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Early identification of autism spectrum disorder in childcare settings: A literature review

MANELI NOURZAD

Université du Québec à Montréal, nourzad.maneli@courrier.uqam.ca

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Abstract

Timely intervention is key in the development of children with autism spectrum disorder (ASD) and early childhood settings present an opportune environment for early diagnosis, particularly in Canada where the identification of ASD in children below the age of four can be further expanded. This review first summarizes the potential benefits and barriers to early identification of ASD in children. There is robust evidence that early detection can result in improved biological and behavioral outcomes in later stages of life despite the subtle and at times elusive signs of ASD in young children. We then focus on the role early childhood educators (ECEs) can play in screening ASD symptoms and survey promising detection tools suited in childcare. Further research on the application of these tools in the hands of ECEs is needed to increase early identification of ASD signs and ensure positive long-term outcomes.

Keywords: autism spectrum disorder, autism symptoms, early screening tools, early childhood settings

Early Identification of Autism Spectrum Disorder in Childcare Settings: A Literature Review

ASD is a neurodevelopmental disorder characterized by impairment in social and communicative skills and manifestation of restrictive repetitive behaviors (American Psychiatric Association, 2013). Early signs of ASD are generally observed within six months of age, and can include motor delays, eating and sleeping disorders, as well as excess in active and passive behavior (Anagnostou et al., 2014; Zwaigenbaum et al., 2019). In later stages of growth, further manifestations of ASD and additional signs such as low responsiveness or repetitive behavior may appear in the context of social interactions with educators or other children. Although a stable diagnosis as early as two years old is possible (Larsen et al., 2020, Larsen, 2015), the formal diagnosis of ASD tends to be generally established later in a child's life, and usually around four years old. This delay is even more significant for children from different ethnic backgrounds and families with limited economic resources, a result of living in neighborhoods with limited access to services such as a comprehensive developmental evaluation (Baio et al., 2018). The U.S. Institute of Medicine (2009) found compelling evidence that healthcare quality varies significantly by race, ethnicity, and language and concluded that analyzing measures of healthcare quality according to race, ethnicity, and language could promote equal access to quality healthcare. According to Pierce and colleagues (2019), when a toddler is identified with ASD, there is a lower probability that they will fall within typical developmental ranges by the age of three. These findings indicate the potential benefits of early interventions for ASD at a very young age. Due to the presence of children under the age of four in early childhood settings, these settings could have an important role in early detection of ASD symptoms.

Prevalence of ASD in children in Québec and Canada

According to the 2019 Canadian Health Survey on Children and Youth (CHSCY), two percent of children under 17 years old were diagnosed with ASD in Canada, with the highest prevalence observed in New Brunswick and the lowest in Saskatchewan. More than half of Canadian children diagnosed with ASD received the diagnosis before reaching five years of age and were predominantly males (over four times more than females). In Québec, the second most populated province of Canada, the prevalence of ASD among children in the one to 17 age group was estimated to be 1.7% (i.e., both lower than the Canadian average and the prevalence observed in Ontario and British Columbia (respectively, 2.1% and 2.2%). CHSCY (2019) also pointed to the presence of other long term health conditions among Canadian children with ASD, most commonly the attention deficit disorder/attention deficit hyperactivity disorder in children with ASD, as well as the role played by socioeconomic factors such as household income. Communication was identified as the most difficult functional area for children aged two to four years with ASD; 52% of children in this age group were considered to have difficulty in communicating, whereas 38% had difficulty in learning and 25% had difficulty playing with other children. Diallo and colleagues (2018) noted a steady rise in the prevalence of ASD in the population of 17 years old and younger across Ontario, Québec, Manitoba, and Nova Scotia, with the highest prevalence of 4.8 per 1,000 observed in Ontario, and a prevalence of 3.0 per 1,000 estimated in Québec on average over the 1999-2012 period. The two provinces respectively experienced fivefold and fourfold increase in the ASD prevalence during the same period.

ASD Screening and Early Detection in a Childcare Setting

Importance of Early Detection and Intervention

The first step in addressing a developmental disorder is the identification. According to the National Collaborating Centre for Women's and Children's Health (2011), screening for ASD entails recognizing particular developmental and behavioral cues regarding ASD symptoms that could potentially raise concerns for caregivers or medical professionals. In contrast, diagnostic assessment is the process of determining whether these concerns can be attributed to ASD or if there is another underlying cause. Interviews, observations, and various assessment tools are among the methods employed for both screening and diagnosing various conditions or disorders.

