Original Research Article

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20203363

Socioeconomic characteristics of autistic children: a comparative study

Zoshita Hamid, Sarmin Sultana, Saika Nizam, Rabeya Yasmin, M. H. Faruquee, Sk Akhtar Ahmad*

Department of Occupational and Environmental Health, Bangladesh University of Health Sciences (BUHS), Dhaka, Bangladesh

Received: 08 May 2020 Revised: 12 June 2020 Accepted: 16 June 2020

*Correspondence: Dr. Sk Akhtar Ahmad, E-mail: anon@bdcom.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Prevalence of autism is increasing and growing as an important public health problem. Prevention of autism is still a complicated issue. Thus, the management and rehabilitation of autistic children socially could be the main option. For which the role of socio-economic factors of the autistic children needs to be considered.

Methods: This was a cross-sectional comparative study conducted among the autistic and non-autistic children to compare their socioeconomic characteristics. A total of 90 autistic children from two specialized schools and age-matched 180 non-autistic children from nearby schools were included in this study.

Results: Overall the mean age of the children was 8.01 ± 2.974 years. More than fourth-fifths (84.4%) of the autistic children were male. In comparison to non-autistic children, significantly (p<0.05) autistic children had small family size (4.79) and higher family income (Taka=34588). Higher education of both father and mother was also found to be significantly associated with autistic children. However, logistic regression analysis revealed that post-graduate education of the father had the strongest (6.4 times) ability to predict the occurrence of autism. The mean age of the mother at birth of autistic children was significantly higher (31.16 years) and logistic regression analysis revealed that higher age of the mother at birth had 1.3 times ability to predict the occurrence of autism. Moreover, the analysis revealed that mothers who were housewife 2.3 times more likely to predict the occurrence of autism.

Conclusions: The study revealed that some socio-economic factors were significantly related to autistic children compared to those of non-autistic children.

Keywords: Autism, Autistic, ASD, Birth order, Higher education, Housewife, Socioeconomic

INTRODUCTION

Autism was first described as a severe case of schizophrenia by a German psychiatrist Eugen Bleuler in 1911. He defined Autism as the subject's symbolic inner life which was not easily accessible by observers. Later Autism was completely transformed and used to describe the child development and defined as a lifelong, complex non-progressive neurological and developmental disorder typically appears during early childhood, usually before three years of age.^{1,2} The word autism indicates a

developmental disability, significantly affecting verbal and non-verbal communication and social interaction which can affect a person's social skills, communication, relationships, and self-regulation. Autism is a spectrum disorder; it includes a certain set of behaviors, affects people differently and to varying degrees. Autism spectrum disorder (ASD) is a diverse neurodevelopmental condition characterized by repetitive or stereo behaviors and impairments in social behavior, communication, and interactions. Intellectual functioning in ASDs person is extremely variable and may have other co-morbid conditions, including epilepsy, anxiety, depression, and attention disorder.²⁻⁵

Studies suggested various factors including environmental and genetic factors that may cause a child to develop autism.⁴⁻⁶ The role of genetic factor has been mentioned as one of the important risk factors that likely to develop ASD. Consanguineous marriage and heredity are regarded as the common factor for the development of Autism among the offspring.⁶⁻⁸ Studies on environmental factors reported some environmental toxicant to have a link in the development of ASD. Some of these toxicants are pesticides, phthalates, PCBs, solvents, toxic substances in waste, air pollutants, and heavy metals. Drugs like valproic acid and thalidomide if taken during pregnancy also reported causing a higher risk of developing ASD.7-9

It has been reported that globally one in 160 children has an ASD and the estimated median prevalence of ASD was $62/10,000.^{5,10}$ According to CDC's estimation ASD has been identified about 1 in 54 children and is more than 4 times common among the boys than that of the girls. In Asia, Europe, and North America the average prevalence of ASD has been identified between 1% and 2% of the individuals, while in India the prevalence was 10/10,000 (0.15%) and was higher among the children in rural areas.^{6,11,12} In Bangladesh, about 17 per 10,000 children (0.17%) are reported to be autistic and a total of 18 lakh children has been identified as autistic. The prevalence of Autism was found to be higher among the boys than girls and more common in urban areas of Bangladesh.¹³

