GLOBAL BARRIERS AND ENABLERS TO EARLY CHILDHOOD DEVELOPMENTAL SURVEILLANCE AND INTERVENTION: A SCOPING REVIEW

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Abstract. Child development encompasses a range of physiological, cognitive, emotional, and social changes that children undergo from birth through adolescence. Early childhood is a critical period as rapid developmental changes take place, which can have lasting impacts on a child's health and well-being. This study focused on summarizing and evaluating child development monitoring tools and systems in several countries, including Malaysia, as well as their strengths, limitations, and target populations. Next, this study also focused on the barriers to the recognition of potential needs, access to diagnosis, and early intervention on developmental delay. A systematic literature search was conducted in PubMed, Scopus, and Google Scholar. The search included articles published from 1 January 2003 to 1 October 2023. Several examples of the differences in child developmental monitoring programme was shown from both high-and-low-income countries such as the United States and India, respectively. The factors for child developmental monitoring in terms of recognition, diagnosis, and early intervention were categorized into child, family, and service factors. As all child factors are non-modifiable, the importance of family and service factors must be emphasised. Early detection and intervention are paramount as they reduce the risk of developing future developmental disorders.
Keywords: *early intervention, child development, development delay, access to diagnosis*

Introduction

Childhood development is a dynamic process that involves both physical growth and biochemical, psychological, and other changes. The quickest time of growth occurs during early childhood, which is typically defined as the first five years of life (Phillips and Shonkoff, 2000). During this time, the growing brain is most receptive to input and care. Academic success in adolescence has been found to be negatively correlated with developmental delay in infancy (Anderson et al., 2003). The phrase "developmental disorder" or "developmental disabilities" describes a broad category of people who share physical or mental problems that significantly impede their ability to perform daily tasks (Duby et al., 2006; Petersen et al., 1998). Timely detection and early intervention are paramount as they reduce the risk of developing future developmental disorders. Early interventions can enhance children's developmental trajectories, ensuring they reach their full potential and reducing the risk of further complications or disabilities in the future. Nonetheless, developmental delay has myriad fields, and it is common that some of these areas are unnoticeable (First and Palfrey, 1994). One of the main issues of detecting child developmental delay is the wide normal variation of child development, which leads to detection failure, potentially overlooking can easily missing out on subtle details that can provide clues on developmental delays. The failure to detect developmental issues can result in a missed opportunity for early intervention. Hence, strategic and well-organized developmental surveillance and

periodic developmental screening tests will assist paediatricians and general practitioners in better identifying potential clinical issues.

Developmental monitoring is defined as the ongoing process of observing a childs development over time and noting if the child is meeting typical developmental milestones. It is a casual yet systematic tracking that can be done by parents, caregivers, or healthcare providers (AAP, 2022). The definition of developmental screening is a process designed to identify children who should receive more intensive assessment or diagnosis for potential developmental delays. It involves the administration of a brief, standardized tool aiding the identification of children at risk for developmental problems, ensuring timely referral for further evaluation and services (AAP, 2022). Using both surveillance methods was shown to improve early identification for children needing early intervention (Barger et al., 2018). Developmental screening is a vital part of detecting any developmental delays. Both developmental monitoring and screening are important components for early detection. Children who had routine screening were more likely to have delays identified, according to randomised controlled research (23% to 26% vs. 13% of children not routinely screened, p-value<0.001) (Guevara et al., 2013). Children with developmental delays are often found in primary care settings through three main channels: routine developmental surveillance or screening, parental concern, and concerns raised by third parties, such as nursery care providers or preschool instructors (Choo et al., 2019). Child development is a process of progression. Developmental delay was defined as when the child did not achieve specific skills in the expected time frame. It can be either specific, which means only one domain is affected, or global, which means more than one domain is affected. There is also the implication that the development occurred in a typical order or sequence and may be catch-up later. Developmental disability or disorder is defined as childhood mental or physical impairment or both, which results in substantial functional limitation in life activities.

Up-to-date estimated prevalence of developmental delay must be known so intervention can be targeted towards those with high risk, which can improve its effectiveness (Zablotsky et al., 2019). Direct comparisons of the prevalence of developmental delay are difficult as different countries have different diagnostic criteria, methods, and age measurements. For example, the World Health Organization (WHO) estimated that about 8.4% of children under the age of five years had some type of developmental delay in 2016 (Olusanya et al., 2018). In other countries, such as South Korea, the prevalence was about 2.5% for those under six years old in 2017 (Rah et al., 2020). In Malaysia, based on the National Health Morbidity Survey 2022, the prevalence of developmental delay among children aged 6 to 59 months old is 7.4 percent (IPH, 2022). Measuring the prevalence of undetected developmental delays can be challenging as they are not captured in data. The data may be greater in lower-income countries compared to higher-income countries because of the insufficient capacity of health support systems. Hence, the data on the prevalence, causes, and intervention, especially in lower-income countries, is lacking, hindering effective intervention and evidence-based policymaking. However, even in high-income countries, a large percentage of children with developmental delays are also under-reported. Based on the report by the Centers for Disease Control and Prevention in the United States of America, less than 1 in 5 parents of children with a developmental delay other than autism reported first concern before 18 months of age (Lipkin et al., 2020). One study measuring the prevalence of undetected developmental delays is still significant, especially in lower and middle countries. In Iran, the percentage of

undetected developmental delays in children in at least one of the domains is between 3.87% and 4.31% (Sajedi et al., 2014).

The phrase "early intervention" refers to a broad variety of supports intended to facilitate optimum child development. These supports may include general contact with support services and interventions aimed at improving the outcomes for children and/or families. Child development and adaptive skills may be improved by early detection of developmental disorders and early access to early intervention. Access to these services might also improve the quality of life for families raising children with developmental disorders. Early intervention can reduce the financial burden of expensive services later in life, which can help society economically (Ryberg, 2015). However, there is a mismatch where a large number of children who need intervention are unable to access them. For instance, fewer than half (45.7%) of a sample of 965 children in the United States with a variety of developmental problems received early intervention (McManus et al., 2014). Moreover, just 21% of parents in a UK study of over 1000 parents during or after the ASD diagnostic process received direct support, 38% were directed to resources for guidance or assistance, and 35% received no support (Crane et al., 2016). This review will first focus on the comparison of types of child development surveillance programmes between several chosen countries. Next, this report's main review is to analyse the barriers and factors to accessing early intervention for child developmental delay. This would offer stakeholders a consolidated source of current knowledge and practical recommendations, aiming to influence programs and policies to better serve the developmental needs of children worldwide.

Materials and Methods

A systematic literature search was conducted to identify relevant studies and articles. The following electronic databases were utilized: PubMed, Scopus, and Science Direct. The search included articles published from 1 January 2000 to 1 October 2023. Keywords used for the search included "child development" OR "developmental delays" OR "early intervention" AND Barriers OR "Factors" OR Challenges. Additionally, reference lists of key articles were hand-searched to identify any additional relevant sources. Articles and studies were included in this scoping review if they met the following criteria (*Figure 1*): (1) Focus on child development monitoring systems designed for early detection of developmental delays, (2) Address issues related to the barriers to recognition, diagnosis, and early intervention access, (3) Published in English, (4) Available in full text. Exclusion criteria included studies that were primarily reviews, commentaries, or not directly related to child development monitoring systems. Data were extracted from the included articles using a standardized data extraction form. The following information was collected: publication details, study objectives, study design, key findings, and any information related to the evaluation of child development monitoring systems (*Table 1*).

