



“Developmental Delay Screening in Early Childhood: A Narrative Review of Nursing Roles and Evidence-Based Practices”

Linumol Joseph¹

¹Assistant Professor,

Department of Child Health Nursing,
Shri Bapuji College of Nursing, Ladnun,
Rajasthan, India.

¹Corresponding author email: linumadathettu@gmail.com

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Abstract: Early childhood is a critical period characterized by rapid physical, cognitive, language, social, and emotional development. Developmental delays occurring during this period can significantly affect a child's long-term health, educational attainment, and quality of life. Globally, millions of children experience developmental difficulties, yet a substantial proportion remain unidentified until school age, resulting in missed opportunities for early intervention. Developmental delay screening serves as a fundamental strategy for the early detection of developmental concerns and facilitates timely referral, assessment, and intervention. Nurses occupy a pivotal position in this process because of their frequent contact with children and families across primary care, community, school, and hospital settings. This narrative review examines the concept of developmental delay screening in early childhood, the burden and determinants of developmental delays, contemporary screening approaches, validated screening tools, and evidence-based practices supporting early identification. Particular emphasis is placed on nursing roles in developmental surveillance, screening implementation, family education, referral coordination, and interprofessional collaboration. Current evidence indicates that structured developmental screening integrated into routine child health services improves detection rates and enhances developmental outcomes. Despite advances in screening methodologies, challenges such as limited resources, inadequate professional training, cultural barriers, and inequitable access to services continue to hinder effective implementation. Strengthening nursing competencies, promoting family-centered care, and adopting standardized evidence-based screening protocols can significantly improve early childhood developmental outcomes. This review highlights the essential contribution of nurses in advancing developmental health and provides recommendations for practice, education, research, and policy.

Keywords: *Developmental delay, developmental screening, early childhood, nursing roles, developmental surveillance, early intervention, child health, evidence-based practice, pediatric nursing, developmental assessment.*

Introduction

Early childhood, generally defined as the period from birth to five years of age, represents a crucial phase of human growth and development. During this period, children acquire foundational skills in cognition, communication, motor functioning, social interaction, and emotional regulation. The developmental experiences that occur in these formative years significantly influence future educational achievement, social adaptation, mental health, and overall well-being. Consequently, ensuring optimal developmental progress

during early childhood is recognized as a global public health priority (World Health Organization [WHO], 2020).

Developmental delay refers to a significant lag in achieving age-appropriate developmental milestones in one or more domains, including gross motor, fine motor, language, cognitive, social, and adaptive functioning. Delays may be temporary, persistent, or indicative of underlying developmental disorders such as autism spectrum disorder, intellectual disability, cerebral palsy, or hearing impairment (Centers for Disease Control and Prevention [CDC], 2023). Research estimates that approximately 10–15% of children



experience developmental delays, although prevalence varies according to population characteristics, screening methods, and diagnostic criteria (Glascoe & Marks, 2011).

The consequences of unidentified developmental delays are substantial. Children who do not receive timely intervention are at increased risk of academic difficulties, behavioral challenges, poor social integration, and reduced economic productivity in adulthood. Conversely, evidence demonstrates that early identification and intervention can significantly improve developmental trajectories and reduce long-term disability (Shonkoff & Garner, 2012). Developmental screening therefore plays a vital role in identifying children who may require further evaluation and support.

Nurses are uniquely positioned to contribute to developmental screening efforts. Their extensive engagement with families during immunization visits, growth monitoring sessions, well-child examinations, school health programs, and community outreach initiatives provides valuable opportunities for developmental surveillance and screening. Contemporary pediatric and community health nursing practice increasingly emphasizes developmental promotion, family-centered care, and early intervention strategies. As healthcare systems worldwide prioritize preventive child health services, nursing involvement in developmental screening has become more significant than ever.

This narrative review explores the importance of developmental delay screening in early childhood and critically examines evidence-based nursing practices that support effective screening and intervention. The review synthesizes current literature regarding developmental delay prevalence, screening approaches, validated screening instruments, nursing responsibilities, implementation challenges, and future directions.