The occurrence of autism among the children is increasing worldwide, despite the race, ethnicity or socioeconomic status. The prevalence of autism in Bangladesh is though low compared to other countries but having an increased tendency of occurrence and becoming an important public health issue. Understanding of Autism in the community is a more socioeconomical problem than a medical problem. The community has a negative attitude towards autism and consider as a financial burden of the family and a social barrier; regarded as mental illness (Pagla) and believe as God-given curse. People do not want to spend much on the rehabilitation of autistic children.^{6,13,14} If autism is not addressed properly considering the sociocultural context, it will create a more social and economic burden in the community and in the country as well. To protect and to promote the management and rehabilitation of autistic children the socioeconomic factors should be given priority rather than addressing the causative factors. This study was an attempt to find out the socioeconomic characteristics of autistic children which can be utilized to undertake accessible and affordable management and rehabilitation measures for the autistic children.

METHODS

This was a cross-sectional comparative study conducted among the autistic and non-autistic children. The autistic children from two specialized schools (school for autistic children) located in Gulshan and Mirpur, Dhaka and nonautistic children from nearby schools (excluding English medium school) were included in the study. The nonautistic children were included as a comparative group. For each autistic child, two age-matched (±1 year) nonautistic children were selected. Ultimately a total of 90 autistic children and 180 non-autistic children were selected for this study. Either father or mother who was present during the data collection period was interviewed face to face by using a pretested questionnaire. Permission from the school authority was also sought to include their student in the study and to collect some related information from the school records. Data were collected from February to April 2019.

Inclusion criteria

Parents of the children aged >3 years and <15 years and who gave the consent to participate in the study were included in the study.

Exclusion criteria

Parents who were not available in the schools during the data collection period after repeated request and whose children were not co-operative were excluded from the study.

Statistical analysis

Statistical analysis of the collected data was done using the Statistical Package for Social Science (SPSS). Descriptive analysis of the variables was presented in frequency, percent and mean±standard deviation. For inferential statistics, Chi-square was done for univariate analysis between two categorical variables and t-test was done for computing differences between continuous and categorical variables. Finally, binary logistic regression was performed to test the association between autistic and non-autistic and socio-economic factors. Variables which were found significant in univariate test were included in the logistic regression.

A p value of less than 0.05 was considered as statistical significance ethical clearance of this study was taken from the Institutional Review Board (IRB) of the Bangladesh University of Health Sciences (BUHS), Dhaka. Parents of the participating students were assured that the information provided by them would not be disclosed. The parents were also encouraged to provide the truthful information and were informed that they have the autonomy to withdraw from the study at any time and their participation was voluntary. Necessary permission was also taken from the respective school authority.

RESULTS

Of the total 270 students, 90 students were autistic and the remaining 180 were non-autistic children for comparison. Overall, the mean age of the students was 8.01 ± 2.974 years and there was no significant difference in the mean age of autistic (8.37 ± 2.951 years) and nonautistic children (7.83 ± 2.978 years). More than half (53.3%) of the students were in the age group 6 to 10 years. Almost two-thirds (65.2%) of the participant students were male, and among the autistic children, male children were significantly ($\chi^2=22.068$; p=0.000) higher (84.4%). The mean family size of the autistic children (4.79 ± 1.913) was significantly (t=-3.722; p=0.000) less than that of non-autistic children (5.49 ± 2.284) and a higher proportion of the family size (55.6%) of autistic children was up to four (Table 1).

The mean age of the mother and father of the participant students was 37.69±5.676 years and 43.91±5.092 years respectively. Among the autistic children, the mean age of their mother (39.52±4.972 years) was significantly (t=3.842; p=0.000) higher than that of non-autistic children (37.69±5.676) but there was no significant difference in the mean age of their father. Regarding the educational status of the parents, it was found that a higher proportion of the father and mother of autistic children had postgraduate and graduate education (54.4% and 50.0% respectively). On the other hand, a higher proportion of father and mother of non-autistic children had a graduate level of education (51.1% and 55.2% respectively). The difference in the educational background of the parents of autistic and non-autistic children was statistically significant (χ^2 =37.099; p=0.000 and χ^2 =22.104; p=0.008 respectively) (Table 2).