Early detection of ASD is key for improving developmental outcomes for children who are struggling with this condition. More specifically, detecting ASD symptoms during early years of life can lead to early intervention, and therefore resulting in a better quality of life for children with ASD (Larsen et al., 2020). Four crucial developmental domains that can predict ASD in the early stages of development, spanning from 6 to 24 months, have been identified and serve as primary targets for early intervention. These domains are early attentional control, emotional regulation, social orientation and approach, and communication development. These four domains are important for ensuring a comprehensive approach to early ASD identification (Brian et al., 2015).

Oosterling and others (2010) emphasized that proper educational planning tailored to the needs of a child with ASD can be impeded by a delay in identification of ASD symptoms and consequently its diagnosis. Another reason why it is crucial that identification of ASD symptoms occurs early on in life is that brain development is at its peak during the first few years of life

(Kotulak, 1997), thus the effects of proper early interventions on the brain will be enhanced (Landa, 2018; Rogers et al., 2012). In other words, children's brain structure, language, and social skills can be severely affected if interventions are delayed (Rutter et al., 1999). Such missed opportunities regarding optimal brain development are the reason policymakers are advocating for the early identification of children who may be at risk of developmental delays, including ASD (Chakrabarti et al., 2005; Nelson, 2000).

In the same vein, the American Academy of Pediatrics (AAP) suggests conducting autism screening for all children at 18 and 24 months of age. At 18 months, screening can assist in recognizing cerebral palsy, autism spectrum disorders, global developmental delays, and specific language disorders. For autism, global developmental delays, and specific language disorders, screening should be repeated at the 24- or 30-month check-ups. Additionally, AAP suggests conducting an academic readiness evaluation at ages four to five years. Subsequently, children showing positive screening results should be referred for additional evaluation (Hyman et al., 2020).

Furthermore, there is tangible evidence to suggest that children diagnosed with ASD who undergo early and intensive intervention are more likely to have better developmental progress than those who start intervention after reaching the age of five (Dawson & Osterling, 1997). For the prevention of eating disorders in children with ASD (Savage et al., 2007), and to ensure the well-being of families (Ausderau & Juarez, 2013), intervention programs that target unusual eating patterns in children with ASD should start during early years of life (Saban-Bezalel et al., 2021). A body of research (Jacobson & Mulick, 2000; Jacobson et al., 1998; Jarbrink & Knapp, 2001) shows that early intervention leads to significant behavioral improvements in children with ASD, resulting in substantial cost savings due to the need for fewer intervention sessions for both

families and the health care system that supports them. Early detection of ASD has also demonstrated a correlation with decreased family stress levels; this is achieved by providing the family with proper intervention strategies (Charman & Baron-Cohen, 2006).

Barriers to Early Identification of ASD

There are several obstacles for early detection of autism, and these include factors such as healthcare professionals' insufficient education, low levels of parental education, hesitation on the part of healthcare professionals to provide early diagnoses, long waiting lists, economic challenges within families and communities, geographic location, and parental concerns about potential stigma (Elder et al., 2016; Khowaja et al., 2015; Rosenberg et al., 2011).

The primary challenge in the detection of ASD is the absence of distinctive biological markers, resulting in the reliance on behavioral study as the sole alternative for screening and detection. Nonetheless, biological factors related to children, including gender and weight, and to their parents, including history of diabetes and infectious diseases, can be associated with higher probability of ASD (Zwaigenbaum et al., 2019). In addition, the behavioral signs associated with ASD are often inconspicuous and subtle (Rogé, 2002), without a single sign providing certainty, thus posing a further challenge for diagnosis. Several factors can impede early detection of ASD. Lack of experience on the parent's side especially in relation to a first-born child, and minimization of early signs or denial of symptoms when observed is one factor to consider (Rogé, 2002).

Role of Educators in Early Detection and Screening

Many pediatricians struggle to adhere to the practice guidelines for developmental surveillance and autism screening during routine health related visits, not to mention that not all families have regular access to a pediatrician (Janvier et al., 2016). Consequently, relying only

on pediatricians for ASD screening can lead to a great portion of the ASD population going unnoticed, especially among low-income and racial/ethnic minority families, where parents may not readily recognize the early signs of autism (Janvier et al., 2016). Therefore, it is crucial to identify additional community resources and individuals who maintain regular contact with young children and can effectively carry out developmental monitoring (Branson et al., 2008). Additionally, healthcare professionals may not always recognize ASD symptoms within the limited timeframe of health check-ups (Gabrielsen et al., 2015; Coury, 2015). In general, young children aged 15 to 33 months with ASD can display more typical behavior than atypical behavior (Gabrielsen et al., 2015). This implies that another setting, allowing for repeated and long-term observations, may be necessary to spot atypical behavior, as emphasized by prior researchers (Branson et al., 2008; Dereu et al., 2012).