Understanding Developmental Delay in Early Childhood

Developmental delay encompasses a broad range of conditions characterized by slower-than-expected achievement of developmental milestones. Development is a multidimensional process involving physical growth, motor skills, cognitive abilities, language acquisition, social

competence, emotional regulation, and adaptive behaviors. A delay may affect a single developmental domain or multiple domains simultaneously. When delays occur across several areas, the condition is often referred to as global developmental delay.

The etiology of developmental delay is multifactorial and includes genetic, biological, environmental, and psychosocial influences. Prenatal factors such as maternal malnutrition, substance abuse, infections, and exposure to toxins can adversely affect fetal brain development. Perinatal complications including prematurity, low birth weight, birth asphyxia, and neonatal infections also contribute significantly to developmental risk. Postnatal influences such as chronic illness, malnutrition, environmental deprivation, poverty, inadequate stimulation, neglect, and exposure to violence further increase the likelihood of developmental challenges (Black et al., 2017).

The prevalence of developmental delay remains a major concern worldwide. The Lancet Early Childhood Development Series estimated that over 250 million children younger than five years living in low- and middle-income countries are at risk of not reaching their developmental potential due to poverty and stunting (Black et al., 2017). Increasing awareness of neurodevelopmental disorders has further highlighted the need for systematic developmental surveillance and screening programs.

Developmental delays often present subtly during infancy and toddlerhood. Parents may notice delayed speech, limited eye contact, poor social interaction, delayed walking, difficulties with feeding, or unusual behavioral patterns. However, many developmental concerns are not readily apparent without structured assessment. Therefore, healthcare professionals require systematic screening methods to identify children who may otherwise remain undetected until developmental deficits become more pronounced.

Importance of Developmental Delay Screening

Developmental screening is a brief, standardized process used to identify children who may be at risk for developmental problems and require further assessment. Screening differs from diagnostic evaluation because it does not establish a



definitive diagnosis but rather identifies children who may benefit from additional investigation.

The primary objective of developmental screening is early detection. Numerous studies have demonstrated that developmental outcomes improve significantly when interventions are initiated during the early years of life, a period characterized by high neuroplasticity. Neural circuits responsible for language, cognition, emotional regulation, and social interaction are particularly responsive to environmental influences during early childhood (Shonkoff & Garner, 2012). Consequently, early intervention services can optimize developmental gains and minimize long-term impairment.

Developmental screening also supports equitable healthcare delivery. Children from socioeconomically disadvantaged families often face increased developmental risks while simultaneously experiencing barriers to healthcare access. Universal screening helps reduce disparities by ensuring that developmental concerns are identified regardless of socioeconomic status, parental education, or cultural background.

Another significant benefit of developmental screening is enhanced parental awareness. Screening discussions provide opportunities for healthcare professionals to educate caregivers about developmental milestones, child development, and strategies to support learning and growth. Parents who understand developmental expectations are more likely to seek assistance when concerns arise and engage actively in intervention programs.

From a public health perspective, developmental screening contributes to improved population health outcomes. Early detection reduces the burden associated with special education needs, healthcare utilization, and social support services later in life. Therefore, developmental screening represents both a clinical and economic investment in child health.

Developmental Surveillance and Screening Approaches

Developmental surveillance is a continuous, flexible process involving the monitoring of developmental progress over time. It includes eliciting parental concerns, obtaining developmental histories, observing child behavior, identifying

risk factors, and maintaining developmental records. Surveillance occurs during routine healthcare encounters and serves as the foundation for developmental screening. Professional organizations such as the American Academy of Pediatrics recommend combining ongoing developmental surveillance with periodic standardized screening at specific ages. Screening is typically conducted at regular intervals during infancy and early childhood because developmental trajectories change rapidly during these years (Lipkin & Macias, 2020).

Universal screening involves assessing all children regardless of perceived risk. This approach is increasingly favored because reliance solely on clinical judgment may fail to identify many children with developmental concerns. Research indicates that healthcare providers often miss developmental delays when standardized screening tools are not utilized (Glascoe, 2005).

Targeted screening focuses on children with known risk factors such as prematurity, low birth weight, family history of developmental disorders, chronic illness, or environmental adversity. Although targeted approaches may be resource-efficient, they risk overlooking children without obvious risk indicators. Consequently, many healthcare systems advocate universal developmental screening supplemented by targeted assessments for high-risk populations.