Table 1. *The selected articles for this scoping review.*

Title	Author	Year
A parent-focused early intervention program for autism: who gets access?	Birkin et al. (2008)	2008
African American Parents and Attitudes About Child Disability and Early Intervention Services.	Evans et al. (2016)	2016
Autism spectrum disorder screening and management practices among general pediatric providers	Dosreis et al. (2006)	2006
Autism Spectrum Disorder Screening Refusal Rates: Findings from a Statewide Early Intervention Program.	Matheis and Matson (2015)	2015

Autism and General Developmental Screening Practices Among Primary Care Providers	Mazurek et al. (2021)	2021
Better together: Developmental screening and monitoring best identify children who need early intervention	Barger et al. (2018)	2018
Caregiver experiences of developmental screening.	Traube rt al. (2021)	2021
Change in prevalence status for children with developmental delay in Taiwan: a nationwide population-based retrospective study.	Kuo et al. (2015)	2015
Child development surveillance: intervention study with nurses of the Family Health Strategy	Reichert et al. (2015)	2015
Child and family characteristics associated with age of diagnosis of an autism spectrum disorder in a tertiary care setting.	Bickel et al. (2015)	2015
Children with learning disabilities in the paediatric clinic, Hospital Tuanku Ja'afar Seremban: an overview.	Mariana and Wong (2011)	2011
Developmental delay: identification and management at the primary care level	Choo et al. (2019)	2019
Developmental Delay: When and How to Screen.	Vitrikas et al. (2017)	2017
Developmental disabilities among children younger than 5 years in 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016	Olusanya et al. (2018)	2018
Developmental screening.	Rydz et al. (2005)	2005
Developmental surveillance of infants and young children in pediatric primary care	King and Glascoe (2003)	2003
Diagnosing autistic spectrum disorder in the age of austerity.	Karim et al. (2014)	2014
Early Diagnosis of Autism Spectrum Disorder: What the Pediatricians Should Know	Singhi and Malhi (2023)	2023
Enablers and Barriers to Identifying Children at Risk of Developmental Delay: A Pilot Study of Australian Maternal and Child Health Services	Sheeran et al. (2021)	2021
Evaluation of Community Programs for Early Childhood Development: Parental Perspectives and Recommendations.	Partain et al. (2019)	2019
Evaluation of the rashtriya bal swasthya karyakram (RBSK): A national children's healthcare program in a health district of West Bengal, India	Chakraborty et al. (2022)	2022
Expanding Access to Clinical Services for Toddlers with Autism Spectrum Disorders.	Mathews et al. (2018)	2018
Explaining and selecting treatments for autism: parental explanatory models in Taiwan.	Shyu et al. (2010)	2010
Factors associated with parental stress and satisfaction during the process of diagnosis of children with autism spectrum disorders.	Moh and Magiati (2012)	2012
Factors associated with early intervention referral and evaluation: a mixed methods analysis.	Jimenez et al. (2014)	2014
Factors related to early intervention Part C enrollment: A systematic review.	Twardzik et al. (2021)	2017
Gestational Age at Birth and Risk of Developmental Delay: The Upstate KIDS Study	Hochstedler et al. (2021)	2021
Health professional perceptions regarding screening tools for developmental surveillance for children in a multicultural part of Sydney, Australia.	Garg et al. (2018)	2018
How to measure barriers in accessing mental healthcare? Psychometric evaluation of a screening tool in parents of children with intellectual and developmental disabilities.	Xiong et al. (2022)	2022
Identifying infants and young children with developmental disorders in the medical home: An algorithm for developmental surveillance and screening.	Duby et al. (2006)	2006
Implementing developmental screening and referrals: lessons learned from a national project.	King et al. (2010)	2010
Improving Access to Early Childhood Developmental Surveillance for Children from Culturally and Linguistically Diverse (CALD) Background	Edwards et al. (2020)	2020
Knowledge and Awareness Among Mothers Regarding Early Childhood Development: A Study from the United Arab Emirates	Sajedi et al. (2014)	2023
Monitoring tools for early identification of children with developmental delay in India: an update.	Shekhawat et al. (2022)	2022
Parental concerns based general developmental screening tool and autism risk: the Taiwan National Birth cohort study.	Lung et al. (2010)	2010
Parental concerns, provider response, and timeliness of autism spectrum disorder diagnosis.	Zuckerman et al. (2015)	2015
Parental Knowledge of Children's Developmental Milestones in Riyadh, Saudi Arabia.	Aldayel et al. (2020)	2020
Parental Perceptions Influencing the Utilization of Early Intervention Services in Children with Developmental Delay.	Chauhan et al. (2017)	2017
Parent-Reported Use of Interventions by Toddlers and Preschoolers With Autism Spectrum Disorder.	Payakachat et al. (2018)	2018
PEDS and ASQ developmental screening tests may not identify the same children	Sices et al. (2009)	2009
Prevalence and Incidence of Developmental Disorders in Korea: A	Rah et al. (2020)	2020

Nationwide Population-Based Study		
Prevalence and Variation of Developmental Screening and Surveillance in Early Childhood	Hirai et al. (2018)	2018
Promoting Optimal Development: Screening for Behavioral and Emotional Problems	Weitzman et al. (2015)	2015
Screening for developmental delays among young children--National Survey of Children's Health, United States, 2007	Rice et al. (2014)	2014
Screening for developmental delay: reliable, easy-to-use tools.	Rydz et al. (2006)	2006
Screening for parent and child ADHD in urban pediatric primary care: pilot implementation and stakeholder perspective	Lui et al. (2023)	2023
Screening for speech and language delay in preschool children: systematic evidence review for the US Preventive Services Task Force.	Nelson et al. (2006)	2006
Services and supports for young children with Down syndrome: parent and provider perspectives.	Marshall et al. (2015)	2015
The association of autism diagnosis with socioeconomic status.	Thomas et al. (2012)	2012
Treatments for autism: parental choices and perceptions of change.	Bowker et al. (2011)	2011
Trends in Pediatricians' Developmental Screening: 2002-2016.	Lipkin et al. (2020)	2020
Understanding and awareness of autism among Somali parents living in the United Kingdom.	Hussein et al. (2019)	2019
We Had to Keep Pushing": Caregivers' Perspectives on Autism Screening and Referral Practices of Black Children in Primary Care	Dababnah et al. (2018)	2018

