

## Screening for Autistic Spectrum Disorders by Using ESAT Questionnaire: A Study Done in the Urban Settings of Bangladesh

Sharmin S<sup>1</sup>, Halim KS<sup>2</sup>, Sultan Z<sup>3</sup>, Haque KM<sup>4</sup>

### Abstract

The Early Screening of Autistic Trait Questionnaire (ESAT) is a tool for detecting the early signs of ASD – as developed by Dietz and colleagues in 2006 as a primary ASD screening checklist (of 14 questions checklist). This is a tested and reliable tool to diagnose early signs of autism in children. The aim of the present study is to determine the prevalence of autistic spectrum disorder by early detection method using the ESAT tool and see its correlation with age difference. This cross-sectional study was conducted between January and December of 2016, in 47 schools of Uttara, Ashulia, Nikujo Area of Dhaka City Corporation and Tongi Area of Gazipur City Corporation under Dhaka Division. A total of 1000 children aged 3-5 years were recruited in the study. The research instrument was a semi-structured questionnaire based on ESAT tool. The mean age of the participants was 4.22±0.709 years or (50.4±8.504) months. The age group 3, 4 and 5 years had 167(16.7%), 451(45.1%) and 382(38.2%) respondents respectively. Of them, a total of 517 were males (51.7%) and 483 were females (48.3%). Most of the respondents were Muslims 966(96.6%), rest are Hindus 32(3.2%) and Christians 2(0.2%). Our study revealed a prevalence of early signs of autism in 2.6% cases (26 in 1000). Among children with ASD, absence of some of those signs (like interest in different sorts of objects; expressed feeling, crying/calling when left alone, liked to be cuddled, spoke a few words or utter various words, and pretending to make a cup of tea using a toy cup and teapot) were related to age difference; the results were statistically significant (P<0.05).

CBMJ 2021 January: vol. 10 no. 01 P: 37-42

**Key words:** Autistic spectrum disorders, prevalence, early signs of autism, ESAT tool.

### Introduction

Parents of children with autistic spectrum disorder (ASD) tend to notice abnormalities during first 2 years and many parents notice the first signs of abnormal development before their child's first birthday.<sup>1,2</sup> The most common concerns are delay in speech and language development followed by abnormal social responsiveness, medical problems, difficulties sleeping and eating, delay in reaching milestones of development i.e. abnormal developmental trajectories or developmental regression.<sup>2</sup> The American Academy of Pediatrics (AAP) has recommended universal ASD screening for all young children twice before their second birthday. However, in practice the AAP recommendations are not always followed and many children are not diagnosed before age five.<sup>3</sup> The importance of early diagnosis is gaining momentum within the ASD community, especially as the understanding of how the disorder presents at younger ages grows. Early diagnosis leads to earlier

eligibility for intervention services, and evidence-based research has clearly indicated that early intervention leads to better prognosis.<sup>4,5</sup> However, in our country, there are only few evidence in this field. Bangladesh lacks a national record of prevalence of ASD. In a resource-poor setting like Bangladesh, an easy, cheap, but reliable tool is needed to determine the early signs of ASD in children.

1. Dr. Saida Sharmin, Assistant Professor, Department of Community Medicine, Aichi Medical College, Uttara, Dhaka.
2. Prof. Kazi Shafiqul Halim, Professor, Department of Epidemiology, National Institute of Preventive and Social Medicine (NIPSOM), Mohakhali, Dhaka.
3. Dr. Zobayed Sultan, Child Health Specialist, Sherpur, Bogura.
4. Dr. Kazi Mahbulul Haque, Assistant Professor, Department of Community Medicine, Brahmanbaria Medical College, Brahmanbaria.

#### Address of correspondence:

Email: [drsaida2012@gmail.com](mailto:drsaida2012@gmail.com)  
Mobile: 01711353805

In most screening procedures, diagnosis is done based on observation of the individual's communication, behaviour, and developmental levels.<sup>5-7</sup> However, because many of the behaviours associated with autism are shared by other disorders, various medical tests may be ordered to rule out or identify other possible causes of the symptoms being exhibited.<sup>3,5</sup> The Early Screening of Autistic Trait (ESAT) is a tool for detecting the early signs of ASD – as developed by Dietz and colleagues in 2006 as a primary ASD screening checklist<sup>8</sup>, and its design was based on the symptoms of ASD and seeks to differentiate infants aged 0-36 months from children with other types of developmental problems. Even though it is used for screening the behaviour of toddlers, it is focused more on detecting neurodevelopmental issues. It has 14 different instruments that are focused on a child's behaviours during playing, eye contact, joint attention, reactions, verbal and nonverbal communication, and interest in others.<sup>8</sup> This is a tested and reliable tool to diagnose early signs of autism in children. Hence, we proposed the present study to determine the prevalence of autistic spectrum disorder by early detection method using the ESAT tool and the correlation of those early signs with age. The study was based on urban settings, where people are more educated, responsible, cautious and motivated.