Contemporary screening approaches increasingly emphasize family-centered care. Parents are regarded as valuable partners in developmental assessment because they observe their children across diverse environments and situations. Parent-completed questionnaires have therefore become important components of developmental screening programs.

Evidence-Based Developmental Screening Tools

The effectiveness of developmental screening depends largely on the use of valid, reliable, and culturally appropriate assessment instruments. Several evidence-based screening tools are widely utilized in pediatric practice.

The Ages and Stages Questionnaires (ASQ) is among the most extensively used developmental screening instruments worldwide. The ASQ evaluates communication, gross motor, fine motor, problem-solving, and personal-social domains

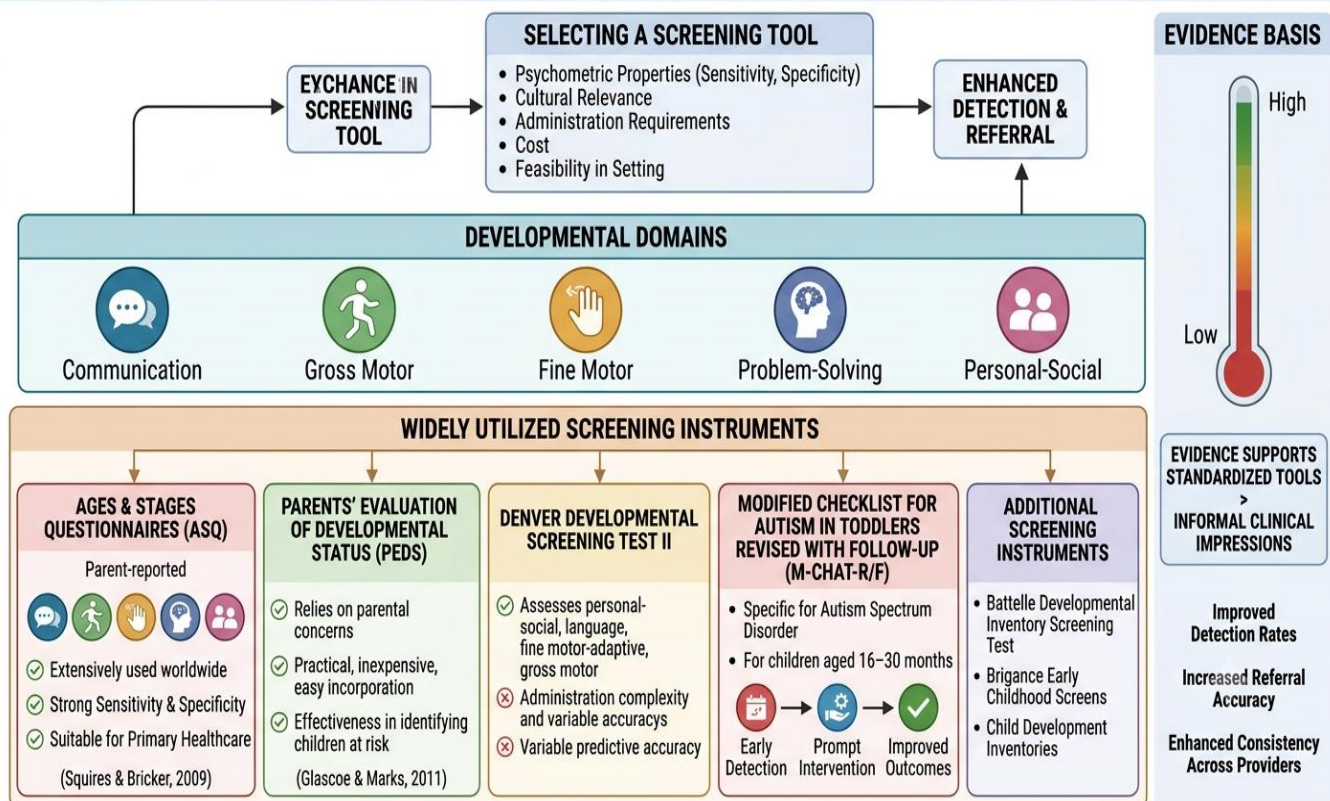


through parent-reported questionnaires. Studies have demonstrated strong sensitivity and specificity for detecting developmental concerns, making it suitable for primary healthcare settings (Squires & Bricker, 2009).

