior; document concerns accurately; and establish clear follow-up arrangements. Recognizing parents as essential partners in developmental surveillance can strengthen the identification process and facilitate earlier access to appropriate assessment and support (Zuckerman et al., 2015).

Socioeconomic Inequalities, Cultural Factors, and Healthcare Accessibility

Socioeconomic circumstances are important determinants of healthcare access and may influence the recognition of developmental disorders among preschool children. Families differ in their access to pediatric services, developmental specialists, health insurance, transportation, and educational resources. These differences can affect the age at which concerns are raised, screening is completed, diagnostic appointments are obtained, and intervention services are initiated. However, associations between socioeconomic characteristics and diagnostic timing are not uniform across studies or healthcare systems (Daniels & Mandell, 2014). Financial limitations may delay developmental assessment when families must pay for consultations, transportation, childcare, or specialist investigations. Children living in economically disadvantaged households may also experience difficulties accessing private developmental services when public facilities have long waiting lists. An investigation of autism diagnostic timing in Pennsylvania found that children living in rural communities received diagnoses later than urban children, while some lower-income groups experienced additional delays. These findings demonstrate the importance of examining how

economic conditions and geographical access interact with developmental healthcare pathways (Mandell et al., 2005). Healthcare insurance and service availability may also contribute to differences in recognition. A United States study involving 7,950 children examined developmental delay diagnoses and receipt of services during preschool and kindergarten. Children without health insurance, those from certain racial and ethnic minority groups, and children whose primary language was not English were less likely to have a recorded developmental delay diagnosis after accounting for measured developmental performance. The findings suggest that differences in identification cannot always be explained by underlying developmental ability alone (Gallegos et al., 2021). Racial and ethnic disparities have also been identified in autism recognition. A population-based investigation involving 2,568 children meeting autism surveillance criteria found that Black, Hispanic, and other minority children were less likely than White children to have documented autism diagnoses after adjustment for selected clinical and demographic factors. The findings highlight potential inequalities in the recognition process and suggest the need for improved professional awareness of diverse developmental presentations. Such disparities should be understood as characteristics of healthcare systems and social contexts rather than assumptions about individual families (Mandell et al., 2009). Cultural expectations regarding child behavior and development may influence how symptoms are interpreted. Differences in communication styles, family interactions, social expectations, and attitudes toward developmental assessment can shape the recognition process. Healthcare professionals should avoid relying on culturally narrow assumptions when evaluating social communication, language acquisition, or behavior. Culturally responsive assessment involves obtaining information about the child's environment, preferred language, family practices, and opportunities for developmental participation (Lipkin & Macias, 2020). Geographical location can further affect access to developmental services. Children residing in rural or remote areas may have limited access to developmental pediatricians, psychologists, speech-language professionals, and specialized diagnostic facilities. Families may be required to travel considerable distances or wait for visiting specialist services. Research reviewing autism diagnostic timing has identified geographical variation, suggesting that local healthcare infrastructure and service availability can influence whether children receive timely evaluation (Daniels & Mandell, 2014). Educational access may also affect identification because preschool teachers can recognize developmental differences during structured learning and social activities. However, children who do not attend early childhood education programs may have fewer opportunities for professional observation outside their families. Similarly, preschool institutions with limited developmental training or referral resources may struggle to distinguish persistent developmental difficulties from temporary behavioral variation. Coordination between educational and healthcare services may help ensure that concerns identified in either setting receive appropriate attention (Lipkin & Macias, 2020). Socioeconomic and cultural factors should be examined alongside clinical characteristics because diagnostic delays frequently arise from interacting influences rather than a single cause. Differences in screening access, professional responses, financial resources, and service availability can collectively shape developmental recognition. Strategies to reduce disparities should therefore address structural barriers while providing individualized, respectful care to children and their families (Gallegos et al., 2021).

Factors Associated With Delayed Recognition of Developmental Disorders Among Preschool Children

Associated factor	Potential reason for delayed recognition	Recommended improvement strategy
Subtle developmental symptoms	Difficulties may not be noticeable during routine interactions	Repeated developmental surveillance
Limited parental awareness	Developmental differences may be interpreted as temporary variation	Parent education and milestone guidance
Inadequate developmental screening	Early warning signs may remain unidentified	Routine use of validated screening tools