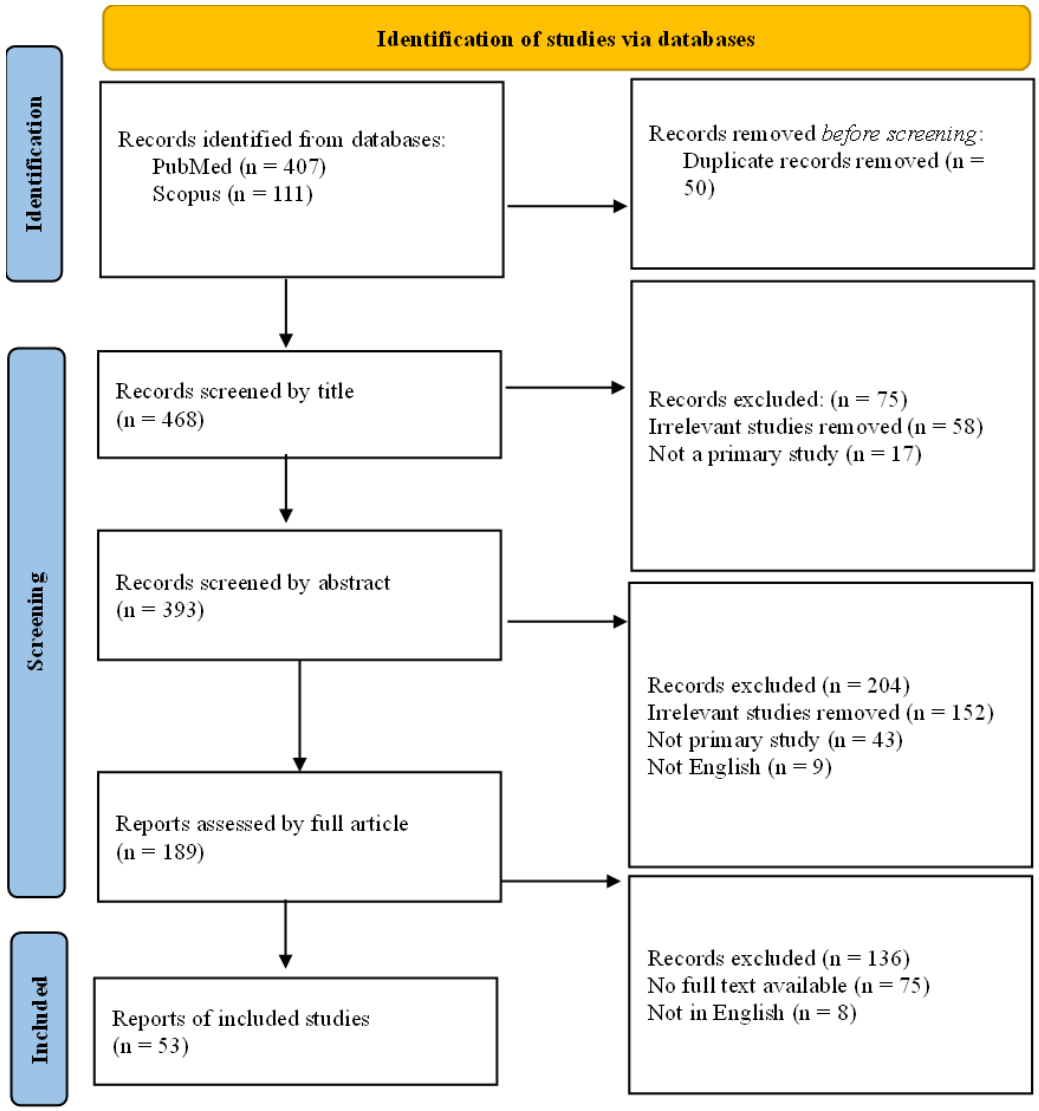

Figure 1. *Flow diagram of article selection for this scoping review.*

Results and Discussion

United State of America

In the USA, early intervention and identification are mandated through the Individuals with Disabilities Education Improvement Act. The availability of free developmental screening services can vary depending on several factors, such as the state, insurance coverage, and the healthcare provider. Nonetheless, developmental screening falls under provisions of the Affordable Care Act (ACA), which includes developmental screening for children at specific ages and should be covered by most health insurance plans without a copayment or co-insurance (The Domestic Policy Council, 2015). The child developmental monitoring and screening programme is a community-based collaborative system approach where intervention will be provided through a medical home, including primary care services such as acute illness management, chronic condition as well as preventative care (Duby et al., 2006). The standard developmental screening was released by the American Academy of Paediatrics (AAP) in 2006, using a standard screening tool at 9, 18, 24 and 30 months of age and screening at every visit. Children with suspected developmental delays will be referred to their respective specialists.

Taiwan

In Taiwan, children will be screened under the Protection of Children and Youths Welfare and Rights Act. All developmental monitoring and screening, hearing screening, and neonatal metabolic screening are among the preventative health treatments offered to children in Taiwan without any cost (Lung et al., 2010). The main range of the duties is to provide transdisciplinary assessments, screen children at risk, diagnose children with developmental delays and provide early intervention. Developmental surveillance was conducted at ages 2-3 years and 4-6 years, and all clinicians are mandated to report the findings. As an incentive, 80 Taiwanese dollars were given for each report if a child was diagnosed with developmental delay. TWD 800 was then given as encouragement for screening efforts (Kuo et al., 2015).

India

In India, the cost of developmental monitoring and screening varies depending on the state, government hospitals, and public or private clinics. The local developmental screening tool was first introduced in 1991 which was the Baroda Developmental Screening Test (BDST). This was followed by the Developmental Assessment Scale for Indian Infants (DASII) Trivandrum Development Screening Chart (TDSC). Other states have either adopted these questionnaires or other available questionnaires from other developed countries (Shekhawat et al., 2022). In terms of child development monitoring programmes, the Indian government has introduced Rashtriya Bal Swasthya Karyakram programmes to screen children from birth to 18 years old for 4 'D's: Defects at birth, Deficiencies, Diseases, Developmental delays including disabilities. Children are screened by mobile health teams, and those identified with signs of developmental delays are referred to higher centres for further assessment and intervention. Intervention services provided depend on each state where certain states have different coverage levels and subsidies (Sharma et al., 2022).

Malaysia

In Malaysia, child development surveillance was fully subsidized. The Ministry of Health's Family Health Development Division has made steps to increase the identification of children with disabilities. The revision was done in the 0 to 18 Child Health Programme from 2005 to 2006, and then a pilot programme was introduced in 2008 to improve children's developmental surveillance. The main revision includes the specific developmental milestone screening at 5 months, 12 months, 18 months, and 4 years. For newborns, hearing screening was done on those with high risk only. This revision also includes a formal anticipatory guidance component and strongly encourages healthcare staff to note parental concerns regarding their childs development (Hss, 2008). The M-Chat autism screening was also included and will be done at 18 and 36 months. If any concerns arise during these appointments, the child will be referred to the doctor for further evaluation. The government hospitals and clinics also provide services for early intervention of children with developmental delay issues. Nonetheless, there were issues with the lack of frequency of appointments due to manpower issues; hence, children who could access private healthcare had more appointments, leading to better outcomes (Ismail et al., 2019).

Factors in child development recognition of possible need, access to diagnosis and early intervention

Access to early intervention was a process that can be summarised into 3 components (*Figure 2*): (1) Identifying the possible need is the ability to recognize the need to support the childs development. This was usually made from an effective system of child development monitoring and surveillance. A parent, another family member, a member of the family's network, a professional working with the family, or mechanisms for widespread monitoring can all be part of who made the initial recognition. (2) The second part of the pathway is the diagnosis, where the child with developmental concerns undergoes specific screening or assessment. This process leads to the identification of diagnosis for specific development delay problems. (3) The last part is the early intervention, where the healthcare services provide support for formally diagnosing any developmental issues in the child. The process of gaining access to early intervention may be influenced by a number of variables, and these factors may function differently during each of the three phases.

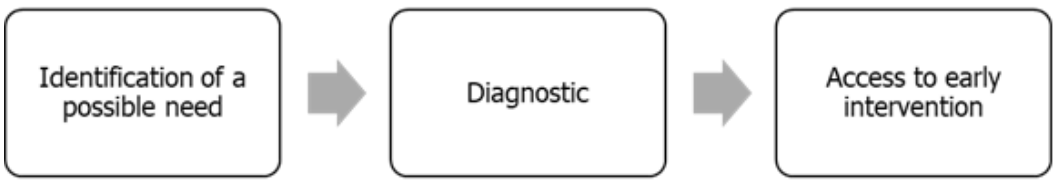

Figure 2. *Pathway to access early intervention.*

Based on the three pathways to access early intervention, there are also three factors for each component of the pathway, which are summarised in *Table 2*.