## Materials and Methods

This cross-sectional study was conducted between January and December of 2016. Our study population was all the school going children aged 3-5 years whose parents were willing to participate in the study. We excluded children who were already diagnosed as having some forms of autistic spectrum disorder. However, a convenient sampling technique was followed to participate in the study. We excluded children who were already diagnosed as having some forms of autistic spectrum disorder. However, a convenient sampling technique was followed to select the samples from 47 schools of Uttara, Ashulia,

Nikujo Area of Dhaka City Corporation and Tongi Area of Gazipur City Corporation under Dhaka Division, Bangladesh. A total of 1000 children aged 3-5 years, who fulfilled the selection criteria, were recruited in the study. The instrument was pre-tested among 10 children in Azampur Govt. Primary School at Uttara Area under Dhaka City Corporation for clarity, accuracy and unambiguity and to find out the validity of the questions. Minor modifications were incorporated in the final interview schedule. The research instrument contained mainly screening questionnaire and structured questions with few unstructured questions. Hence, the final study questionnaire was composed with socio-demographic and autistic spectrum disorder related questions, a 14-item Early Screening of Autistic Traits Questionnaire (ESAT).<sup>8</sup> Children with 3 or more negative scores were considered to be at high-risk of developing ASD.<sup>8</sup> The checklist is undertaken by the parents or primary caregivers of the child and administered by one of the researchers. All the questions given on the checklist have either yes or no response options, and the examination takes approximately 10-15 minutes to complete.

The proportions of early sign of autism were determined by percentage. Chi-square ( $\chi^2$ ) test was done to see the association of early signs of autism with age. All the tests were two tailed and  $p < 0.05$  was considered to be statistically significant. SPSS (Statistical Package for Social Science) version 16.0 software was used to analyze the data. This research was approved by the Institutional Ethical Committee of National Institute of Preventive and Social Medicine (NIPSOM), Dhaka, Bangladesh.

## Results

The mean age of the participants was  $4.22 \pm 0.709$  years or  $(50.4 \pm 8.504)$  months. The age group 3, 4 and 5 years had 167(16.7%), 451(45.1%) and 382(38.2%) respondents respectively. A total of 517 were males (51.7%) and 483 were females (48.3%). Most of the respondents were Muslims 966(96.6%), rest include 32(3.2%) Hindus and 2(0.2%) Christians (Table-I).

Our study revealed a prevalence of early signs of autism in 2.6% cases (26 in 1000) (Table-II), by using ESAT tool. Among children with ASD, absence of some of those signs (like interest in different sorts of objects; expressed feeling, crying/calling when left alone, liked to be cuddled, spoke a few words or utter various words, and pretending to make a cup of tea using a toy cup and teapot) were related to age difference; the results were statistically significant ( $P < 0.05$ ) (Table-III).

**Table-I:** Demographic characteristics of the participants (n=1000)

Variables		Frequency (Percentage)
Age	3	167 (16.7)
	4	451 (45.1)
	5	382 (38.2)
Sex	Male	517 (51.7)
	Female	483 (48.3)
Religion	Islam	966 (96.6)
	Hindu	32 (32.2)
	Christian	2 (2.0)

**Table-II:** Early signs of autism as screened by using ESAT Tool (n=1000)

Variables	Yes (Percentage)	No (Percentage)
Interested in different object	996 (99.6)	4 (0.4)
expresses feeling (crying/ smiling) on expected/ appropriate time	996 (99.6)	4 (0.4)
React normal way to sensory stimulation	998 (99.8)	2 (0.2)
If child is left alone, does it start crying/ calling?	993 (99.3)	7 (0.7)
Without stereotype repetitive movement (banging head/ rocking body)	994 (99.4)	6 (0.6)
Own accord, bring objects over you	999 (99.9)	1 (0.1)
Showing interest to other children or adults	992 (99.2)	8 (0.8)
Child likes to be cuddled	994 (99.4)	6 (0.6)
child ever smiled at you or others	995 (99.5)	5 (0.5)
Child likes to play with others	996 (99.6)	4 (0.4)
React to spoken language to for instance (by looking/ listening/ smiling/ babbling)	999 (99.9)	1 (0.1)
Child can speak a few words or utter various words	997 (99.7)	3 (0.3)
Child can follow your gaze to see what you are pointing to	999 (99.9)	1 (0.1)
Can the child ever pretend, make a cup of tea using a toy cup & teapot?	996 (99.6)	4 (0.4)
<b>Early signs of autism present (as done by using ESAT Screening Tool)</b>	<b>26 (2.6)</b>	<b>974 (97.4)</b>