Passive response to parental concerns	Further assessment or referral may be postponed	Prompt evaluation and documented follow-up
Socioeconomic disadvantage	Financial and practical barriers to assessment	Affordable and accessible developmental services
Language and cultural barriers	Difficulty communicating concerns or completing assessments	Culturally responsive screening and interpretation
Rural or remote residence	Limited access to developmental specialists	Referral coordination and appropriate telehealth support
Fragmented referral pathways	Delays between screening and diagnostic evaluation	Coordinated tracking and referral management
Limited preschool observation	Developmental differences may remain unnoticed outside structured settings	Collaboration between educators and healthcare professionals
Unequal healthcare access	Differences in insurance coverage and service availability	Equity-focused developmental screening programs

Developmental Screening Practices and Healthcare Professional Factors Influencing Early Identification

Developmental screening plays a central role in identifying children who may require further evaluation for developmental disorders. Standardized screening instruments provide structured methods for assessing developmental abilities and identifying concerns that may not be apparent during routine clinical observation. These instruments can evaluate language, communication, motor functioning, problem-solving, social interaction, and adaptive behavior. However, screening is distinct from diagnosis because a concerning result indicates the need for further assessment rather than confirming the presence of a specific developmental disorder (Lipkin & Macias, 2020).

Inconsistent application of standardized screening tools can contribute to delayed developmental recognition. Historically, pediatric healthcare professionals have relied heavily on clinical observation and informal questioning during routine appointments. Although these methods provide useful information, they may fail to identify less obvious developmental difficulties. A national survey examining pediatric screening practices found that the reported use of standardized developmental screening tools increased between 2002 and 2009, reflecting progress in implementation. Nevertheless, the study demonstrated that screening practices varied among healthcare professionals and that opportunities remained for improving routine developmental assessment (Radecki et al., 2011). Professional knowledge and training can influence the recognition of developmental symptoms. Pediatricians, nurses, and other healthcare workers require an understanding of expected developmental milestones, early warning signs, and appropriate referral procedures. Limited familiarity with developmental screening instruments or insufficient experience assessing neurodevelopmental differences may contribute to missed concerns. Training programs should emphasize the interpretation of parental observations, recognition of developmental patterns, and appropriate use of validated assessment tools (Lipkin & Macias, 2020). Autism-specific screening provides an example of how structured assessment can support early recognition. The Modified Checklist for Autism in Toddlers, Revised with Follow-Up (M-CHAT-R/F), was developed to identify children who may benefit from further assessment for autism. Validation research demonstrated its usefulness as a screening instrument when administered and interpreted appropriately. However, screening tools have limitations, including false-positive and false-negative results, and should be integrated with developmental surveillance and professional judgment rather than used as isolated diagnostic instruments (Robins et al., 2014). The effectiveness of developmental screening also depends on the quality of implementation. Healthcare professionals must administer instruments according to established procedures, ensure that caregivers understand the questions, and interpret scores using appropriate criteria. Differences in language, cultural context, and parental familiarity with developmental terminology may influence responses. Clinicians should therefore consider the

child's broader developmental history and everyday functioning when interpreting results. A study evaluating autism screening within a large pediatric network found that screening performance varied across population groups, highlighting the importance of ongoing assessment of screening accuracy and equitable implementation (Guthrie et al., 2019). A significant problem occurs when concerning screening results do not lead to appropriate referrals. Research conducted across 54 pediatric practices examined autism-specific screening and subsequent clinical action. Although screening rates were relatively high, only 31% of children with concerning screening results were referred to specialists for additional evaluation. This finding demonstrates that screening coverage alone does not guarantee timely developmental identification. Referral procedures, communication with families, and follow-up arrangements are equally important components of effective developmental healthcare (Monteiro et al., 2019). Appointment duration and workload may also influence developmental surveillance. Pediatric consultations frequently involve immunizations, acute illnesses, growth monitoring, nutritional advice, and other healthcare responsibilities. Limited consultation time may reduce opportunities to discuss developmental concerns in detail. Healthcare organizations can address these challenges by incorporating standardized questionnaires before appointments, assigning appropriate responsibilities to nursing staff, and developing electronic systems that flag children requiring additional assessment (Lipkin & Macias, 2020). Professional responses to concerns should be proactive and supportive. When parents report persistent developmental difficulties, healthcare professionals should avoid dismissing concerns solely because the child appears comfortable or communicative during a brief consultation. Research has demonstrated that passive reassurance may be associated with longer diagnostic delays. Clear follow-up plans, documented developmental observations, and appropriate referrals can reduce the risk that concerns remain unresolved across multiple healthcare encounters (Zuckerman et al., 2015). Effective screening systems require continuous quality improvement. Healthcare organizations should monitor screening completion rates, positive screening results, referral initiation, attendance at specialist appointments, and the time between initial concern and developmental evaluation. These indicators can identify gaps in the recognition pathway and support targeted interventions. Improving screening quality therefore involves strengthening the entire process from initial observation to appropriate professional assessment and support (Monteiro et al., 2019).