	Table 1	: Distribution	of studied	children by	age, sex and	family size.
--	---------	----------------	------------	-------------	--------------	--------------

Variables	Autism (n=90)	tism (n=90) Non-autism (n=180)		Test of significance	
variables	N (%)	N (%)	N (%)		
Child (years)					
Upto 5	18 (20.0)	45 (25.0)	63 (23.3)		
6-10	49 (54.4)	95 (52.8)	144 (53.3)	χ ² =0.960; p=0.619	
Above10	23 (25.6)	40 (22.2)	63 (23.3)		
Mean±SD	8.37±2.951	7.83±2.978	8.01±2.974	t=1.392; p=0.165	
Sex					
Female	14 (15.6)	80 (44.4)	94 (34.8)	-2 22 0 C2 = 0 000	
Male	76 (84.4)	100 (55.6)	176 (65.2)	χ ⁻ =22.068; p=0.000	
Family size					
Upto 4	50 (55.6)	53 (29.4)	78 (28.2)		
5	22 (24.4)	52 (28.9)	74 (27.4)	χ ² =19.333; p=0.000	
6 and above	18 (20.0)	75 (41.7)	93 (24.4)		
Mean±SD	4.79±1.913	5.85±2.374	5.49±2.284	t=-3.722; p=0.000	

Table 2: Distribution of parents by their age and education.

Variables	Autism (n=90)	Non-autism (n=180)	Total (n=270)	Test of significance	
variables	N (%)	N (%)	N (%)		
Mother age in years					
22-30	3 (3.3)	24 (13.6)	27 (10.1)		
31-40	53 (58.9)	120 (67.8)	173 (64.8)	χ ² =13.881; p=0.001	
41-50	34 (37.8) 36 (20.0)		67 (25.1)		
Mean±SD	39.52±4.972	36.77±5.795	37.69±5.676	t=3.842; p=0.000	
Father age in years					
30-40	15 (16.7)	60 (33.3)	75 (27.8)		
41-50	67 (74.4)	104 (57.8)	171 (63.3)	χ ² =8.632; p=0.013	
51-60	8 (8.9) 16 (8.9)		24 (8.9)		
Mean±SD	44.72±4.924	43.50±5.139	43.91±5.092	t=1.868;p=0.063	
Father's education					
Post graduate	49 (54.4)	33 (18.3)	82 (30.4)		
Graduate	31 (34.4)	107 (68.3)	138 (51.1)	χ ² =37.099; p=0.000	
HSC and above	10 (11.2)	40 (22.2)	50 (18.5)		
Mother's education					
Post graduate	31 (34.4)	21 (11.7)	52 (19.3)		
Graduate	45 (50.0)	104 (57.7)	149 (55.2)	$\chi^2 = 22.104; p = 0.000$	
HSC and above	14 (15.6)	55 (30.6)	69 (25.5)		

Variables	Autism (n=90)	Autism (n=90) Non-autism (n=180)		Test of significance	
variables	N (%)	N (%)	N (%)		
Father					
Service	45 (50.0)	124 (68.9)	169 (62.6)		
Business	21 (23.3)	35 (19.4)	56 (20.7)	$\chi^2 = 11.958; p = 0.003$	
Professional	24 (26.7)	21 (11.7)	45 (16.7)		
Job experience (year) 18.82±4.057 17.98±3.57		17.98±3.570	18.26±3.752	t=1.726; p=0.085	
Mother					
House wife	65 (28.5)	163 (71.5)	228 (84.4)	χ ² =15.352; p=0.000	
Working mother	25 (59.5)	17 (40.5)	42 (15.6)		
Job Experience (year)	erience (year) 11.32±2.887 10.95±3.347		11.13±3.001	t=3.288; p=0.002	
Monthly income					
Up to 15000	17 (18.9)	42 (23.3)	59 (21.9)		
16-30000	11 (12.2)	67 (37.2)	78 (28.9)	$u^2 - 26 209$, $m = 0.000$	
31-45000	35 (38.9)	20 (11.1)	55 (20.4)	- χ-=30.308; p=0.000	
>45000	27 (30.0)	51 (28.3)	78 (78.9)		
Mean±SD (Taka)	34588±14367	27333±17195	29751±16636	t=3.446;p=0.001	

Table 3: Distribution of the parents by their occupation and income.