Table 2*. Factors in child development screening of possible need, access to diagnosis and early intervention.*

Factors	Identification of a possible need	Diagnostic	Access to early intervention
Child	Gestational birth	Child disability severity	Child disability severity
	Child disability severity	-	-
	Childbirth order	-	-
Family	Education	Education	Education
	Socio-economic	Socio-economic	Socio-economic
	Socio-cultural	Socio-cultural	Socio-cultural
	Knowledge	Knowledge	Knowledge
	Family history of developmental disabilities	Family history of developmental disabilities	Family history of developmental disabilities
	-	Parental belief	Parental belief and perception
	-	Parental awareness of services	Parental awareness of services
	-	-	Parental stress and readiness to take action
	-	-	Father vs mother role
Services	Healthcare provider expertise and confidence	Healthcare provider expertise and confidence	Healthcare provider expertise and confidence
	Limited time	Limited time	Limited time
	Health service workforce and logistic issues	Health service workforce and logistic issues	Health service workforce and logistic issues
	Financial support	Financial support	Financial support
	-	Proactiveness of healthcare provider	Proactiveness of healthcare provider
	-	Current referral system	Current referral system
	-	The method used to screen	The method used to screen
	-	-	Communication
	-	-	Diagnostic label
	-	-	Eligibility criteria

Child factor

Identification of a possible need

Child factor, for the most part, is a non-modifiable factor. Babies born pre-term were significantly associated with a higher risk for developmental delay compared to born term. One study suggested that those born pre-term are associated with better early detection, possibly due to higher parental concern and more comprehensive follow-up by healthcare providers (Hochstedler et al., 2021). It was also noted that being first-born was a barrier towards early recognition of developmental problems compared to later birth order (Bickel et al., 2015). In terms of child disability severity, there were mixed findings. One study suggested that having other developmental disability, such as Down Syndrome or cerebral palsy, will lead to parents being less inclined to have screening for other developmental issues, such as autism (Matheis and Matson, 2015). In another study, it was found that parents' concern about younger age was more prominent in children with both autism and intellectual disabilities compared to either one of them only (Zuckerman et al., 2015).

Diagnosis

In terms of early diagnosis for autism, those with less severe are noted to have longer diagnostic periods. In the United States, children with Asperger syndrome are associated with a longer delay of diagnosis compared to those with other autism spectrum disorder labels such as Rett syndrome, autism, or autistic traits (Jimenez et al., 2014). This was noted especially for those children who need more than one domain of developmental delay. Those diagnosed with both autism and other developmental delays tend to receive earlier diagnoses compared to those who have autism only disability (Zuckerman et al., 2015).

Early intervention

Similar to two previous factors, the nature and severity of disability influence the access to early intervention. It was found that children with less severe disability received lesser intervention compared to those with moderate-to-severe disabilities (Payakachat et al., 2018). Similar findings were noted among those with Asperger syndrome, as they have difficulties accessing diagnostic support, and they also have more difficulties accessing early intervention (Birkin et al., 2008).

Family factor

Identification of a possible need

Parental factors play an important role in early developmental monitoring detection. It was noted that parents with higher socio-economic status and education levels are associated with better child developmental recognition and are able to suspect early signs of autism (Moh and Magiati, 2012). Several factors are associated with better surveillance and screening, such as higher income, higher household education, child health status, family structure, and involvement in medical home programmes (Hirai et al., 2018). Another issue is children from different cultures and diverse languages who are not proficient in the major language of the country. In Australia, this type of barrier leads to 1.5 likely for them to have more developmental vulnerabilities across the spectrum of concerns (Edwards et al., 2020). These children also face additional challenges to early identification and intervention due to cultural beliefs, low health literacy, and different characteristics of the early childhood service system (Edwards et al., 2020). Knowledge was important as it allowed parents to recognize the childs developmental milestones, which was a vital component in developmental monitoring programmes. In Saudi Arabia, only 52.3% answered correctly on physical development, whereas only 21% of parents answered correctly on cognitive, social, and emotional development (Aldayel et al., 2020). Similar findings were shown in the United Arab Emirates, where knowledge of development milestones remains unsatisfactory (Saleh et al., 2023). Having a family member with any developmental issues or disabilities is associated with early recognition of possible needs for intervention. In terms of autism, those who have family members with autism are more than twice as likely to be detected by parents and brought for routine autism screening (Matheis and Matson, 2015).

Diagnosis

Similar to early recognition, socio-economic factors play a crucial role in terms of having access to diagnosis (Thomas et al., 2012). This is mainly due to the financial ability to access healthcare services, which was shown in certain states in the United States of America, where access to diagnosis was significantly increased once the healthcare system was subsidized or almost free (Jimenez et al., 2014). This was also similar in the United Kingdom, where the universal healthcare system allowed parents to have better access to early diagnosis for any developmental problems, especially autism. Also, in this study, it was also noted that those parents who have access to private healthcare services have less delay in receiving autism diagnosis compared to public healthcare (Brett et al., 2016). Parental awareness of the services provided was

also a major barrier to early diagnosis. The access to early diagnosis was noted to be worsened, particularly for parents facing time constraints in bringing their children to healthcare services (Jimenez et al., 2014).

Ethnic minority groups are also associated with more barriers to diagnostic access to developmental problems. In the United States, among those with delayed diagnosis, African American was noted to be over-represented, especially those from lower-income communities (Thomas et al., 2012). Another study also showed that being part of a certain ethnic minority, especially African American, is a strong barrier to early access to developmental problem diagnosis (Dababnah et al., 2018). Some parents also have a negative perception towards the diagnostic label of developmental delays, which leads to a negative stigma. Some African American parents fear that the label of ADHD on their child will lead to systemic racism and over-policing of the minority community (Lui et al., 2023). Certain cultural or parental beliefs were a major barrier to early diagnosis access. Certain cultures were associated with the belief that developmental disabilities were caused by parenting style. In other cultures, some even believe that it is caused by punishment for the previous behaviour of the family members (Birkin et al., 2008). Parental beliefs regarding developmental disabilities are shaped partially by culture or religion. This was recorded in various cultures around the world, such as Maori, Pacific Islander, Somali or Taiwanese (Hussein et al., 2019; Shyu et al., 2010; Birkin et al., 2008).

Early intervention

Similar to both early recognition and diagnosis, socio-economic status was significantly associated with early access to intervention (Payakachat et al., 2018; Jimenez et al., 2014). In one study in Malaysia, it was noted that 335 patients out of 1320 were found to have learning disorders, which were mostly due to developmental delays. Unfortunately, about 11.3% defaulted and did not attend the following intervention programmes due to financial and transportation issues (Mariana and Wong, 2011). Another study found that about 85.8% of parents had financial concerns about caring for and providing early intervention access for their children (Xiong et al., 2022). The situation was noted to worsen as a significant number of parents were affected economically as they need to reduce their working hours to access early intervention (Marshall et al., 2015). Being a minority is also a major barrier to access to early intervention. Being white ethnicity in the United States was found to be more than twice as likely to receive early intervention compared to African Americans (Thomas et al., 2012). Those parents with language barriers were also found to have difficulties in accessing early intervention (Marshall et al., 2015). Parental beliefs and culture also play a major factor in early intervention. In Taiwan, the belief in parents attribution leads to the delay of early intervention of a child with a confirmed diagnosis of autism (Shyu et al., 2010). In Nepal, one study found that certain parents tend to seek traditional treatment rather than early intervention, such as massage or traditional herbs (Chauhan et al., 2017). Among Somali communities, there was also a strong belief that both early intervention and religious services have similar importance in helping the child (Hussein et al., 2019).

