

RESEARCH PAPER

A Case Control Study on Prevalence, Sleep Disorder & Life Style of Children with Autism of Bangladesh

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Abstract

Background: This research analyzes the sleeping conditions of children with autism spectrum disorder (ASD) and examines the relationship between common sleep disorders, core symptoms, and developmental phases.

Objectives: To investigate the prevalence, sleep disorder & life style of children with autism of Bangladesh.

Methods: This case-control study used qualitative and quantitative (Mix-Method) approaches. Sources were primary and secondary. The study conducted in 08 districts in Bangladesh such as Dhaka, Chittagong, Jassore, Mymensingh, Rajshahi, Rangpur, Barisal, Sylhet. This study included 400 school going children and the age group was within 3-12 years old and 200 children were from Autistic Spectrum Disorder and 200 children were from Traditionally Developed Children.

Results: In case group among the 200 respondents who were the guardian of the children of ASD highest (74%) were mother followed by (24.50%) were father and only (1.50%) were other like brother or sister. In control group (TDC) highest (71%) respondents were mother followed by (16.50%) were father and only (12.50%) were from other like sister or brother. Highest (58.50%) ASD children were within the age of 9 to 12 years and 32.50% were 6 to 8 years old. Only 9% were from (3 to 5) years old. In control group highest (58%) TDC were within the age of 9 to 12 years and 29% were 6 to 8 years old. Only 13% were from (3 to 5) years old. Highest (67%) were male and (33%) were female on the other hand in control group (54%) were male and (46%) were female. In case group, highest (50.50%) were classical autism and highest (69.00%) were referred for test. According to children's response to social response's in case group rarely response was 35%, sometimes response was 27.5%, often response was 14.0%, maximum time response was 11.5%, always response was 12.0%. Chi-Square Tests results shows that both slip duration and taking pill among ASD children and TDC are significant which indicate there is certain association of ASD and sleep disorder.

Conclusion: ASD Children have certain sleep disorder and challenging life style. Early detection by using effective diagnosis and test required for ASD. ASD children need special care with proper lifestyle management. This study observed that the ASD children have certain creativity especially in handicraft, art and cultural activities. Proper skill development training can improve their creativity. Therefore it is necessary to support them from all part of society.

Keywords: Prevalence, Sleep disorder, Life style, ASD

Introduction

Autism spectrum disorder, also known simply as ASD, is a form of developmental disability that can lead to substantial difficulties in social interaction, communication, and conduct. People with autism

spectrum disorder (ASD) frequently appear the same as other people in every other regard; nonetheless, they may communicate, interact, behave, and learn in ways that are significantly different from how most other people do these things. People who have autism spectrum disorder (ASD) can have talents in learning, thinking, and problem solving that range from gifted to severely impair. Some individuals diagnosed with ASD have a greater requirement for assistance in their day-to-day activities than others do.¹

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The population of the growing nation of Bangladesh is 167 million people, and it is located in Southeast Asia. According to a poll that was endorsed by the World Health Organization and conducted in 2009, 0.84 percent of youngsters suffer from diseases that fall under the autism spectrum. Despite the extent of the disease burden, the country only has 200 psychiatrists and a limited number of other types of health providers. Although Bangladesh has a very well developed three-tiered health care delivery system, autism treatment is only offered at the most advanced level of the pyramid. The community that lives in rural and semi-urban locations does not have access to the right assistance for their autistic children and adolescents. Care for autism needs to be incorporated into the nation's health service system from the very beginning, at the level of primary care, in order to reduce the severity of the condition and ensure that everyone has access to services that are coordinated with one another. Even medical professionals were unaware of the clinical characteristics of autism and its management, and they frequently lacked comprehension of the illness. Dhaka Shishu Hospital and other hospitals began providing services for autistic children as early as 1990. Subsequently, many other organizations, such as the Society for the Welfare of Autistic Children (SWAC), the Autistic Welfare Foundation (AWF), PROYASH, and others, began providing services for autistic children beginning in the year 2000 and moving forward.²