Table 4: Distribution of studied child by birth order and siblings.

Birth order and siblings	Autism (n=90)	Non-autism (n=180)	Total (n=270)	Test of significance	
birtii oruer anu sibilligs	N (%)	N (%)	N (%)		
Birth order					
1 st	47 (52.2)	136 (75.6)	183 (67.9)	$v^2 - 14.058 = 0.000$	
2 nd	43 (47.8)	44 (24.4) 91 (32.2)		χ =14.936,p=0.000	
Siblings					
0	24 (26.7)	25 (13.9)	49 (18.1)		
1	53 (58.9)	119 (66.1)	172 (63.8)	χ ² =6.910; p=0.032	
2 and above	13 (14.4)	36 (20.0)	49 (18.1)		

Table 5: Distribution of parents' demographic characteristics before the birth of studied children.

Douonta' about out istics	Autism (n=90)	Non-autism (n=180)	Total (n=270)	Test of significance	
Farents characteristics	N (%)	N (%)	N (%)		
Father's age (years)					
Up to 30	11 (12.2)	33 (18.3)	44 (16.3)		
31-40	62 (68.9)	116 (64.4)	178 (65.9)	χ ² =1.649; p=0.439	
41 +	17 (18.9)	31 (17.2) 48 (17.8)			
Mean±SD	36.36±4.931	35.67±5.468	35.89±5.296	t=1.088; p=0.315	
Mother's age (years)					
<25	7 (7.8)	40 (22.2)	47 (17.4)		
25-34	61 (67.8)	111 (61.7)	172 (63.7)	χ ² =9.749; p=0.008	
35+	22 (24.4)	29 (16.1)	51 (18.9)		
Mean±SD	31.16±4.813	28.94±6.038	29.67±5.74	t=3.003; p=0.003	
Mother's job					
House wife	58 (64.4)	155 (86.1)	213 (78.9)	$x^2 - 10.013$; p=0.001	
Working mother	32 (35.6)	25 (13.9)	57(21.4)	χ =10.915; p=0.001	
Father's experience					
Mean±SD (years)	10.46±3.329	10.16±2.423	.16±2.423 10.26±2.423		
Mother's experience					
Mean±SD (years)	2.45 ± 2.089	3.00±2.333	2.72±2.199	t=-0.776; p=0.4429	

The occupation (Table 3) of a higher proportion of the father of both autistic (50.0%) and non-autistic children (68.9%) was service followed by business (19.4%) among non-autistic children and professional occupation (26.7%) among autistic children. The professional occupation was the engineer, advocate and physician. The difference in the occupation of the father of autistic (50.0%) and nonautistic children were significantly different (χ^2 =11.958; p=0.003). On the other hand, majority of the mother of both autistic (72.2%) and non-autistic (90.6%) children were housewife. However, the working mother was significantly (χ^2 =15.352; p=0.000) higher among the autistic children (27.8%) than that of non-autistic children (9.4%). The autistic children significantly (χ^2 =36.308; p=0.000) had a higher range of monthly family income (Taka 31000/- and above) than that of non-autistic children. However, the mean monthly income of the family of autistic children was Taka=34588±14367 and that of non-autistic children was Taka=27333±17195, and the difference was statistically highly significant (t=3.446; p=0.001) (Table 3). Table 4 shows the distribution of studied children by birth order and siblings. According to birth order, the majority of the autistic children (52.2%) and non-autistic children (75.6) were in the first position and the difference was statistically significant (χ^2 =14.958; p=0.000). Almost two-thirds (63.8%) of the studied children had one sibling and comparatively one sibling was significantly $(\chi^2=6.910; p=.032)$ more frequent in non-autistic children (66.1%).

Table 5 shows that distribution of parents' demographic characteristics before the birth of studied children. The

mean age of the father $(36.36\pm4.931$ years) of the autistic children before their birth was found higher than those of non-autistic children but significantly not different. However, the mean age of mother $(31.16\pm4.813$ years) of autistic children was found significantly (t=3.003; p=.003) higher compared to that of non-autistic children (28.94 ± 6.038) . Further, it was found that only 7.8% of the mother of autistic children was below 25 years of age and remaining were more than 25 years. Regarding the occupation of the parents, it was found that almost all the father continuing the same occupation which was before the birth of studied children. However overall, 21.4% of the mothers were working mother and among the mother of autistic children more than three-fourths (35.6%) were working mother.