In terms of parental confidence and readiness, mixed findings were found; in Bangladesh, those parents with low confidence in caring for their children were more likely to be involved in early intervention, whereas in New Zealand, low readiness is a major barrier in early intervention (Birkin et al., 2008). Being a father instead of a

mother is a major barrier to early intervention. This was based on the perception of parental roles and societal expectations (Ridding and Williams, 2019). In terms of early intervention access in the United Kingdom, it was viewed as more mother-orientated, which led to barriers for fathers of children with Down Syndrome (Ridding and Williams, 2019). Another study in the United States found that fathers feel more uncomfortable in communicating with healthcare professionals and tend to transfer the care towards the mother (Evans et al., 2016). Time constraints among parents were a major barrier to early intervention, especially in terms of adjusting work schedules and household duties (Evans et al., 2016). Limited parental awareness towards the systems and early intervention services was also associated with delay in early intervention (Birkin et al., 2008).

Service factor

Identification of a possible need

A child monitoring system is an important process of observing a childs development over time and noting if the child is meeting typical developmental milestones. Nonetheless, one study in the United States shows that only 52% of the parents were informally asked by healthcare providers about the development of their child, and only 21% filled out a questionnaire (Rice et al., 2014). This is partly explained by the inability of healthcare providers to use screening tools efficiently. Another study also showed that only 30.4% reported by their parents of guardian to have received parent-completed developmental screening, whereas only 37.1% were reported to have received developmental surveillance. The professional expertise in using screening tools and familiarity with the child monitoring and screening system significantly improved the rate of detection of possible needs (Dosreis et al., 2006). Other recent studies have shown only 64% and 62% usage of autism screening tools among healthcare providers in the United States; one of the main reasons was the unfamiliarity and lack of confidence with the screening tools (Mazurek et al., 2021). Other surveys in the USA show that about 82% of primary care physicians cited that time as their major barrier to screening children appropriately (Rydz et al., 2005). Apart from that, other barriers include competing clinical demands, lengthy wait times for kids to see subspecialists, a shortage of subspecialists available for referrals, staffing needs, disagreements over the most effective screening methods, and a lack of trust among doctors regarding their education and capacity to effectively handle behavioural and emotional problems in kids (Garg et al., 2018; Weitzman et al., 2015; Carroll et al., 2014; Dosreis et al., 2006; Nelson et al., 2006; Rydz et al., 2006; King and Glascoe, 2003).

In India, despite the introduction of Rashtriya Bal Swasthya Karyakram to detect developmental delays, there are many limitations within this programme. For instance, in terms of logistics, there was an obvious lack of healthcare workers, equipment and tools to perform the screening procedures. Important examinations, such as anthropometric measurements, were also missed. The intervention rate was also very low due to insufficient financial support (Chakraborty et al., 2022). Apart from physicians, nurses also play an important role in monitoring child development. In Brazil, only about 73.3% of primary healthcare nurses asked the mother's opinion about child development, and only 80% evaluated the child's development (Reichert et al., 2015). In Australia, one study has shown that only 15 out of 19 nurses did not have accurate knowledge to use PEDS tools for child developmental screening. Regarding

child developmental screening, most nurses complain about time constraints and excessive waiting time for referrals (Sheeran et al., 2021).

Diagnosis

Several arguments were raised for not applying the tools such as inadequate reimbursement, time limitations, and lack of treatment options for positive findings (Lipkin et al., 2020). Another study also mentioned that the method and tools used by the healthcare providers were found to have significant discordance between the outcomes (Sices et al., 2009). One study was done to evaluate the outcome of both autism screening tools (ASQ and PEDS). It was found that about 33% failed either one of the tests in the same children, thus showing potential false negatives from these tests (Sices et al., 2009). Another issue was the poor communication between parents and healthcare providers. This led to unsatisfactory services by parents, as one study shown that parents were generally satisfied with the screening process, but most parents complained that the healthcare provider provided minimal explanation of the diagnosis (Traube et al., 2021). Additional issues among healthcare providers were those with proactive responses, which will facilitate identification as they will send the referrals directly to the tertiary centre. However, those providers who placed the responsibility on the parents will lead to a delay in diagnosis (Zuckerman et al., 2015; Jimenez et al., 2014). Moreover, parents with autism tend to receive passive or reassuring responses from healthcare providers, which leads them to receive longer diagnostic delays (Zuckerman et al., 2015).

Different countries also have different systems of referrals for diagnosis of developmental delays. Those healthcare systems with long and complex systems of referrals tend to have longer diagnostic delays (Jimenez et al., 2014). The usage of specific screening tools can aid healthcare providers in identifying autism, but this was not used regularly (Garg et al., 2018). Some healthcare providers are also noted to feel uncomfortable in diagnosing autism, especially primary care providers, which leads to delays in referral to a specialist for diagnosis (Singhi and Malhi, 2023). Financial support will increase the capacity and availability of services to identify developmental delays. A study in the United Kingdom showed that the government funding cuts had increased the barriers towards autism diagnosis. The funding cut has been shown to increase the appointment duration and reduce the capacity of psychiatrists in several healthcare services (Karim et al., 2014). On the opposite, the increase in local and federal funding in the United States has facilitated the diagnosis of autism (Mathews et al., 2018).

Access to early intervention

Other than that, communication between parents and healthcare providers is also crucial in increasing parents' trust and acceptance of early intervention. Regarding child developmental monitoring and screening, most parents perceived improved communication as paramount in increasing resource utilization for early child intervention. Apart from that, transparency and translation to other languages were also vital in improving parents' involvement and increasing early child intervention (Partain et al., 2019). The label of specific diseases also facilitates access to early intervention. In Canada, it was shown that those who were diagnosed with Asperger Syndrome tended to be less involved in early intervention compared to other autism-related labels

(Bowker et al., 2011). Similar to access to diagnosis, the referral system also facilitates early intervention. Those referrals made by the healthcare provider allowed patients to have earlier intervention compared to the system in which parents need to do the referrals by themselves (Jimenez et al., 2014). Apart from that, those systems with very strict eligibility criteria were also shown to be a major barrier to early intervention. In the United States, those states with stricter eligibility criteria tend to have lower early intervention participation than those with broader criteria. Specific criteria may include age limitations or not meeting the specific criteria based on the screening tools (Twardzik et al., 2017). Similar to both recognition and diagnosis, the availability of services and funding played a major role in the rate of early intervention. As mentioned previously, the funding cuts in the United Kingdom have shown to be a barrier to access to early intervention (Ridding and Williams, 2019). Similarly, in the United States, if the coverage of services was increased and financial barriers were reduced, the involvement of early intervention was noted to be increased. The access was notably increased, especially the subsidy, which also involved other related costs such as childcare and transport (Mathews et al., 2018).

There are multiple factors of access towards recognition for potential need, diagnosis, and early intervention in terms of child developmental monitoring. As the child factors are non-modifiable, intervention to improve access must be focused on family and service factors. For healthcare providers, the introduction of workshops and training specific to child development has shown potential improvement in early intervention access. This was made by improving the early detection of developmental delay and the confidence to diagnose specific developmental delay problems. In the United States, interventions among paediatricians were done with monthly webinars, in-person meetings, and individualized feedback from Expert Work Group for three months. These interventions were statistically shown to improve autism screening family discussion and increase referral for abnormal results (Bright et al., 2019). Another study also showed improvement from 60% to 95% screening after regular staff training and improvement in administration workflow (Meurer et al., 2022). Regular workshops among primary healthcare nurses are also effective in improving their knowledge and commitment to monitoring child development. It was noted that there is a significant increase in developmental surveillance done by them. For instance, asking mother's opinion about child development improved from 73.3% to 100% (Reichert et al., 2015).