It is imperative that early detection of autism spectrum disorder (ASD) in children be improved since this paves the way for earlier intervention, which has been demonstrated to improve results in fundamental behavioral and skill deficiencies related to ASD. Researchers from the University of Waterloo led a new study in which they assessed how children with autism spectrum disorder (ASD) scan a person's face in a different way than a neuro-typical child does. The findings allowed the researchers to design a method that takes into account how the gaze of a child with ASD moves from one part of a person's face to another as they move from one feature to another. According to the people who developed this technology, the utilization of such technology makes the diagnostic process less stressful for the youngsters, and when combined with the traditional manual methods, it may assist medical professionals in better avoiding a false positive diagnosis of autism.³ The American Academy of Neurology currently recommends that children who

do not pass routine developmental exams be screened with either the Modified Checklist for Autism in Toddlers (M-CHAT) or the Autism Screening Questionnaire (ASQ). Both of these questionnaires and checklists are available online (now referred to as the Social Communication Questionnaire). Existing tools, on the other hand, can be administered in a variety of ways and have varying degrees of validity depending on how well they have been tested. Researchers are currently doing studies that compare pre-diagnostic video tapes of autism case subjects with control subjects, as well as closely observing cohorts of infant siblings of children diagnosed with autism, in order to discover more effective treatment methods.⁴

In underdeveloped nations, such as Bangladesh, the burden of childhood disabilities such as autism as a public health problem is still largely overlooked, despite the fact that the condition is all too widespread. The percentage of children who survive to adulthood in Bangladesh has dramatically increased in recent years.⁵ The amount of information that is known regarding the general condition of impaired children is embarrassingly low. Data on autism is harder to come by, and the difficulty of identifying the illness as a layperson only adds insult to injury. The main reasons for such a dearth of data on disability are a mix of social problems, technical considerations, and practical factors, which makes it exceedingly difficult to collect accurate data that can be used on a nationwide scale. In rural regions, there is a shortage of educated workers to conduct surveys of disability identification, which ultimately leads to a lesser knowledge of the incidence of autism. This is one of the practical challenges that exist.

There is no study that has been conducted in Bangladesh that has investigated the incidence of autism and the lifestyle of autistic children in Bangladesh, in addition to the predictive indicators for autism characteristics that are related with enrollment in sleep disorders. As a result, this study is going to be carried out in order to analyze the prevalence of autism in Bangladesh, as well as the risk factors, early warning signs, screening procedures, and therapeutic strategies associated with autism.

Materials and Methods

This is a case-control and comparison study, the nature of which is being investigated. In order to find the best potential conclusion, the qualitative and

quantitative approaches (Mix Method) have been utilized. Data were gathered from a variety of sources, including main and secondary ones. Secondary sources of data were collected from journal articles, books, newspaper reports, published and unpublished literatures, as well as websites for the government and non-governmental organizations (NGOs). Primary data were collected through surveys; focus group discussions, and key informant interviews (KID). Six months beginning on the date the approval was given.

The method of purposeful sampling was used for the research project. First, we have opened special schools for autistic children in eight of Bangladesh's divisional cities. As a result, a technique of sampling that is more convenient has been employed, and it has been based on the availability of patients according to the inclusion and exclusion criteria. Participating in the study will be a total of 200 young stars ranging in age from 3 to 12 years old that will be autistic and normal. The case group consisted of 200 children who were diagnosed with autism spectrum disorder as well as control children were comprised of 200 TDC. All of the characteristics of relevance to the study were incorporated into both structured and unstructured questionnaires, focus group discussions (FGD), key informant interviews (KID). Subjects were easily chosen to participate in the study based on inclusion and exclusion criteria, as well as the availability of instances. Through the use of a standardized questionnaire, we were able to acquire both a detailed history and clinical information. After gaining the assent of the informants, a case-control research was carried out using face-to-face interviews with the children, their parents, and their teachers, adhering to the criteria outlined previously. Discussions took place with the

children's parents and instructors regarding the objectives and methodology of the study, and informed written agreement was acquired from those individuals who agreed to take part in the research. A comprehensive socio-demographic profile as well as a clinical history was documented in a data sheet that had been predesigned. The Statistical Package for the Social Sciences version 23 (SPSS 23), Stata, and Microsoft Excel were utilized in order to carry out the statistical analysis. Tables, figures, and diagrams were used to present the study's findings when it was completed. The descriptive statistics of the study were provided in tables, figures, or appropriate graphs, as well as the mean and standard deviation, according to the requirements of the qualitative and quantitative variables. A comparison of the means of the two groups was carried out using the Student's t-test, and a value of 0.05 or less was deemed to be statistically significant.