**Table-III:** Early signs of autism and its correlation with age (n=1000)

Variables	Age group						$\chi^2$	P value
	3		4		5			
	Yes	No	Yes	No	Yes	No		
Interested in different object	165(98.8%)	2(1.2%)	449(99.6%)	2(0.4%)	382(100%)	-	4.22	<0.05 <sup>S</sup>
Expresses feeling	165(98.8%)	2(1.2%)	449(99.6%)	2(0.4%)	382(100%)	-	4.22	<0.05 <sup>S</sup>
React to sensory stimulation	166(99.4%)	1(0.6%)	451(100%)	-	381(99.7%)	1(0.3%)	2.308	>0.05 <sup>NS</sup>
If child is left alone, does it start crying/ calling?	164(98.2%)	3(1.8%)	448(99.3%)	3(0.7%)	381(99.7%)	1(0.3%)	3.951	<0.05 <sup>S</sup>
Without stereotype repetitive movement	165(98.8%)	2(1.2%)	450(99.8%)	1(0.2%)	380(99.5%)	2(0.5%)	1.223	>0.05 <sup>NS</sup>
Own accord, bring objects over you	166(99.4%)	1(0.6%)	448(99.3%)	3(0.7%)	382(100%)	-	1.320	>0.05 <sup>NS</sup>
Showing interest to other children or adults	164(98.2%)	3(1.8%)	448(99.3%)	3(0.7%)	380(99.5%)	2(3.1%)	2.560	>0.05 <sup>NS</sup>
Child likes to be cuddled	165(98.8%)	2(1.2%)	447(99.1%)	4(0.9%)	382(100%)	-	3.928	<0.05 <sup>S</sup>
Child ever smiled at you or others	165(98.8%)	2(1.2%)	449(99.6%)	2(0.4%)	381(99.5%)	1(0.3%)	2.098	>0.05 <sup>NS</sup>
Child likes to play with others	166(99.4%)	1(0.6%)	448(99.3%)	3(0.7%)	382(100%)	-	2.496	>0.05 <sup>NS</sup>
React to spoken language to for instance	166(99.4%)	1(0.6%)	451(100%)	-	382(100%)	-	1.162	>0.05 <sup>NS</sup>
Child can speak a few words or utter various words	165(98.8%)	2(1.2%)	450(99.8%)	1(0.2%)	382(100%)	-	5.740	<0.05 <sup>S</sup>
Child can follow your gaze as pointing to something	166(99.4%)	1(.6%)	451(100%)	-	382(100%)	-	1.298	>0.05 <sup>NS</sup>
Can the child ever pretend - making a cup of tea?	165(98.8%)	2(1.2%)	449(99.6%)	2(0.4%)	382(100%)	-	4.222	<0.05 <sup>S</sup>

S=significant, NS= not significant; P value reached from Chi-square ( $\chi^2$ ) test.

## Discussion

In the present study, the mean age of the participants was  $4.22 \pm 0.709$  years or (50.4 $\pm$ 8.504) months. The study finding was very similar to the study findings of Jorm *et al.*<sup>9</sup>, a study done in Australia, where they found the mean age 55.3 $\pm$ 5.7 months. Among 1000 screened school children of the present study, 517 were male (51.7%) and 483 were female (48.3%), which is a bit different from the findings of Jorm *et al.*<sup>9</sup>, where male and female were 63.3% and 36.7% respectively.<sup>11</sup> The difference could be due to difference in sampling techniques, as the former used convenient sampling technique while later used systemic sample technique.

The study estimated that the prevalence of ASD was 2.6% (n=1000) and it is in agreement with other population-based

study, such as 2.64% in South Korea, Japan and China.<sup>10-12</sup> In contrast, a study done in our neighboring country, India, on its diverse populations reported the ASD prevalence was 1.4% among children aged 6-9 years.<sup>13</sup> It is estimated that worldwide about one in 160 children has an ASD.<sup>14</sup> However, it has shown increasing trends in the western world.<sup>15-16</sup> In this study, ASD cases were determined in the overall sample, which were mainstream school population, previously undiagnosed and untreated.

Centers for Disease Control of the United States reported an elevating prevalence rates over years of autistic spectrum disorders and notified it as a major public health issue.<sup>16</sup> Similarly, Fombonne previously reported that the prevalence of autism has been estimated at 13/10,000 and is believed to be rising.<sup>17</sup>

Newschaffer *et al.* reported that autistic disorder prevalence estimates centered at ~5 per 10,000 in the 1960s and 1970s, tended to be ~10 per 10,000 in the 1980s, and have been highly variable since the 1990s with reported estimates as low as 5 per 10,000 and as high as 72 per 10,000.<sup>18</sup> However, the evidence suggests that the majority, if not all, of the reported rise in incidence and prevalence is due to changes in diagnostic criteria and increasing awareness and recognition of autistic spectrum disorders.<sup>19</sup> It is really difficult to find proper correlation of early signs with age due to involvement of multiple factors around. Many early studies had small sample sizes and consequently lacked the statistical power to detect meaningful differences.<sup>5,6,18</sup> Similar happened to ours. Although optimum care was taken by the researchers in every step of this study, some limitations still exist. The present study was conducted in some of the selected schools in urban settings. Hence, the study population might not represent the whole community. Moreover, probability sampling technique could not be employed to recruit the study unit; they were selected conveniently due to time and budget constraints.

## Conclusion

Among the respondents, early warning signs of ASD were present 2.6%, which was about 1 in 39 children. Moreover, some early signs of ASD revealed a relationship with age of the children. Further studies are recommended by using large, population-based epidemiological samples to explore associations between different demographic variables as well as parental variables with the risk of autism all over Bangladesh.

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