Innovation with technology can also be implemented by introducing telephone interviews and screening, especially in hard-to-reach areas. 2-1-1 LA Project for developmental screening and telephone monitoring has greatly improved child screening and monitoring (Roux et al., 2012). Multiple mobile phone applications are introduced to improve parents knowledge and involvement in child developmental monitoring, which may also increase the detection of abnormalities (Ben-Sasson et al., 2023; Hsu et al., 2020). The introduction of computerized algorithms to make screening decisions was also shown to increase screening for developmental delay, leading to earlier developmental intervention (Carroll et al., 2014). Improvement of health management and human resources can also assist in improving access to early intervention. A study in the USA also found that for developmental monitoring and screening, using system-wide procedures for developmental surveillance, assigning staff members to different levels of responsibility, and modifying implementation systems in response to active implementation monitoring aided recognition and facilitated

diagnosis (Nygren et al., 2012; King et al., 2010). Using parent-completed tools can increase the monitoring of child development and detect any abnormalities in development milestones (Vitrikas et al., 2017). This is also particularly important as most of the barriers mentioned involved limited time and lack of staffing. Apart from that, the usage of parent-completed tools can also increase parents involvement in child development monitoring. The integration of NGOs and health services can also improve access to developmental surveillance, especially for people in rural areas and with different cultural backgrounds (Edwards et al., 2020).

Conclusion

Hence, there are several factors in child developmental monitoring and access to early intervention. It can mainly be categorized into three components: child, family, and service factors. As all child factors are non-modifiable, focus on terms of improvements that must be made towards the family and services factor. Early detection and intervention are essential as multiple studies have shown that the earlier the intervention is provided, the better the prognosis of the child. The importance of a strong support system, both formally through healthcare and education professionals and informally through family and community networks, is underscored. Addressing these factors requires a holistic and inclusive approach, ensuring that all children have equal opportunities to benefit from early intervention regardless of their background or circumstances.

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Conflict of interest

The authors confirm that there is no conflict of interest involve with any parties in this research study.

REFERENCES

[1] Aldayel, A.S., Aldayel, A.A., Almutairi, A.M., Alhussain, H.A., Alwehaibi, S.A., Almutairi, T.A. (2020): Parental Knowledge of Children's Developmental Milestones in Riyadh, Saudi Arabia. – International Journal of Pediatrics 8p.

[2] American Academy of Pediatrics (AAP) (2022): Developmental Surveillance and Screening. – AAP Web Portal 6p.

[3] Anderson, L.M., Shinn, C., Fullilove, M.T., Scrimshaw, S.C., Fielding, J.E., Normand, J., Carande-Kulis, V.G. (2003): The effectiveness of early childhood development programs: A systematic review. – American Journal of Preventive Medicine 24(3): 32-46.

[4] Barger, B., Rice, C., Wolf, R., Roach, A. (2018): Better together: Developmental screening and monitoring best identify children who need early intervention. – Disability and Health Journal 11(3): 420-426.

[5] Ben-Sasson, A., Jacobs, K., Ben-Sasson, E. (2023): Early childhood tracking application: Correspondence between crowd-based developmental percentiles and clinical tools. – Health Informatics Journal 29(1): 18p.

[6] Bickel, J., Bridgemohan, C., Sideridis, G., Huntington, N. (2015): Child and family characteristics associated with age of diagnosis of an autism spectrum disorder in a tertiary care setting. – Journal of Developmental and Behavioral Pediatrics: JDBP 36(1): 1-7.

[7] Birkin, C., Anderson, A., Seymour, F., Moore, D.W. (2008): A parent-focused early intervention program for autism: who gets access? – Journal of Intellectual & Developmental Disability 33(2): 108-116.

[8] Bowker, A., D'Angelo, N.M., Hicks, R., Wells, K. (2011): Treatments for autism: parental choices and perceptions of change. – Journal of Autism and Developmental Disorders 41(10): 1373-1382.

[9] Brett, D., Warnell, F., McConachie, H., Parr, J.R. (2016): Factors Affecting Age at ASD Diagnosis in UK: No Evidence that Diagnosis Age has Decreased Between 2004 and 2014. – Journal of Autism and Developmental Disorders 46(6): 1974-1984.

[10] Bright, M.A., Zubler, J., Boothby, C., Whitaker, T.M. (2019). Improving Developmental Screening, Discussion, and Referral in Pediatric Practice. – Clinical Pediatrics 58(9): 941-948.

[11] Carroll, A.E., Bauer, N.S., Dugan, T.M., Anand, V., Saha, C., Downs, S.M. (2014): Use of a computerized decision aid for developmental surveillance and screening: a randomized clinical trial. – JAMA Pediatrics 168(9): 815-821.

[12] Chakraborty, S., Chakraborty, A., Mitra, S., Gupta, S., Lahiri, A., Banerjee, N. (2022): Evaluation of the rashtriya bal swasthya karyakram (RBSK): A national children healthcare program in a health district of West Bengal, India. – Indian Journal of Public Health 66(3): 307-312.

[13] Chauhan, S., Prasad, P., Rai, P.L., Khurana, B. (2017): Parental Perceptions Influencing the Utilization of Early Intervention Services in Children with Developmental Delay. – Journal of Nepal Paediatric Society 37: 51-58.

[14] Choo, Y.Y., Agarwal, P., How, C.H., Yeleswarapu, S.P. (2019): Developmental delay: identification and management at primary care level. – Singapore Medical Journal 60(3): 119-123.

[15] Crane, L., Chester, J.W., Goddard, L., Henry, L.A., Hill, E. (2016): Experiences of autism diagnosis: A survey of over 1000 parents in the United Kingdom. – Autism: The International Journal of Research and Practice 20(2): 153-162.

[16] Dababnah, S., Shaia, W.E., Campion, K., Nichols, H.M. (2018): "We Had to Keep Pushing": Caregivers' Perspectives on Autism Screening and Referral Practices of Black Children in Primary Care. – Intellectual and Developmental Disabilities 56(5): 321-336.

[17] Dosreis, S., Weiner, C.L., Johnson, L., Newschaffer, C.J. (2006): Autism spectrum disorder screening and management practices among general pediatric providers. – Journal of Developmental and Behavioral Pediatrics: JDBP 27(2 Suppl): S88-S94.

[18] Duby, J.C., Lipkin, P.H., Macias, M.M., Wegner, L.M., Duncan, P., Hagan, J.F., Cooley, W.C., Swigonski, N., Biondich, P.G., Lollar, D., Ackermann, J., Brin, A., Crane, M., Gibson, A., Skipper, S.M., Steinberg-Hastings, D., Capers, M. (2006): Identifying infants and young children with developmental disorders in the medical home: An algorithm for developmental surveillance and screening. – Pediatrics 118(1): 405-420.

[19] Edwards, K., Rimes, T., Smith, R., Fernandez, R., Stephenson, L., Son, J., Sarkozy, V., Perkins, D., Eapen, V., Woolfenden, S. (2020): "Improving Access to Early Childhood Developmental Surveillance for Children from Culturally and Linguistically Diverse (CALD) Background". – In International Journal of Integrated Care 20(2): 7p.

[20] Evans, D.L., Feit, M.D., Trent, T. (2016): African American Parents and Attitudes About Child Disability and Early Intervention Services. – Journal of Social Service Research 42(1): 96-112.

