

# Accuracy of *Modified Checklist for Autism in Toddlers (M-CHAT)* in Detecting Autism and Other Developmental Disorders in Community Clinics

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**Abstract** This study determined the accuracy of *Modified Checklist for Autism in Toddlers (M-CHAT)* in detecting toddlers with autism spectrum disorder (ASD) and other developmental disorders (DD) in community mother and child health clinics. We analysed 19,297 eligible toddlers (15–36 months) who had *M-CHAT* performed in 2006–2011. Overall sensitivities for detecting ASD and all DD were poor but better in the 21 to <27 months and 27–36-month age cohorts (54.5–64.3%). Although positive predictive value (PPV) was poor for ASD, especially the younger cohort, positive *M-CHAT* helped in detecting all DD (PPV = 81.6%). This suggested *M-CHAT* for screening ASD was accurate for older cohorts (>21 months) and a useful screening tool for all DD.

**Keywords** Autism spectrum disorder · Developmental disorders · Developmental screening · Accuracy · Early detection · Community

## Introduction

Developmental disorders (DD) which include autism spectrum disorder (ASD), intellectual disabilities (ID) and cerebral palsy are a group of neurodevelopmental conditions that impair a child's physical, speech and language, learning or cognition, and behavioral development; as well as social functioning. They are common with an estimated prevalence of 17% among young children (Boyle et al. 2011). In the United States, the overall prevalence of ASD is 14.7 per 1000 (one in 68) children aged 8 years (Autism and Developmental Disabilities Monitoring [ADDM] Network 2014).

To improve the functional outcomes of children with ASD and DD, early detection and intervention are widely recommended (Bailey et al. 2005; Barnett 1998). With early intervention programs, a better outcome is also expected of children with autism (Eaves and Ho 2004; Harris and Handleman 2000). However, detecting ASD and DD in young children is challenging, with the majority only discovered at their school age (Corrigan et al. 1996). On the other hand, parents of children with ASD first report concerns on their child's development generally when the child is around 17 to 18 months of age, with an average age of 14 to 15 months, and a significant number below age 11 months (Kleinman et al. 2008). The vast majority of children with ASD are undiagnosed well after the age of three years or even later (Gray et al. 2006). Sometimes, differentiating children with developmental problems from those who are developing normally can be difficult as well. Thus, early screening using standardized developmental screening tests is essential to

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