In families with only one child, children may not overtly display ASD symptoms within the home environment (Au et al., 2021). Since family size has been decreasing over the last decades, the task of identifying ASD signs in their young children has proven to be more difficult for a growing number of parents (De Giacomo & Fombonne, 1998; Zwaigenbaum et al., 2005). In this context, preschool teachers with the appropriate training are an invaluable resource for recognizing potential ASD symptoms in children (Duvekot et al., 2015). According to Rivard and colleagues (2021), in Québec, mothers are frequently the first to raise concerns about their child's development, typically related to language acquisition, while daycare educators are the second most common group to do so. This emphasizes the crucial role of educators in children's lives and their unique ability to observe children in diverse and pivotal situations, including their interactions with peers.

Childcare educators are well suited for early screening of ASD because they have ample opportunities to observe children, are generally aware of typical child development, and can make comparisons among children at similar developmental stages (Branson et al., 2008). Moreover, both daycare professionals and parents can clearly identify symptoms that, in hindsight, differentiated between children with ASD and those without ASD during the period from 12 to 24 months of age (Larsen et al., 2018). Despite the research being limited on whether early childhood educators can effectively serve as capable sources for detecting ASD symptoms, training early childcare providers to screen young children in preschool and daycare settings for ASD seems to be a promising strategy for enhancing access to early diagnosis in communities in general and in underserved communities in particular (Janvier et al., 2016).

Available Tools for Early Detection of ASD

The process of screening requires the use of tools designed to identify potential concerns of a disease. These tools are standardized (they are reliable, valid, scored consistently, have a clear algorithm for interpretation, and can be administered the same to everyone) for specific ages and stages of development (Delahunty, 2015). The screening tests can be broadly classified into two categories: problem-specific screening and broadband developmental-behavioral screening. Factors to consider when selecting a test include the intended age range, the time required for completion and scoring, cost, whether the test is paper-based or electronic, and language availability (Delahunty, 2015). Examples of autism-specific screening tools include the Modified Checklist for Autism in Toddlers (M-CHAT) for 16-30 months of age and Pervasive Developmental Disorders Screening Test-II (PDDST-II) for 12-48 months of age. Examples of broadband developmental-behavioral screening tools include Ages and Stages Questionnaire, third edition (ASQ) which is a child monitoring questionnaire completed by parents for 1-66

months of age, Social Emotional Test (age varies), the Parents' Evaluation of Developmental Status Test (PEDS) for 0 to 8 years of age, and Brigance Early Childhood Screens III for 0-35 months of age.

Furthermore, detection tools can be categorized into one-time screening processes that are applied either to the entire population (level 1 tools) or to specific subsets of the population (level 2 tools), such as siblings of children with ASD or individuals in clinical settings (Choueiri et al., 2021). Additionally, developmental surveillance involves ongoing developmental monitoring, where children's progress is observed and assessed continuously over a period (Barbaro & Dissanayake, 2010; Barbaro et al., 2011). According to Barbaro & Dissanayake (2009) incorporating autism-specific screening instruments within a framework of developmental surveillance is advantageous and more time-effective. In this integrated approach, using a verified tool becomes part of the ongoing process of collecting developmental information. With this method, every young child is consistently and frequently screened for early indicators of autism during routine interactions with healthcare providers, such as primary care nurses, doctors, or pediatricians.

ASD Detection Tools for ECEs

Larsen and colleagues (2018) note the limited research on the early ASD symptoms in daycare centers, especially in children under 24 months. Most existing ASD screening tools are either parent- or healthcare professional-administered, and they were primarily developed for older children. These tools tend to be lengthy, comprising over ten items or requiring specialized training. The use of a brief observation tool within daycare settings could offer a promising approach for early ASD detection.

Ensuring early identification of ASD necessitates having relevant tools at educators'

disposal. Educators need tools that are suitable for the daycare setting and easy to administer. Larsen and colleagues (2018) conducted a study in Norway to explore the feasibility of creating a short observation list for ASD screening in children aged 12 to 24 months. They identified six indicators that effectively distinguished children with ASD from those with typical development, providing educators with a valuable resource for early detection. This study served as a foundation for creating a short checklist to observe ASD signs in children aged 12 to 24 months within daycare centers. To fully gauge its potential as an early screening tool, it is imperative to conduct additional prospective studies on children within this age group, assessing its sensitivity and specificity against established standard measures.