[21] First, L.R., Palfrey, J.S. (1994): The infant or young child with developmental delay. – The New England Journal of Medicine 330(7): 478-483.

[22] Garg, P., Ha, M.T., Eastwood, J., Harvey, S., Woolfenden, S., Murphy, E., Dissanayake, C., Williams, K., Jalaludin, B., McKenzie, A., Einfeld, S., Silove, N., Short, K., Eapen, V. (2018): Health professional perceptions regarding screening tools for developmental surveillance for children in a multicultural part of Sydney, Australia. – BMC Family Practice 19(1): 12p.

[23] Guevara, J.P., Gerdes, M., Localio, R., Huang, Y.V, Pinto-Martin, J., Minkovitz, C.S., Hsu, D., Kyriakou, L., Baglivo, S., Kavanagh, J., Pati, S. (2013): Effectiveness of developmental screening in an urban setting. – Pediatrics 131(1): 30-37.

[24] Hirai, A.H., Kogan, M.D., Kandasamy, V., Reuland, C., Bethell, C. (2018): Prevalence and Variation of Developmental Screening and Surveillance in Early Childhood. – JAMA Pediatrics 172(9): 857-866.

[25] Hochstedler, K.A., Bell, G., Park, H., Ghassabian, A., Bell, E.M., Sundaram, R., Grantz, K.L., Yeung, E.H. (2021): Gestational Age at Birth and Risk of Developmental Delay: The Upstate KIDS Study. – American Journal of Perinatology 38(10): 1088-1095.

[26] Hss, A.S. (2008): Meeting the needs of children with disability in Malaysia [Editorial]. – The Medical Journal of Malaysia 63: 1-3.

[27] Hsu, C.F., Chien, T.W., Chow, J.C., Yeh, Y.T., Chou, W. (2020): An App for Identifying Children at Risk for Developmental Problems Using Multidimensional Computerized Adaptive Testing: Development and Usability Study. – JMIR Pediatrics and Parenting 3(1): 10p.

[28] Hussein, A.M., Pellicano, E., Crane, L. (2019): Understanding and awareness of autism among Somali parents living in the United Kingdom. – Autism : The International Journal of Research and Practice 23(6): 1408-1418.

[29] Institute for Public Health (IPH) (2022): National Health and Morbidity Survey (NHMS) 2022 : Maternal and Child Health Malaysia. – In Institute for Public Health 284p.

[30] Ismail, H., Mohd Ibrahim, H., Phak, N.H., Thomas, T. (2019): Paediatric Protocols for Malaysian Hospitals 4th Edition. – Kementerian Kesihatan Malaysia 686p.

[31] Jimenez, M.E., Fiks, A.G., Shah, L.R., Gerdes, M., Ni, A.Y., Pati, S., Guevara, J.P. (2014): Factors associated with early intervention referral and evaluation: a mixed methods analysis. – Academic Pediatrics 14(3): 315-323.

[32] Karim, K., Cook, L., O'Reilly, M. (2014): Diagnosing autistic spectrum disorder in the age of austerity. – Child: Care, Health and Development 40(1): 115-123.

[33] King, T.M., Glascoe, F.P. (2003): Developmental surveillance of infants and young children in pediatric primary care. – Current Opinion in Pediatrics 15(6): 624-629.

[34] King, T.M., Tandon, S.D., Macias, M.M., Healy, J.A., Duncan, P.M., Swigonski, N.L., Skipper, S.M., Lipkin, P.H. (2010): Implementing developmental screening and referrals: lessons learned from a national project. – Pediatrics 125(2): 350-360.

[35] Kuo, H.T., Muo, C.H., Chang, Y.T., Lin, C.K. (2015): Change in prevalence status for children with developmental delay in Taiwan: A nationwide population-based retrospective study. – Neuropsychiatric Disease and Treatment 11: 1541–1547.

[36] Lipkin, P.H., Macias, M.M., Baer Chen, B., Coury, D., Gottschlich, E.A., Hyman, S.L., Sisk, B., Wolfe, A., Levy, S.E. (2020): Trends in Pediatricians' Developmental Screening: 2002-2016. – Pediatrics 145(4): 11p.

[37] Lui, J.H.L., Danko, C.M., Triece, T., Bennett, I.M., Marschall, D., Lorenzo, N.E., Stein, M.A., Chronis-Tuscano, A. (2023): Screening for parent and child ADHD in urban pediatric primary care: pilot implementation and stakeholder perspectives. – BMC Pediatrics 23(1): 11p.

[38] Lung, F.W., Shu, B.C., Chiang, T.L., Lin, S.J. (2010): Parental concerns based general developmental screening tool and autism risk: the Taiwan National Birth cohort study. – Pediatric Research 67(2): 226-231.

[39] Mariana, A.M.A., Wong, S.L. (2011): Children with learning disabilities in the paediatric clinic, Hospital Tuanku Ja'afar Seremban: an overview. – The Medical Journal of Malaysia 66(5): 487-490.

[40] Marshall, J., Tanner, J.P., Kozyr, Y.A., Kirby, R.S. (2015): Services and supports for young children with Down syndrome: parent and provider perspectives. – Child: Care, Health and Development 41(3): 365-373.
[41] Matheis, M., Matson, J.L. (2015): Autism Spectrum Disorder Screening Refusal Rates: Findings from a Statewide Early Intervention Program. – Journal of Developmental and Physical Disabilities 27(6): 755-770.
[42] Mathews, T.L., Lugo, A.M., King, M.L., Needelman, L.L., McArdle, P.E., Romer, N., Terry, M., Menousek, K., Evans, J.H., Higgins, W.J. (2018): Expanding Access to Clinical Services for Toddlers with Autism Spectrum Disorders. – Journal of Pediatric Health Care: Official Publication of National Association of Pediatric Nurse Associates & Practitioners 32(2): 173-183.
[43] Mazurek, M.O., Kuhlthau, K., Parker, R.A., Chan, J., Sohl, K. (2021): Autism and General Developmental Screening Practices Among Primary Care Providers. – Journal of Developmental and Behavioral Pediatrics: JDBP 42(5): 355-362.
[44] McManus, B.M., Carle, A.C., Rapport, M.J. (2014): Classifying infants and toddlers with developmental vulnerability: who is most likely to receive early intervention? – Child: Care, Health and Development 40(2): 205-214.
[45] Meurer, J., Rohloff, R., Rein, L., Kanter, I., Kotagiri, N., Gundacker, C., Tarima, S. (2022): Improving child development screening: implications for professional practice and patient equity. – Journal of Primary Care & Community Health 13: 13p.
[46] Moh, T.A., Magiati, I. (2012): Factors associated with parental stress and satisfaction during the process of diagnosis of children with Autism Spectrum Disorders. – Research in Autism Spectrum Disorders 6(1): 293-303.
[47] Nelson, H.D., Nygren, P., Walker, M., Panoscha, R. (2006): Screening for speech and language delay in preschool children: systematic evidence review for the US Preventive Services Task Force. – Pediatrics 117(2): e298-e319.
[48] Nygren, G., Cederlund, M., Sandberg, E., Gillstedt, F., Arvidsson, T., Carina Gillberg, I., Westman Andersson, G., Gillberg, C. (2012): The prevalence of autism spectrum disorders in toddlers: a population study of 2-year-old Swedish children. – Journal of Autism and Developmental Disorders 42(7): 1491-1497.
[49] Olusanya, B.O., Davis, A.C., Wertlieb, D., Boo, N.Y., Nair, M.K.C., Halpern, R., Kuper, H., Breinbauer, C., De Vries, P.J., Gladstone, M., Halfon, N. (2018): Developmental disabilities among children younger than 5 years in 195 countries and territories, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. – The Lancet Global Health 6(10): e1100-e1121.
[50] Partain, P.I., Kumbamu, A., Asiedu, G.B., Cristiani, V., Deling, M., Weis, C., Lynch, B. (2019): Evaluation of Community Programs for Early Childhood Development: Parental Perspectives and Recommendations. – Maternal and Child Health Journal 23(1): 120-130.
[51] Payakachat, N., Tilford, J.M., Kuhlthau, K.A. (2018): Parent-Reported Use of Interventions by Toddlers and Preschoolers With Autism Spectrum Disorder. – Psychiatric Services (Washington, D.C.) 69(2): 186-194.
[52] Petersen, M.C., Kube, D.A., Palmer, F.B. (1998): Classification of developmental delays. – Seminars in Pediatric Neurology 5(1): 2-14.
[53] Phillips, D.A., Shonkoff, J.P. (Eds) (2000): From neurons to neighborhoods: The science of early childhood development. – Washington (DC): National Academies Press (US) 561p.
[54] Rah, S.S., Hong, S.B., Yoon, J.Y. (2020): Prevalence and Incidence of Developmental Disorders in Korea: A Nationwide Population-Based Study. – Journal of Autism and Developmental Disorders 50(12): 4504-4511.
[55] Reichert, A.P. da S., Collet, N., Eickmann, S.H., Lima, M. de C. (2015): Child development surveillance: intervention study with nurses of the Family Health Strategy. – Revista Latino-Americana de Enfermagem 23(5): 954-962.