Among the mother of non-autistic children, most (86.1%) of them were housewife. The difference in mother's job between autistic and non-autistic children was statistically significant (χ^2 =10.539; p=0.001). The duration of the job of both father and mother of autistic and non-autistic children before their birth had no significant difference. Logistic regression analysis (Table 6) was performed to predict the likelihood of occurrence of autism, the influence of family income, family size, educational status, age and occupation of father and mother before the birth of studied children, and the birth order were analyzed (Table 6). The combined effects of these predictors could significantly (χ^2 =81.404; p=0.000) able to explain the development of autism. The analysis revealed that independently the father of the studied children who had post-graduate education, significantly (p=0.024) 6.4 times more likely to develop autism.

Dependent variables: Autism stat			95% confidence interval				
Independent variables	В	S.E.	Wald	Sig.	Exp (B)	Lower	Upper
Constant	-1.067	1.179	0.819	0.366	0.344		
Father education- HSC			6.311	0.043			
Father education- gradaute	0.901	0.745	1.461	0.227	2.462	0.571	10.610
Father education- post graduate	1.856	0.822	5.097	0.024	6.399	1.277	32.058
Mother education- HSC	0.309	0.596	0.269	0.604	1.362	0.424	4.380
Mother education-graduate	-0.293	0.756	0.151	0.698	0.746	0.170	3.280
Mother education- post graduate	0.901	0.745	1.461	0.227	2.462	0.571	10.610
Family income	0.000	0.000	0.055	0.814	1.000	1.000	1.000
Birth order- first	1.385	0.376	13.579	0.000	3.3995	1.912	8.345
Family size- 4			8.313	0.016			
Family size- 5	-0.530	0.370	2.049	0.152	0.589	0.285	1.216
Family size- 6	-1.120	0.392	8.177	0.004	0.326	0.151	0.703
Father occupation- service			1.106	0.575			
Business	0.133	0.462	0.083	0.773	1.143	0.462	2.827
Professional	0.472	0.453	1.089	0.297	1.603	0.660	3.892
Mother occupation- housewife	0.818	0.398	4.236	0.040	2.267	1.040	4.941
Father age before child birth	-0.211	0.077	7.515	0.006	0.810	0.697	0.942
Mother age before child birth	0.217	0.076	8.098	0.004	1.243	1.070	1.444

Table 6: Logistic regression predicting likelihood of development of autism.

 $\chi^2 = 81.404$; p=0.000.

However, the education of the mother was a nonsignificant predictor. But the age of the mother before the childbirth was a positive and significant (p=0.002) predictor and indicating that every one-year increase in mother age the likelihood of developing autism increased by 1.3 times. On the other hand, that the age of the father was a negative and significant (p=0.003) predictor and indicating that every one-year increase of father age the probability of developing autism increased by 0.79 times, inversely the probability of development of autism decreased by 1.25 times. Further, the analysis revealed that the housewife mother was a significant (p=0.04)predictor of autism and 2.3 times more likely to developing autism than, working mother. On the other hand, it was found that the occupation of the father was a non-significant predictor for autism. The first birth order of the studied children was found to be a significant (p=0.000) predictor and had 3.4 times more ability to predict the likelihood of occurrence of autism. Regarding the family size, the analysis revealed that more the family size (6 and above) significantly (p=0.004) 0.33 times less the ability to predict the likelihood of developing autism than the lesser family size.

DISCUSSION

Since the 1960s the concept of autism has been transformed from the psychological aspect to neurodevelopmental disorders. Last few decades various researches have been done on autism to find out its etiological factors, determinants, recognition features, social and cultural understanding and issues; and the role of environmental and genetic factors, as a result, significant advances have been developed in the comprehensive care including the early diagnosis of autism. However, the prevalence of autism is increasing, the families and the community facing the big challenges and implies as a social and financial burden, despite the intensive activities on awareness and social responses done in the recent past. On the other hand, the exact etiology of the autism is still not clear, the genetic and environmental factors in the causation remain to be understood completely.^{1,4-7,15} Thus, for early and effective interventions for the management of autism at family as well as at the community level, in this study the nongenetic risk factors particularly the socioeconomic factors have been assessed.