The Checklist for Early Signs of Developmental Disorders (CESDD) is specifically developed for childhood educators to be used for children three to 39 months of age at daycares (Dereu et al., 2012). This checklist consists of 25 dichotomous items of which a certain number based on the age of the child are considered when administering the tool. Dereu et al. (2012) found that CESDD accurately differentiates between children with ASD symptoms and those without it. Additionally, its discriminant power is as good as the Social Communication Questionnaire (SCQ), which is a questionnaire for parents which consists of 40 items pertaining to ASD symptoms that are likely to be observed by a primary caregiver such as lack of eye contact. The SCQ was originally developed by Rutter and colleagues (2003a). Janvier and colleagues (2016) suggested that conventional ASD screening tools, such as M-CHAT which is a 23-item parents report checklist originally developed by Robins and others (2001), and the Social Communication Questionnaire (SCQ) mentioned above, could be used by early childcare educators, although further research on their accuracy in diverse populations is needed.

The Classroom Observation Scale (COS) is a tool for identifying young preschoolers who may be more susceptible to ASD in their natural setting (Au et al., 2021). With its 13-item scale, this tool allows educators and medical staff without specialized clinical expertise to pinpoint preschool-aged children (during the first year of preschool) who may have a greater likelihood of ASD compared to their peers by observing their social interactions (APA, 2013). Social impairment, including challenges in forging, sustaining, and comprehending relationships, as well as difficulties with social-emotional exchange, is key in ASD diagnosis. Moreover, one of the signs of social impairment in autism during childhood is the inability to form peer relationships that encompass a reciprocal exchange of interests, activities, and emotions, despite having adequate chances and being mentally capable of doing so (World Health Organization, 2004).

The AAP recommends universal ASD screening for two-year-olds, however current tools such as M-CHAT and PEDS often lack robust psychometric properties for widespread use. To address this, the Social Attention and Communication Surveillance tool, now known as SACS-R, was developed and validated in a large community-based sample (Barbaro & Dissanayake, 2010; Barbaro et al., 2011). The SACS-R comprises a set of structured observational checklists that outline developmental milestones and essential behavioral indicators associated with autism, thereby facilitating referrals for assessment and early intervention support. These checklists can be employed during play sessions with children aged 12, 18, and 24 months, as well as with children between the ages of three and five years (Barbaro & Dissanayake, 2013). Prior to using the SACS-R, assessors receive training to determine whether a child's behavior for each checklist item is typical or atypical. This evaluation goes beyond simply checking if a behavior is present or not since atypical behavior can also be explained as showing an uncommon or an inconsistent

behavior. The behavior may also be considered atypical if it does not occur in conjunction with other expected behaviors, painting a more comprehensive picture of the child's developmental status (Barbaro & Dissanayake, 2010; Barbaro et al., 2011). Additionally, Mozolic-Staunton and colleagues (2021) noted that ECEs have successfully leveraged a training on developmental delays, using SACS-R for identifying children with autism in the context of the children's everyday routines and environments.

Potential Challenges for ECEs

Early detection of autism by ECEs is not without its challenges. Oosterling and colleagues (2010) highlighted the delicate nature of early screening for ASD, where falsely informing parents of the presence of ASD symptoms (false positive results) can cause anxiety, and not informing the parents of existence of ASD symptoms in their child (false negatives) can delay interventions. Furthermore, preschool teachers might hesitate to alert parents when they suspect a child may have ASD, which is often driven by the fear of causing unnecessary alarm or concern (Au et al., 2020). Even though many ECEs possess some prior knowledge of developmental screening tools, researchers have indicated that they may not always feel at ease of sharing their concerns related to ASD with parents (Tomlin et al., 2013). Moreover, ECEs encounter many obstacles when it comes to implementing assessment tools including loss of instructional time due to standardized assessments (Schachter et al., 2019), difficulties in integrating naturalistic assessment into regular classroom routines, and the challenges of tending to the needs of other children not undergoing assessment (Chen & McNamee, 2006). According to Rispoli and colleagues (2021), despite the screening tools being valuable for early identification of ASD, there has been relatively little research on how practical these tools are in early care and education settings. A survey conducted by Dionne and others (2006) involving

early childhood education professionals in Québec is one of the few studies on this topic in Canada. The researchers revealed that most early childhood educators found the ASQ to be both time-efficient and user-friendly.

Conclusion

The current literature underscores the importance of early detection and intervention for children with ASD, particularly in early childhood settings. This review has highlighted both the significant benefits and persistent challenges associated with early identification. Despite the subtle and often elusive nature of ASD symptoms in young children, early detection is crucial for improving long-term biological and behavioral outcomes. ECEs are uniquely positioned to play a pivotal role in the early screening of ASD due to their consistent and close interactions with children during critical developmental periods. However, the successful implementation of this role is contingent upon further research to validate and refine screening tools that are feasible and effective in daycare and preschool settings. Addressing the barriers to early detection, including the training and support of ECEs, is essential for expanding early identification efforts, particularly in diverse and underserved populations. Continued efforts are necessary to enhance the accessibility and accuracy of early screening tools in childcare settings and to ensure that children with ASD receive the timely interventions necessary for optimal development.

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