Referral Pathways, Diagnostic Service Limitations, and Multidisciplinary Assessment

The availability and organization of developmental diagnostic services are important determinants of timely recognition among preschool children. Following identification of a developmental concern, children may require assessment by developmental pediatricians, psychologists, speech-language therapists, occupational therapists, audiologists, or other specialists. The specific professionals involved depend on the developmental domains affected and the child's clinical presentation. When referral pathways are unclear or specialist services are limited, children may experience prolonged intervals between initial concern and formal evaluation (Daniels & Mandell, 2014). Diagnostic delays can arise at multiple stages of the referral process. Healthcare professionals may postpone referral while observing whether developmental symptoms improve, families may experience difficulties scheduling appointments, and specialist services may have substantial waiting lists. Some children require repeated assessments because developmental characteristics become clearer over time or because different professionals evaluate separate areas of functioning. These circumstances demonstrate the need for coordinated diagnostic pathways that minimize unnecessary duplication while preserving comprehensive assessment (Mandell et al., 2005). Evidence from population-based research demonstrates that developmental recognition does not always occur promptly after concerns emerge. A systematic review and meta-analysis covering 56 studies across 40 countries reported a pooled mean age at autism diagnosis of approximately 60.5 months. In analyses restricted to studies involving children aged 10 years or younger, the mean diagnostic age was approximately 43.2 months. These findings illustrate the considerable variation in diagnostic timing and show that many children receive formal diagnoses during or beyond the preschool years. However, these estimates relate specifically to autism and should not be generalized to every developmental disorder (van 't Hof et al.,

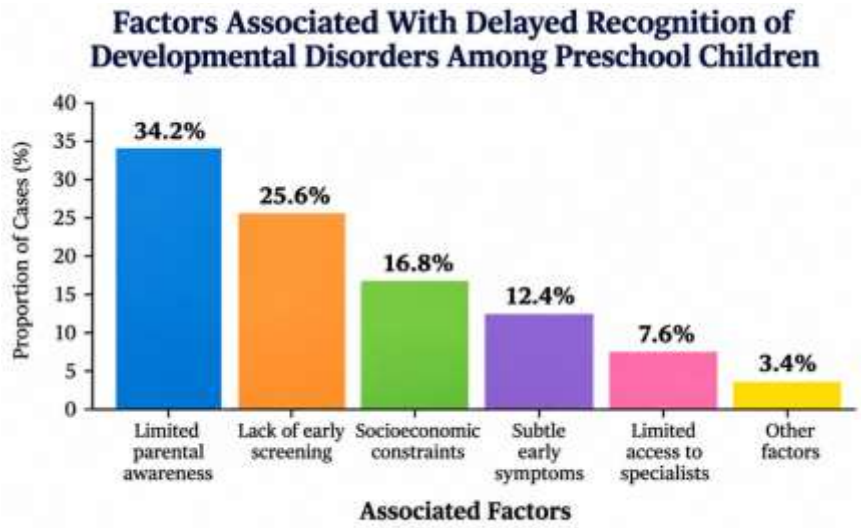
2021). The organization of healthcare systems may influence diagnostic waiting times. Regions with limited developmental specialists, inadequate referral coordination, or fragmented healthcare records may experience longer delays. Families may need to repeat developmental histories during multiple consultations, while professionals may lack access to previous screening results. Integrated referral systems could reduce these difficulties by ensuring that developmental concerns, previous assessments, and referral decisions are communicated effectively among professionals (Lipkin & Macias, 2020). Multidisciplinary assessment is particularly valuable when children demonstrate difficulties across several developmental domains. A child with communication delays may also experience hearing difficulties, cognitive impairment, or differences in social interaction. Evaluating only one area of functioning may fail to identify the broader developmental profile. Collaboration among pediatricians, psychologists, speech-language professionals, and early childhood educators can provide a more comprehensive understanding of individual strengths and support needs. Nevertheless, multidisciplinary assessment should be organized efficiently to avoid unnecessary repeated appointments (Daniels & Mandell, 2014). Preschool educators can contribute valuable observations because they interact with children in environments involving structured learning, peer relationships, group activities, and communication demands. Teachers may recognize persistent difficulties in following instructions, social participation, language comprehension, attention, or adaptive functioning. Appropriate communication between educational professionals and healthcare providers can help ensure that concerns identified in preschool settings receive consideration during developmental assessment. Parents should remain informed participants in this process, and information sharing should follow relevant privacy requirements (Lipkin & Macias, 2020). Family navigation support may help reduce delays associated with complex referral systems. Care coordinators or designated healthcare professionals can explain assessment procedures, assist with appointment scheduling, identify available services, and follow up when families encounter difficulties. Such support may be particularly valuable for caregivers facing language barriers, transportation challenges, or limited familiarity with developmental healthcare systems. Research on socioeconomic and racial disparities demonstrates the importance of addressing barriers that extend beyond the clinical characteristics of individual children (Gallegos et al., 2021). An important principle is that access to developmental support should not always depend on receiving a final diagnostic label. Children with identified language, motor, cognitive, or social developmental needs may benefit from appropriate educational and therapeutic services while diagnostic evaluation continues. Recommendations from pediatric professional organizations support referral to early intervention and relevant developmental services when concerns are identified, alongside further assessment where indicated. This approach can reduce unnecessary delays in support provision (Lipkin & Macias, 2020). Healthcare systems should evaluate referral performance using measurable indicators, including the time from first concern to screening, screening to referral, referral to specialist appointment, and initial assessment to appropriate intervention. These measures can help identify where delays occur and support the development of more efficient pathways. Improving diagnostic timeliness requires coordination among healthcare services, educational institutions, families, and community resources rather than relying exclusively on increased screening coverage (Monteiro et al., 2019).