Several epidemiological studies have been conducted in Bangladesh and elsewhere to find out the potential socioeconomic risk factors for autism.^{6,12-16} In the current study also a number of socioeconomic factors were found to be significantly associated with the occurrence of autism while comparing those factors with non-autistic children. Most of the autistic children of the studied specialized schools participated in this study and it was found that more than fourth-fifths of them were male. In different studies also autism was more frequently found among male compared to female but the difference was small.^{6,10,14-16} In this study, the difference in the proportion of male and female was large, which was also found in another study, might indicate a gender disparity to bring the female autistic children to the specialized school.¹⁷

Logistic regression analysis revealed that among the socioeconomic predictors, the father having a postgraduate level of education independently had the strongest (6.4 times) ability to predict the likelihood of developing autism. Though the mother with higher education was not a significant predictor but was found to be significantly associated with the autistic children. Studies elsewhere also revealed that autism was more common among the children whose parents had higher education.^{6,13,17} However, in a study it was found that mothers of autistic children were less educated than that of the father.¹⁸ In the current study, most of the mothers were found to be a housewife and the analysis revealed that independently housewife had a strong (2.3 times) ability to predict the occurrence of autism than the mothers who were working mothers. This study further revealed that more than one-fourth of the father of autistic children had professional occupation which includes engineering, physician and advocates and similarly more than one-fourth of the mothers were working mother. Studies conducted elsewhere in relation to the occupation of the parents of autistic children revealed that the autistic children were more frequent among the parents who had technical jobs like engineering, physician and accounts.¹⁹⁻ ²¹ Nonetheless, in a study, it was also reported that onethird of the mothers of autistic children were homemaker.¹⁹ Regarding the age of the mothers at birth, this study found that the birth of autistic children was significantly more frequent with the higher age of the mother. The logistic regression analysis revealed that mother with higher age had 1.3 times more ability to predict the occurrence of autism than that of the mother who had a lower age at birth. In the studies, it was also reported that higher the age of mother, more the chance of occurrence of autism.^{6,7,13} On the other hand, the current study revealed that the father with an increased age had less ability to predict the development of autism, which requires further investigation. Regarding the birth order of the children, the current study revealed that the autism was significantly more frequent in the first birth order and among one sibling. The logistic analysis revealed that the first birth order had a strong (3.4 times) ability than that of second birth order to predict the likelihood of developing autism. In the studies, also the autistic children were reported to be more common in the first birth order but the role of birth order in developing autism yet to be clearly understood.^{6,22-24}

Limitations

The sample size was not calculated because of the small number of autistic children in the schools. Thus, on the basis of criteria, the convenient sampling method was used to include the parents of both autistic and nonautistic children. Occupations of the parents were diverse and some small in number for which the occupations were combined to make that valid for statistical analysis. The parents particularly the mother had a tendency to conceal their age. However, that was overcome to some extent by cross-checking the mothers.

CONCLUSION

The study revealed that parents with higher educational background, higher monthly income, small family size, housewife and higher age of mother at birth independently had strong likelihood in developing autistic children in comparison to those of non-autistic children. Moreover, it was found that autistic children were more frequent with first birth order and one sibling.

