Knowledge about autism spectrum disorder among final year medical students in Bangladesh- a cross-sectional study

Introduction: Knowledge about autism spectrum disorders (ASD) among medical professionals is crucial for early diagnosis and intervention. However, studies assessing such knowledge among medical students in Bangladesh are limited. This study aimed to evaluate knowledge about childhood autism among final year MBBS students in Bangladesh.

Material and method: This cross-sectional study was conducted among 300 final year MBBS students from seven medical colleges under Dhaka University from July 2014 to July 2015. Data were collected using a semi-structured questionnaire that included the Knowledge about Childhood Autism among Health Workers (KCAHW) questionnaire. KCAHW assesses knowledge across four domains: social interaction, communication, behavioral patterns, and disorder classification/comorbidities. A composite knowledge score was calculated and was expressed as mean ± standard deviation. Descriptive statistics were presented using tables.

Result: Among participants (mean age 23.19 ±0.90 years, 64% female), the total mean knowledge score was 12.92 ±3.24 out of 19 points. Students showed good knowledge in social interaction domain (mean 6.34 ±1.73 out of 8) with over 80% correctly identifying key features. In communication domain, 79.7% recognized language development delays. Knowledge gaps were evident in behavioral patterns (mean score 2.30 ±1.25 out of 4) and comorbidities (meanscore of 3.47 ±1.51 out of 6). Notable misconceptions included 80% incorrectly identifying autism as childhood schizophrenia, though 71% correctly recognized it as a neurodevelopmental disorder. The most common sources of information regarding autism were television (86.3%), newspaper (80.3%) and internet (80.3%).
Conclusion: Final year MBBS students demonstrated reasonable knowledge about autism's social and communication aspects but showed significant gaps in understanding behavioral patterns and comorbidities. These findings highlight the need for enhanced medical education regarding autism spectrum disorders, particularly focusing on behavioral manifestations and comorbid conditions.

Keywords: Autism Spectrum Disorder, Medical Students, Knowledge Assessment, Bangladesh, KCAHW Questionnaire

Introduction

Autism spectrum disorders (ASD) are complex, lifelong neurodevelopmental conditions primarily of unknown etiology, characterized by a triad of impairments: social development, communication, and repetitive behavior(Mandelbaum *et al.*, 2006). Autism is differentiated from mental retardation by distinct impairments in social and communication development(Bregman, 2005). The condition predominantly affects males, with a male-to-female ratio of 4:1, and the diagnosis typically occurs between three and four years of age(Rhoades, Scarpa and Salley, 2007; Taylor, Jick and MacLaughlin, 2013).

The global prevalence of autism has increased dramatically since the initial epidemiological studies in the late 1960s and early 1970s, rising from approximately 1 in 2,500 children to 1997 estimates of 1-2% of all children(Gillberg and Wing, 1999).Recent estimates found a prevalence of 0.6% of ASD around the world (Salari *et al.*, 2022). Other estimates, such as that of World Health Organization (WHO) suggests the prevalence is around 1%(WHO, 2023).In South Asian developing countries, including Bangladesh, research in this field remains limited despite the rising prevalence.One systematic review found the reported prevalence varies across countries

with a range between 0.09% in India and 1.07% in Sri Lanka(Hossain *et al.*, 2017).The prevalence of autism is a serious but underreported health issue in Bangladesh(Akhter *et al.*, 2018).One study found that among rural children aged 18 – 36 months, 0.75 out of 1000 children is affected by ASD(Akhter *et al.*, 2018). The prevalence might be similar between rural and urban areas (Hoque *et al.*, 2019).While various approaches to autism care in Bangladesh have been recognized as a 'role model' in the South-East Asian region(Soron, 2015), significant gaps persist in the identification and provision of health and social services.