The Parents' Evaluation of Developmental Status (PEDS) is another widely recognized screening tool. It relies on parental

concerns regarding developmental and behavioral issues and has shown effectiveness in identifying children at risk for developmental difficulties. The tool is practical, inexpensive, and easily incorporated into routine healthcare visits (Glascoe & Marks, 2011).

SCHEMATIC OVERVIEW OF EVIDENCE-BASED DEVELOPMENTAL SCREENING TOOLS



The Denver Developmental Screening Test II assesses personal-social, language, fine motor-adaptive, and gross motor development. Although widely used internationally, concerns regarding administration complexity and variable predictive accuracy have led some healthcare systems to prefer newer screening instruments.

The Modified Checklist for Autism in Toddlers Revised with Follow-Up (M-CHAT-R/F) is specifically designed to identify early signs of autism spectrum disorder in children aged 16–

30 months. Early autism detection facilitates prompt intervention and improved developmental outcomes.

Additional screening instruments include the Battelle Developmental Inventory Screening Test, Brigance Early Childhood Screens, and Child Development Inventories. Selection of screening tools should consider psychometric properties, cultural relevance, administration requirements, cost, and feasibility within specific healthcare settings.

Evidence consistently supports the use of standardized screening tools over informal clinical impressions alone. Structured instruments improve detection rates, increase



referral accuracy, and enhance consistency across healthcare providers.

Nursing Roles in Developmental Delay Screening

Nurses play a central role in developmental delay screening because they frequently serve as the first point of contact between healthcare systems and families. Their responsibilities extend beyond screening administration to encompass developmental promotion, family support, referral coordination, and advocacy.

Developmental surveillance constitutes one of the most important nursing functions. During routine health visits, nurses assess developmental milestones, observe child behavior, gather parental concerns, and identify risk factors affecting development. These interactions enable nurses to detect subtle developmental issues that may otherwise remain unnoticed.

Nurses are also responsible for administering and interpreting developmental screening tools. Competent screening requires knowledge of child development, familiarity with screening instruments, and the ability to communicate findings effectively. Evidence suggests that nurses who receive specialized training demonstrate greater confidence and accuracy in developmental assessment (Council on Children with Disabilities et al., 2006).

Family education represents another critical nursing role. Parents often lack awareness regarding developmental milestones and warning signs of delay. Nurses provide anticipatory guidance regarding expected developmental achievements and educate caregivers about activities that promote healthy development. Such interventions strengthen parental engagement and support developmental stimulation within the home environment.

Referral and care coordination are essential components of nursing practice following identification of developmental concerns. Nurses facilitate timely referral to pediatricians, developmental specialists, speech-language pathologists, occupational therapists, physiotherapists, psychologists, and early intervention programs. Effective coordination ensures continuity of care and reduces delays in accessing services. Advocacy constitutes a broader nursing responsibility. Nurses advocate for universal developmental screening,

equitable healthcare access, early intervention services, and policies supporting child development. Through leadership roles in healthcare organizations and community programs, nurses contribute to system-level improvements in developmental health services.

Evidence-Based Nursing Practices Supporting Developmental Screening

Evidence-based nursing practice integrates the best available research evidence with clinical expertise and family preferences. In developmental screening, several evidence-based strategies have demonstrated effectiveness.

Routine implementation of standardized screening protocols is strongly supported by research. Healthcare settings that integrate validated screening tools into well-child visits achieve significantly higher developmental detection rates than those relying solely on clinical observation (Lipkin & Macias, 2020). Nurses contribute to successful implementation by ensuring consistent screening schedules and accurate documentation.

Family-centered communication is another evidence-based practice associated with improved outcomes. Parents are more likely to participate in screening and follow-up services when healthcare professionals engage them respectfully, acknowledge their concerns, and provide clear explanations regarding developmental findings. Nurses are uniquely positioned to foster trusting relationships that facilitate open communication.

Developmental promotion interventions also demonstrate substantial benefits. Programs involving parental coaching, responsive caregiving education, early literacy promotion, and developmental stimulation activities have been associated with improved cognitive, language, and socioemotional outcomes (WHO, 2020). Nurses frequently deliver these interventions within primary care and community health settings.