Funding: No funding sources

Conflict of interest: None declared Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- 1. Evans B. How autism became autism: the radical transformation of a central concept of child development in Britain. History Human Sci. 2013;26(3):3-31.
- 2. Autism awareness. Definition of autism. Available at: https:// autism awareness centre. com/ definition-autism. Accessed on 21 January 2020.
- 3. Autism Society. What is autism. Available at: https:// www.autism-society.org/what-is/. Accessed on 21 January 2020.
- 4. Faras H, Ateeqi NA, Tidmarsh L. Autism spectrum disorders. Ann Saudi Med. 2010;30(4):295-300.
- 5. WHO. Autism spectrum disorders. Available at: https://www.who.int/news-room/fact-sheets/ detail/ autism- spectrum-disorders. Accessed on 21 January 2020.
- Bhuiyan MR, Islam MZ, Rafi A, Kawsar AA, Akhtar K. Socio-demographic characteristics and related factors affecting children with autism spectrum disorder. JAFMC Bangladesh. 2011;13(1):56-61.
- Lyall K, Croen L, Daniels J, Fallin MD, Acosta CL, Lee BK, at el. The changing epidemiology of autism spectrum disorders. Annu Rev Public Health. 2017;38:81-102.
- 8. Goldani AAS, Downs SR, Widjaja F, Lawton F, Hendren RL. Biomarkers in autism. Frontiers Pshchiatry. 2014;5:1-13.
- 9. Rossignol DA, Genuis SJ, Frye RE. Environmental toxicants and autism spectrum disorders: a systematic review. Transl Psychiatry. 2014;4:1-23.
- Elsabbagh M, Divan G, Koh YJ, Kim YS, Kauchali S, Marcín C, at el. Global prevalence of autism and other pervasive developmental disorders. Autism Res. 2012;5:160-79.
- 11. CDC. Data and statistics on autism spectrum disorder. Center for disease control and prevention.

Available at: https:// www. cdc. gov/ ncbddd/ autism/data.html. Accessed on 21 January 2020.

- 12. Raina SK, Chander V, Bhardwaj AK, Kumar D, Sharma S, Kashyap V, at el. Prevalence of autism spectrum disorder among rural, urban, and tribal children (1-10 years of age). J Neurosci Rural Pract. 2017;8:368-74.
- New Age-17 in 10,000 children autistic. Available at: https://www. newagebd. net/ article/ 45831/ 17in-10000- children-autistic. Accessed on 21 January 2020.
- 14. Bhuiyan MR, Hossain SMM, Islam MZ. Financial burden of family for the children with autism spectrum disorder. Int J Med Health Sci. 2018;12(9):432-8.
- 15. Yang W, Xia H, Wen G, Liu L, Fu X, Lu J, Li H. Epidemiological investigation of suspected autism in children and implications for healthcare system: a mainstream kindergarten-based population study in Longhua District, Shenzhen. BMC Pediatrics. 2015;15:207.
- 16. Akhter S, Hussain AHME, Shefa J, Kundu GK, Rahman F, Biswas A. Prevalence of autism spectrum disorder (ASD) among the children aged 18-36 months in a rural community of Bangladesh: a cross sectional study. F Research. 2018;7:1-14.
- 17. Islam MS, Kanak F, Iqbal MA, Islam KF, Mamun AA, Uddin MS. Analyzing the status of the autism spectrum disorder amid children with intellectual disabilities in Bangladesh. Biomed Pharmacol J. 2018;11(2):689-701.
- 18. Afrin S, Akter MA, Akter A, Akhter T, Akhter S. Parental educational background and socio economic status of ASD children in Bangladesh. ARC J Psychiatry. 2017;2(4):9-14.
- Dickerson AS, Pearson DA, Loveland KA, Rahbar MH, Filipek PA. Role of parental occupation in autism spectrum disorder diagnosis and severity. Res Autism Spectr Disord. 2014;8(9):997-1007.
- 20. Windham GC, Fessel K, Grether JK. Autism spectrum disorders in relation to parental occupation in technical fields. Autism Res. 2009;2(4):183-91.
- 21. Wheelwright S, Cohen SB. The link between autism and skills such as engineering, maths, physics and computing. Autism. 2001;5:223-7.
- 22. Ugur C, Tonyali A, Goker Z, Uneri OS. Birth order and reproductive stoppage in families of children with autism spectrum disorder. Psych Clinic Psychopharmacol. 2018;29(4):509-14.
- 23. Halkola RK, Larsson H, Lundström S, Sandin S, Chizarifard A, Bölte S, at el. Reproductive stoppage in autism spectrum disorder in a population of 2.5 million individuals. Molecular Autism. 2019;10:45.
- 24. Martin LA, Horriat NL. The effects of birth order and birth interval on the phenotypic expression of autism spectrum disorder. PLoS ONE. 2012;7(11):e51049.

Cite this article as: Hamid Z, Sultana S, Nizam S, Yasmin R, Faruquee MH, Ahmad SA. Socioeconomic characteristics of autistic children: a comparative study. Int J Community Med Public Health 2020;7:2914-20.