[56] Rice, C.E., Naarden Braun, K. Van, Kogan, M.D., Smith, C., Kavanagh, L., Strickland, B., Blumberg, S.J. (2014): Screening for developmental delays among young children--National Survey of Children's Health, United States, 2007. – MMWR Supplements 63(2): 27-35.
[57] Ridding, A., Williams, J. (2019): Being a dad to a child with Down's syndrome: Overcoming the challenges to adjustment. – Journal of Applied Research in Intellectual Disabilities: JARID 32(3): 678-690.
[58] Roux, A.M., Herrera, P., Wold, C.M., Dunkle, M.C., Glascoe, F.P., Shattuck, P.T. (2012): Developmental and autism screening through 2-1-1: reaching underserved families. – American Journal of Preventive Medicine 43(6 Suppl 5): S457-S463.
[59] Ryberg, K.H. (2015): Evidence for the Implementation of the Early Start Denver Model for Young Children With Autism Spectrum Disorder. – Journal of the American Psychiatric Nurses Association 21(5): 327-337.
[60] Rydz, D., Shevell, M.I., Majnemer, A., Oskoui, M. (2005): Developmental screening. – Journal of Child Neurology 20(1): 4-21.
[61] Rydz, D., Srour, M., Oskoui, M., Marget, N., Shiller, M., Birnbaum, R., Majnemer, A., Shevell, M.I. (2006): Screening for developmental delay in the setting of a community pediatric clinic: a prospective assessment of parent-report questionnaires. – Pediatrics 118(4): e1178-e1186.
[62] Sajedi, F., Vameghi, R., Kraskian Mujembari, A. (2014): Prevalence of undetected developmental delays in Iranian children. – Child: Care, Health and Development 40(3): 379-388.
[63] Saleh, S., AlGhfeli, M., Al Mansoori, L., Al Kaabi, A., Al Kaabi, S., Nair, S. C. (2023): Knowledge and Awareness Among Mothers Regarding Early Childhood Development: A Study From the United Arab Emirates. – Cureus 15(4): 9p.
[64] Sharma, R., Bhatt, G., Bakshi, H., Oza, D., Dave, R., Pirzada, A., Jani, D., Bapat, N., Mehta, R. (2022): Profile, Quality of Life and the Client Satisfaction of Beneficiaries Registered under Rashtriya Bal Swasthya Karyakram (RBSK) at an Urban Primary Health Centre, Ahmedabad: A Retrospective Cohort Study. – Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine 47(4): 567-570.
[65] Sheeran, L., Zhao, L., Buchanan, K., Xenos, S. (2021): Enablers and Barriers to Identifying Children at Risk of Developmental Delay: A Pilot Study of Australian Maternal and Child Health Services. – Maternal and Child Health Journal 25(6): 967-979.
[66] Shekhawat, D.S., Gupta, T., Singh, P., Sharma, P., Singh, K. (2022): Monitoring tools for early identification of children with developmental delay in India: an update. – Child Neuropsychology: A Journal on Normal and Abnormal Development in Childhood and Adolescence 28(6): 814-830.
[67] Shyu, Y.I. L., Tsai, J.L., Tsai, W.C. (2010): Explaining and selecting treatments for autism: parental explanatory models in Taiwan. – Journal of Autism and Developmental Disorders 40(11): 1323-1331.
[68] Sices, L., Stancin, T., Kirchner, L., Bauchner, H. (2009): PEDS and ASQ developmental screening tests may not identify the same children. – Pediatrics 124(4): e640-e647.
[69] Singhi, P., Malhi, P. (2023): Early Diagnosis of Autism Spectrum Disorder: What the Pediatricians Should Know. – Indian Journal of Pediatrics 90(4): 364-368.
[70] The Domestic Policy Council (2015): Affordable Care Act. – The United States of America 33p.
[71] Thomas, P., Zahorodny, W., Peng, B., Kim, S., Jani, N., Halperin, W., Brimacombe, M. (2012): The association of autism diagnosis with socioeconomic status. – Autism : The International Journal of Research and Practice 16(2): 201-213.
[72] Traube, D.E., Palmer Molina, A., Taylor, A., Kemner, A., Shah, L., Rau, A. (2021): Caregiver experiences of developmental screening. – Child: Care, Health and Development 47(3): 319-328.

[73] Twardzik, E., Cotto-Negrón, C., MacDonald, M. (2017): Factors related to early intervention Part C enrollment: A systematic review. – Disability and Health Journal 10(4): 467-474.
[74] Vitrikas, K., Savard, D., Bucaj, M. (2017): Developmental Delay: When and How to Screen. – American Family Physician 96(1): 36-43.
[75] Weitzman, C., Wegner, L., Section on Developmental and Behavioral Pediatrics, Committee on Psychosocial Aspects of Child and Family Health, Council on Early Childhood, and Society for Developmental and Behavioral Pediatrics (2015): Promoting optimal development: Screening for behavioral and emotional problems. – Pediatrics 135(2): 384-395.
[76] Xiong, T., Kaltenbach, E., Yakovenko, I., Lebsack, J., McGrath, P.J. (2022): How to measure barriers in accessing mental healthcare? Psychometric evaluation of a screening tool in parents of children with intellectual and developmental disabilities. – BMC Health Services Research 22(1): 10p.
[77] Zablotsky, B., Black, L.I., Maenner, M.J., Schieve, L.A., Danielson, M.L., Bitsko, R.H., Blumberg, S.J., Kogan, M.D., Boyle, C.A. (2019): Prevalence and Trends of Developmental Disabilities among Children in the United States: 2009-2017. – Pediatrics 144(4): 13p.
[78] Zuckerman, K.E., Lindly, O.J., Sinche, B.K. (2015): Parental concerns, provider response, and timeliness of autism spectrum disorder diagnosis. – The Journal of Pediatrics 166(6): 1431-1439.