Knowledge and awareness about autism have shown considerable variation among healthcare professionals regarding diagnosis, treatment, and prognosis. Early studies revealed that many professionals across various disciplines lacked accurate knowledge about autism and its manifestations in children and adolescents(Stone, 1987). Significant variations were observed between primary care providers and specialists in the United States(Heidgerken *et al.*, 2005). Similarly, healthcare workers in Sub-Saharan Africa demonstrated various misconceptions regarding the etiology, treatment, and prognosis of autism spectrum disorder(Bakare *et al.*, 2009).

Medical students, as future healthcare providers, play a crucial role in the early recognition and management of autism. Poor knowledge among undergraduate medical students, who will become members of multidisciplinary teams caring for children with autism, may constitute a major barrier to early interventions that could improve quality of life and prognosis. In Bangladesh, previously a few studies explored knowledge of medical students regarding autism. Therefore, the present study aimed to fill this gap by assessing knowledge about childhood autism among undergraduate medical students in various medical colleges under Dhaka University.

Materials and Methods

This cross-sectional descriptive study evaluated knowledge about autism among final year MBBS students in medical colleges under Dhaka University over twelve months from July 2014 to July 2015. Seven medical colleges were selected, including two government institutions (Dhaka Medical College and Shahid Suhrawardi Medical College) and five private colleges (Bangladesh Medical College, Green Life Medical College, Anwer Khan Modern Medical College, Popular Medical College, and Uttara Adhunik Medical College). The study population comprised final year MBBS students who had completed their clinical placements in pediatric and psychiatric departments.A total of 300 students were enrolled, with 100 from two government medical colleges (50 from each) and 200 from five private medical colleges (40 from each). Medical colleges were selected purposively based on accessibility, while participants were randomly selected using attendance sheet-based random tables.

Data were collected using a self-administered questionnaire consisting of three components. The socio-demographic section gathered information about participants' characteristics, previous exposure to children with autism, credited lectures, and clinical exposure duration. The main component was the Knowledge about Childhood Autism among Healthcare Workers (KCAHW)

questionnaire, originally developed in Nigeria(Bakare *et al.*, 2008) and translated and contextualized for local context following a pilot study. This validated tool comprised 19 questions across four domains: social interaction (8 questions), communication (1 question), behavior patterns (4 questions), and co-morbidity and onset (6 questions). Each question had two options ("Yes" and "No") with one correct answer worth one point, yielding a maximum possible score of 19. The third component assessed participants' sources of information about autism.

The questionnaire underwent pre-testing with 10 respondents at Bangladesh Medical College and subsequent pilot testing with 12 students at Northern Medical College. Based on feedback, terminology was clarified, and modifications were incorporated. Data collection was conducted in classrooms before scheduled sessions after obtaining institutional permissions and participant consent.

Data analysis was performed using SPSS version 21. Descriptive statistics analyzed the distribution of socio-demographic variables and knowledge scores. T-tests examined gender-based score differences, while Pearson Chi-Square tests assessed associations between gender and domain scores, as well as between total scores and previous autism exposure or credited lectures. One-way ANOVA evaluated the relationship between clinical exposure duration and total scores, with statistical significance set at $p<0.05$.

The study protocol received approval from the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University, with written informed consent obtained from all participants and confidentiality maintained throughout the study.

Results

Among the 300 participants, the mean age was 23.19 ±0.90 years, with female students comprising nearly two-thirds (64.0%) of respondents. The majority were unmarried (91.3%) and Muslim (89.0%), with Hindu students representing 10.3% of the study population (Table 1).

Table 1. Socio-demographic profile of the participants

Variable	**n (%)**
Age (years), mean ±SD	23.19 ±0.90
Sex	
Male	108 (36.0)
Female	192 (64.0)
Marital status	
Unmarried	274 (91.3)
Married	25 (8.3)
Divorced	1 (0.3)
Religion	
Muslim	267 (10.3)
Hindu	31 (10.3)
Christian	1 (0.3)
Buddhist	1 (0.3)