Results

The study was carried out in the different autism school, autism therapy center and non-autistic school which was covered all 8 districts of Bangladesh including Dhaka, Chittagong, Jessore, Mymensingh, Rajshahi, Rangpur, Barisal, Sylhet. Beside survey Kits and FGDs also conducted Jessore, Mymensingh, among the 200 respondents who were the guardian of the children for the study. In case Disorder (ASD) were selected equally (12.5%) from each study area. Children of Autism Spectrum among the 200 respondents who were the guardian of Traditionally Devel. Similarly, in control group selected equally (12.5%) from each study area. The respondent's allocation is shown in table I.

Table I: District wise allocation of study sample (n=400)

Division	Case Group(ASD)		Control Group(TDC)	
	Frequency	Percent	Frequency	Percent
Barisal	25	12.5	25	12.5
Chittagong	25	12.5	25	12.5
Dhaka	25	12.5	25	12.5
Jessor	25	12.5	25	12.5
Maymanshing	25	12.5	25	12.5
Rajshahi	25	12.5	25	12.5
Rangpur	25	12.5	25	12.5
Sylhet	25	12.5	25	12.5
Total	200	100.0	200	100.0

In case group among the 200 respondents who were the guardian of the children of ASD highest (74%) were mother followed by (24.50%) were father and only (1.50%) were other like brother or sister. On the other hand, in control group (TDC) among the respondents highest (71%) were mother followed by (16.50%) were father and only (12.50%) were from other like sister or brother.

Table II: Distribution of socio demographic variable among the respondents (N=400)

Variables	ASD % (n = 200)	TDS % (n = 200)
Age Group		
3 to 5 Years	9%	13%
6 to 8 Years	32.50%	29%
9 to 12 Years	58.50%	58%
Sex		
Male	67%	54%
Female	33%	46%
Family Expenses of ASD		
<20000 tk	36%	32.50%
20000-50000 tk	49.50%	44%
>50000 tk	14.50%	23.50%
Blood Group		
O-	3 %	15 %
O+	29 %	20.5 %
A-	3 %	.5 %
A+	16 %	19 %
B-	4.5 %	1 %
B+	31.5 %	24 %
AB+	11 %	15.5 %
AB-	2 %	4.5 %

In table II shows that, among the 200 respondents highest (58.50%) ASD children were within the age of 9 to 12 years and 32.50% were 6 to 8 years old. Only 9% were from (3 to 5) years old. In control group among the 200 respondents highest (58%) TDC were within

the age of 9 to 12 years and 29% were 6 to 8 years old. Only 13% were from (3 to 5) years old. The age group frequency of both case and control group are almost similar. Besides, highest (67%) were male and (33%) were female on the other hand in control group (54%) were male and (46%) were female. On the other hand, 200 respondents highest (49.50%) respondents family expenses were (20000 to 50000) BDT followed by (36.50%) family income were <20000 BDT and (14%) respondents family income were >50000 BDT. On the other hand in control group highest (44%) respondents family income were (20000 to 50000) BDT followed by (32.50%) family income were <20000 BDT and (23.50%) respondents family income was >50000 BDT. Compare with the income level few families in both case and control group had savings.

The Control group family member's expenses are slightly higher than case group. According to blood group of case group 3% were O- while 29% were O+, 3% were A- while 16% were A+, 4.5% were B- while B+ were 31.5%, AB+ were 11% while AB- were 2%. Among control group 15% were O- while 20.5% were O+, A- were 0.5% while A+ were 19.0%, B- were 1% while B+ were 24%, AB+ were 15.5% while AB- were 4.5%. Chi-Square Tests results shows that both slip duration and taking pill among ASD children and TDC are significant which indicate there is certain association of ASD and sleep disorder. FGD and KII findings also show the similar results of survey. In addition there are certain gap in knowledge, attitude and practice among the ASD children. Also there are some negligence and misconnect of ASD children as they think this special children may not be support them in future and consider them as burden of society. Both parents and teachers need to give special care and attention to ASD children for their improvement of life style and sleep disorder.

Among the 200 ASD children in case group highest (50.50%) were classical autism. The other frequency is shown in figure 1.