Future Directions and Evidence-Based Strategies for Improving Early Developmental Recognition

Improving the early recognition of developmental disorders requires coordinated strategies involving healthcare professionals, families, educators, policymakers, and community organizations. Future initiatives should focus on strengthening developmental surveillance, improving access to standardized screening, reducing inequalities, and ensuring that children with identified concerns receive appropriate assessment and support. Because delayed recognition results from interacting clinical, social, and organizational factors, isolated interventions may be insufficient to address the entire problem (Lipkin & Macias, 2020). Routine developmental surveillance should remain a central component of pediatric healthcare. Professionals should ask caregivers about developmental progress

during regular visits and document relevant concerns regarding language, communication, social behavior, motor functioning, and adaptive skills. Standardized developmental screening should complement surveillance at recommended ages and whenever concerns emerge. The American Academy of Pediatrics recommends general developmental screening at 9, 18, and 30 months and autism-specific screening at 18 and 24 months. These intervals provide structured opportunities for early recognition, although continued surveillance remains necessary throughout the preschool period (Lipkin & Macias, 2020). Greater attention should be given to children whose developmental differences are subtle or inconsistent across environments. Children with relatively strong cognitive abilities may experience social communication or adaptive functioning difficulties that become apparent only under more demanding circumstances. Repeated observation and the integration of information from parents, preschool educators, and healthcare professionals can help identify concerns that are not evident during one consultation. Research examining age at autism diagnosis suggests that less pronounced symptoms may contribute to later identification, reinforcing the importance of comprehensive developmental assessment (Mazurek et al., 2014). Parental education should be strengthened through accessible and culturally appropriate communication. Families may benefit from clear information about developmental milestones, early warning signs, and the availability of assessment services. Educational materials should avoid creating unnecessary anxiety while emphasizing that persistent concerns warrant professional discussion. Healthcare professionals should encourage caregivers to describe their observations and should respond with appropriate assessment or follow-up rather than relying solely on reassurance. Evidence concerning parental concerns and professional responses demonstrates the importance of this communication process in diagnostic timeliness (Zuckerman et al., 2015). Developmental screening programs should also incorporate procedures for ensuring that concerning results lead to appropriate action. High screening rates have limited value when children do not receive referrals or when families cannot access specialist services. Electronic referral tracking, reminder systems, and care coordination may help identify incomplete assessment pathways. Healthcare organizations should evaluate whether children with positive screening results receive timely diagnostic evaluation and developmental support. The findings of primary care screening research demonstrate that referral completion is a critical component of early identification (Monteiro et al., 2019). Equity-focused interventions are necessary to reduce disparities in developmental recognition. Children from economically disadvantaged families, minority communities, rural regions, and households experiencing language barriers may face additional difficulties obtaining assessment. Healthcare organizations should consider multilingual resources, interpretation services, accessible screening programs, transportation support, and coordinated referrals to community services. Research examining developmental delay recognition has identified differences in diagnosis and service receipt across demographic groups, suggesting that efforts to improve identification must include structural barriers to healthcare access (Gallegos et al., 2021). Professional education should address variation in developmental presentation and the limitations of relying exclusively on obvious symptoms. Pediatricians, nurses, psychologists, preschool educators, and allied healthcare professionals require training in recognizing early communication difficulties, adaptive challenges, motor delays, and atypical developmental patterns. Education should also emphasize that children may demonstrate developmental strengths alongside clinically important difficulties. Research on autism recognition disparities highlights the importance of improving professional awareness of different symptom presentations across populations (Mandell et al., 2009). Digital health technologies may offer opportunities to support developmental surveillance and referral coordination. Electronic health records can incorporate developmental screening reminders, structured questionnaires, and documentation of parental concerns. Telehealth consultations may improve access to preliminary developmental advice for families living far from specialist centers. However, digital services should complement rather than automatically replace comprehensive assessment, particularly when direct observation, physical examination, or standardized developmental testing is required. Digital implementation must also account for unequal internet access and technological literacy (Lipkin & Macias, 2020). Future research should investigate