Table 2 shows the distribution of responses to knowledge related questions in different domains. Regarding knowledge about impairments in social interaction (Domain I), most students correctly identified that children with autism exhibit marked impairment in non-verbal behaviors (82.7%), fail to develop age-appropriate peer relationships (84.7%), and lack social smile (83.7%). They also recognized that these children demonstrate less social or emotional reciprocity (83.0%) and lose interest in their surroundings (81.0%). A relatively lower proportion of students (67.0%) were aware that children with autism lack spontaneous will to share enjoyment or interests with others.In Domain II, which assessed knowledge about communication impairments, 79.7% of students correctly identified that children with autism experience delay or total lack of spoken language development.Knowledge about obsessive-compulsive patterns of behavior (Domain III) showed more variation. While 72.7% of students recognized stereotyped and repetitive movements as characteristic of autism, fewer were aware of associated abnormal eating habits (51.3%), persistent preoccupation with objects (58.3%), and love for regimented routine activities (48.3%).Domain IV, addressing disorder classification and comorbidities, revealed that 71.0% of students correctly identified autism as a neurodevelopmental disorder, and 79.7% recognized its possible association with mental retardation. However, misconceptions were evident as 80.0% incorrectly identified autism as childhood schizophrenia, and 42.0% wrongly classified it as an autoimmune condition. About half (49.7%) were aware of the possible association with epilepsy, while 68.7% correctly identified the typical age of onset as between 2-4 years.

Table 2. Distribution of knowledge of final year medical students regarding autism

Knowledge	Yes n (%)	No n (%)
Regarding impairment in social interaction in children with autism (Domain I)		
Children with autism have marked impairment in use of multiple non-verbal behaviors such as eye to eye contact, facial expression, body posture and gestures during social interaction?	248 (82.7)	52 (17.3)
Children with autism fail to develop peer relationship appropriate for developmental age?	254 (84.7)	46 (15.3)
There is lack of spontaneous will to share enjoyment, interest or activities with other people in autism?	201 (67.0)	99 (33.0)
Children with autism have less social or emotional reciprocity?	249 (83.0)	51 (17.0)
They stare into open space and don't focus on any-thing specific?	220 (73.3)	80 (26.7)
The child can appear as if deaf or dumb?	238 (79.3)	62 (20.7)
They lose interest in the environment and surroundings?	243 (81.0)	57 (19.0)
Social smile is usually absent in a child with autism?	251 (83.7)	49 (16.3)
Regarding impairment in communication and language development in autism (Domain II)		
There is delay or total lack of development of spoken language in children with autism	239 (79.7)	61 (20.3)
Regarding obsessive compulsive pattern of behavior in children with autism (Domain III)		
Children with autism have stereotyped and repetitive movement (e.g. hand or finger flapping or twisting)?	218 (72.7)	82 (27.3)
In autism child may have abnormal eating habit?	154 (51.3)	146 (48.7)
They may have persistent preoccupation with parts of objects?	175 (58.3)	125 (41.7)
Autistic children have love for regimented routine activities	145 (48.3)	155 (51.7)
Regarding information on what type of disorder autism is and possible comorbidities (Domain IV)		
Autism is childhood schizophrenia	240 (80.0)	60 (20.0)
Autism is an auto-immune condition	126 (42.0)	174 (58.0)
Autism is a neuro-developmental disorder	213 (71.0)	87 (29.0)
Autism could be associated with mental retardation	239 (79.7)	61 (20.3)
Autism could be associated with epilepsy	149 (49.7)	151 (50.3)
Onset of autism is usually within 2-4 years	206 (68.7)	94 (31.3)

Analysis of mean knowledge scores showed that participants scored highest in Domain I (6.34 ±1.73 out of 8), followed by Domain IV (3.47 ±1.51 out of 6), Domain III (2.30 ±1.25 out of 4), and Domain II (0.79 ±0.40 out of 1). The total mean knowledge score was 12.92 ±3.24 out of a possible 19 points (Table 3).