Interprofessional collaboration enhances screening effectiveness and continuity of care. Evidence indicates that coordinated multidisciplinary approaches improve referral completion, intervention access, and developmental outcomes. Nurses often function as care coordinators linking



families with healthcare providers, educators, therapists, and social services.

The use of electronic health records and digital screening platforms has emerged as an important evidence-based innovation. Electronic systems improve screening completion rates, facilitate data tracking, support clinical decision-making, and enhance communication among healthcare providers. Nurses increasingly utilize digital technologies to streamline developmental screening processes and monitor outcomes.

Challenges in Developmental Delay Screening

Despite growing recognition of developmental screening importance, numerous barriers impede effective implementation. One of the most frequently reported challenges is inadequate professional training. Many nurses and healthcare providers receive limited education regarding developmental assessment, resulting in reduced confidence and inconsistent screening practices.

Time constraints during clinical encounters also present significant obstacles. High patient volumes and competing healthcare priorities may limit opportunities for comprehensive developmental assessment. Consequently, screening may be overlooked or conducted inadequately.

Resource limitations further affect screening implementation, particularly in low-resource settings. Shortages of screening tools, trained personnel, referral services, and intervention programs restrict the effectiveness of developmental screening initiatives. Even when delays are identified, insufficient access to specialized services can undermine early intervention efforts.

Cultural and linguistic factors may influence developmental assessment accuracy. Developmental expectations vary across cultures, and screening instruments developed in one population may not perform equally well in another. Nurses must therefore consider cultural contexts and utilize culturally validated screening tools whenever possible.

Parental barriers such as limited awareness, stigma, fear of diagnosis, and socioeconomic constraints may also affect screening participation and follow-up compliance. Families may hesitate to acknowledge developmental concerns due to fear, denial, or misconceptions regarding child development.

Effective nursing communication and culturally sensitive education are essential for addressing these challenges.

Future Directions and Recommendations

Future developmental screening initiatives should prioritize integration within comprehensive early childhood health programs. Universal developmental screening should become a routine component of pediatric healthcare services across all settings. Standardized protocols can enhance consistency, improve detection rates, and reduce disparities in developmental outcomes.

Strengthening nursing education is essential for improving screening quality. Undergraduate and continuing professional development programs should emphasize developmental assessment, evidence-based screening tools, family-centered communication, and referral management. Simulation-based learning and competency assessments may further enhance nursing preparedness.

Technological innovations offer promising opportunities for advancing developmental screening. Mobile applications, telehealth platforms, artificial intelligence-assisted assessments, and electronic screening systems can improve accessibility, efficiency, and follow-up monitoring. Nurses should be actively involved in the development and implementation of these technologies.

Research focusing on culturally appropriate screening tools remains necessary. Many existing instruments were developed in high-income countries and may require adaptation for diverse populations. Future studies should evaluate screening effectiveness across different cultural and socioeconomic contexts.

Policy initiatives should support universal screening programs, workforce development, and equitable access to intervention services. Investment in early childhood development yields substantial long-term social and economic benefits, making developmental screening a cost-effective public health strategy.

Conclusion

Developmental delay screening represents a cornerstone of early childhood healthcare and plays a critical role in identifying children who may benefit from timely intervention. Given the profound impact of early developmental



experiences on lifelong health and well-being, early detection of developmental concerns is essential. Evidence consistently demonstrates that structured developmental screening using standardized tools improves identification rates and facilitates access to supportive services.

Nurses occupy a central position within developmental screening systems because of their frequent interactions with children and families across healthcare settings. Their responsibilities encompass developmental surveillance, screening administration, family education, referral coordination, developmental promotion, and advocacy. Evidence-based nursing practices—including routine standardized screening, family-centered communication, interprofessional collaboration, and developmental promotion interventions—contribute significantly to improved developmental outcomes.

Despite notable advances, challenges related to training, resources, cultural diversity, and healthcare access continue to affect screening implementation. Addressing these barriers requires coordinated efforts involving healthcare organizations, educational institutions, policymakers, and communities. Strengthening nursing capacity and integrating evidence-based developmental screening into routine child healthcare can enhance early identification, promote timely intervention, and support every child in achieving their full developmental potential.

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Conflict of Interest

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