how developmental recognition differs across diagnostic categories rather than focusing exclusively on autism spectrum disorder. Although autism research provides substantial information about age at diagnosis, other developmental conditions may involve different recognition pathways and barriers. Longitudinal studies could examine language disorders, global developmental delay, intellectual developmental disorder, and motor coordination difficulties from early childhood through school entry. Such investigations would help identify whether clinical, familial, and healthcare system factors affect different developmental conditions in similar ways (Daniels & Mandell, 2014). Standardized research definitions are also important. Investigators should distinguish the age at first parental concern, first professional discussion, first positive screening, referral, specialist assessment, formal diagnosis, and initiation of support. These events may occur months or years apart, and using only the age at diagnosis can conceal where delays arise. Studies examining developmental identification should report these intervals separately and consider differences in access to clinical services, patient characteristics, and referral procedures (van 't Hof et al., 2021). The effectiveness of early identification initiatives should be evaluated through patient-centered and developmental outcomes rather than screening numbers alone. Relevant measures include reduced time to appropriate assessment, improved access to developmental services, caregiver satisfaction, functional progress, and continuity of educational support. Earlier recognition is valuable because it can improve opportunities for timely assistance, but outcomes also depend on the suitability, quality, and accessibility of services provided after identification (Lipkin & Macias, 2020). International collaboration may improve the development of culturally appropriate screening and assessment resources. Studies conducted in different countries have reported considerable variation in autism diagnostic timing and associated factors. These differences suggest that policies and interventions should be adapted to local healthcare arrangements rather than assuming that strategies effective in one setting will produce identical outcomes elsewhere. Multicenter research could help determine which components of developmental screening, family engagement, and referral management are transferable across healthcare systems (van 't Hof et al., 2021). Ultimately, improving early recognition requires an integrated approach that combines clinical vigilance, parental participation, validated screening, equitable service access, and coordinated professional assessment. Children should receive timely support based on their developmental needs, while healthcare systems work to reduce unnecessary delays between initial concerns and appropriate services. Sustained evaluation and quality improvement can help ensure that developmental recognition becomes more consistent, inclusive, and responsive to the needs of preschool children and their families (Lipkin & Macias, 2020).



Summary

Delayed recognition of developmental disorders among preschool children is influenced by multiple interacting clinical, familial, socioeconomic, and healthcare system factors. Subtle developmental symptoms, uneven developmental profiles, limited parental awareness, inadequate professional responses, and inconsistent screening practices may contribute to delayed identification. Geographic barriers, socioeconomic inequalities, cultural differences, and limited access to specialist services can further prolong the interval between initial concerns and appropriate developmental evaluation. Published research emphasizes the importance of recognizing parental observations, incorporating standardized developmental screening, and ensuring that concerning findings lead to appropriate referral and follow-up. However, screening alone is insufficient when diagnostic services are difficult to access or when professional communication is fragmented. Developmental recognition should be distinguished from formal diagnosis, and children with identified developmental needs should receive appropriate support while further assessment proceeds. Collaboration among parents, pediatricians, nurses, psychologists, therapists, and preschool educators can improve the collection and interpretation of developmental information. Future strategies should prioritize equitable healthcare access, culturally responsive assessment, professional education, efficient referral pathways, and continuous quality improvement. Strengthening these components may reduce delays in developmental recognition and support more timely, individualized care during the preschool years.

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