Table 3. Average knowledge scores among participants

Variable*	Mean ±SD
Domain I	6.34 ±1.73
Domain II	0.79 ± 0.40
Domain III	2.30 ±1.25
Domain IV	3.47 ±1.51
Total	12.92 ± 3.24

*Maximum total score for domain I, II, III, IV and total are 8, 1, 4, 6 and 19, respectively.

Amongall, 86.30%had gotknowledgeaboutautismfromtelevision,80.30%fromnewspaper,80.30%got frominternet,67.70%frompeer,60.00%fromlectures,58.70%fromjournals, 56.0%fromseminar,48.70%fromtextbookand47.30%gotknowledgefrom hospital admitted patients (Figure 1).

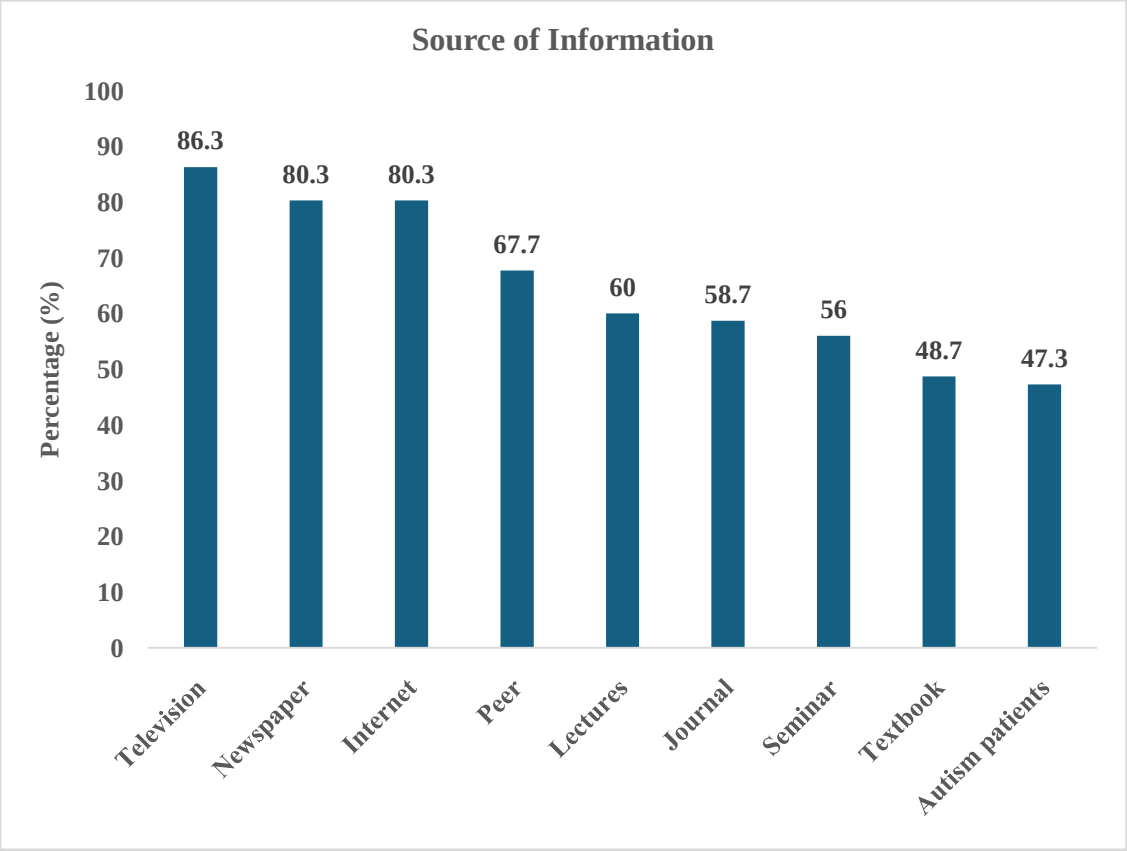

Figure 1. Sources of information

Discussion

This study assessed knowledge about autism among final year MBBS students in Bangladesh, revealing several important findings. The overall mean knowledge score was 12.92 ±3.24 out of 19 possible points, which is comparable to studies from other developing countries. A similar study in Pakistan found a mean score of 12.30 ±4.71 (Shaukat et al., 2014), while a Nigerian study reported a mean score of 12.24 ±3.24 among medical students (Bakare et al., 2009).

Regarding knowledge of social interaction impairments (Domain I), students demonstrated good understanding, with over 80% correctly identifying key features such as impaired non-verbal behaviors (82.7%), failure to develop peer relationships (84.7%), and absence of social smile (83.7%).A higher proportion of correct responses in these questions (90.3%, 89.3%, & 91%, respectively)were observed among family medicine residence in Saudia Arabia (Masarit *et al.*, 2022).The domain I score of the present study (6.34±1.73) was slightly higher than that found in India (5.56±1.79) (Ellias and Shah, 2019) and Nigeria (5.80 ±1.90)(Bakare *et al.*, 2009).

In Domain II, which assessed knowledge about communication impairments, 79.7% of students correctly identified that children with autism experience delay or lack of spoken language development. Which is higher than that found in the Saudi Arabian study (77.7%) (Masarit *et al.*, 2022). The mean score of 0.79 ±0.40 was also higher than that found in India (0.64±0.48)(Ellias and Shah, 2019).

The study revealed notable knowledge gaps in Domain III, which assessed understanding of stereotyped and repetitive behaviors. While 72.7% of students recognized stereotyped movements, fewer identified abnormal eating habits (51.3%). In comparison, among Saudi Arabian family medicine residents, 81.16% recognized the former that is higher than this study, while 41.7% identified abnormal eating habits as a behavior in children with ASD (Masarit *et al.*, 2022).The mean score of domain III (2.30 ±1.25) was again slightly higher than that found among Indian medical students (2.06 ±1.23)(Ellias and Shah, 2019)and that found among Nigerian healthcare workers (2.20 ±0.90)

Concerning disorder classification and comorbidities (Domain IV), significant misconceptions were evident. Notably, 80% of students incorrectly identified autism as childhood schizophrenia, much higher than the 3.9% misconception rate found in other studies(Masarit *et al.*, 2022). However, 71% correctly identified autism as a neurodevelopmental disorder, and 79.7% recognized its possible association with mental retardation. These proportions were higher than that found among Saudi Arabian physicians 46.6% and 36.9%, respectively(Masarit *et al.*, 2022). But the average domain score was lower than that reported by the Indian study(Ellias and Shah, 2019) and the Nigerian study(Bakare *et al.*, 2008).

We noted that the study findings were mostly comparable to other studies. However, the slight differences found among these studies using the same instrument to assess knowledge regarding childhood ASD could be due to the study population selected. As some were healthcare workers, while others were final year medical students.

Regarding the source of information, we noted a dominance of print and electronic media as a source of information regarding Autism among medical students. This indicates that special emphasis should be given in the textual and practical learning of the problem for medical students, as it is an increasingly common phenomenon around the world.

Limitations

The study faced several methodological constraints. The primary limitation was the lack of a locally validated assessment tool, necessitating the use of a modified Nigerian questionnaire (KCAHW). While the questionnaire was modified according to local context following a pilot study, it only provided a point assessment of knowledge and did not explore etiological understanding or cultural beliefs about autism. Additionally, the self-administered nature of the questionnaire, while efficient, could not ensure that responses were entirely independent of external influences.

Conclusion

Final year MBBS students in Bangladesh demonstrated reasonable overall knowledge about autism, particularly regarding social interaction impairments and communication deficits. However, significant knowledge gaps exist in understanding behavioral patterns and comorbidities, with notable misconceptions about autism's relationship to childhood schizophrenia. These findings highlight the need for enhanced medical education regarding autism spectrum disorders, particularly focusing on behavioral manifestations and comorbid conditions. Future curriculum development should address these identified knowledge gaps to better prepare medical students for identifying and managing autism in clinical practice.

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