Table III: Children's respond to social response (n=400)

Children's respondent to social response?	Case Group(ASD)		Control Group(TDC)	
	Frequency	%	Frequency	%
Rarely	70	35.0	20	10.0
Sometimes	55	27.5	17	8.5
Often	28	14.0	15	7.5
Maximum time	23	11.5	148	74.0
Always	24	12.0	200	100.0
Total	200	100.0	200	100.0

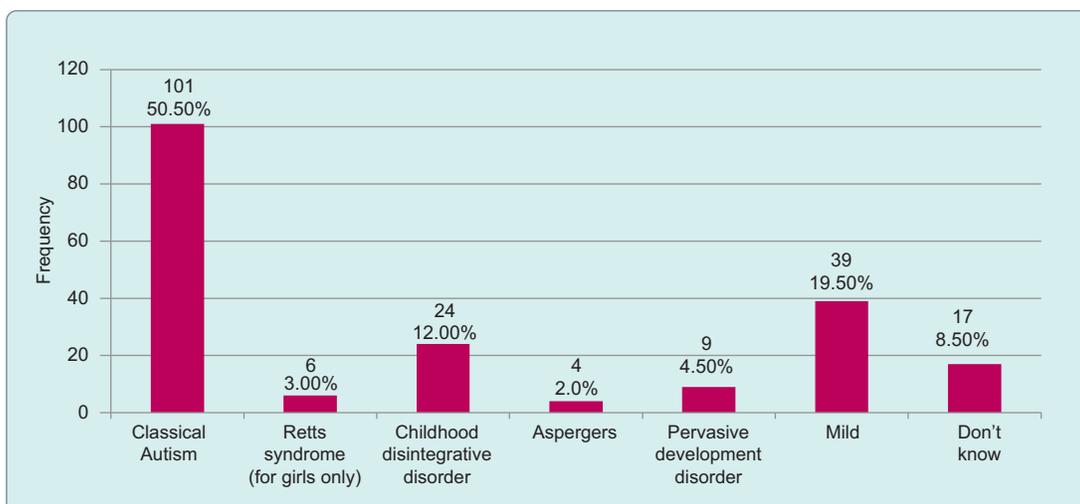


Figure 1: Types of ASD among the case group (n=200)

Among the 200 ASD children in case group highest (69.00%) were referred for test. The other referred test is shown in figure 2.

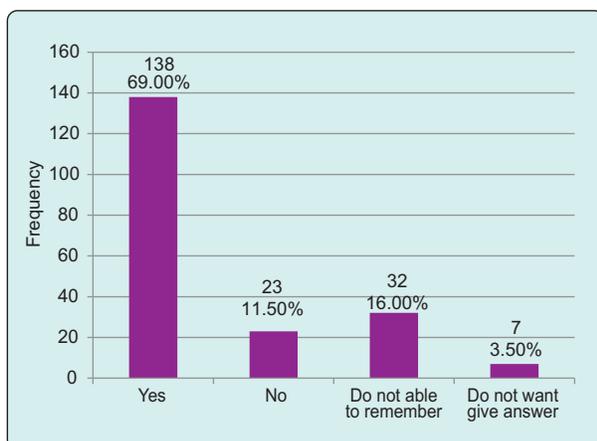


Figure 2: Doctor referred test for ASD children (n=200)

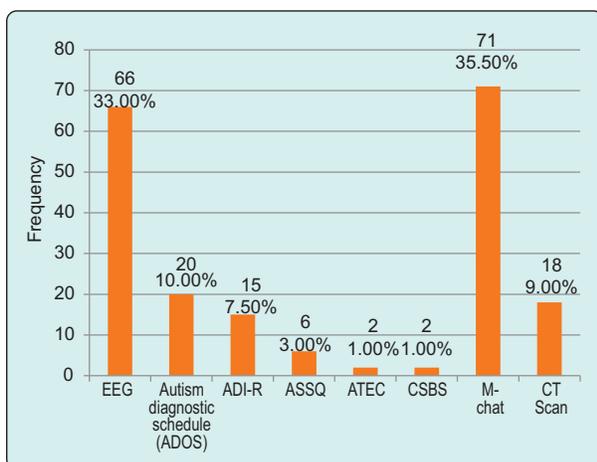


Figure 3: Type of test for ASD children (n=200)

According to children's response to social response's in case group rarely response was 35%, sometimes response was 27.5%, often response was 14.0%, maximum time response was 11.5%, always response was 12.0%. In control group rarely response was 10.0%, sometimes response was 8.5%, often response was 7.5%, maximum time response was 74.0% and always response was 100%.

Discussion

This is the first study of its kind to be conducted on a large scale to examine the sleeping environment of children in Bangladesh who have ASD. The research was conducted at a variety of autism schools, autism therapy centers, and non-autistic schools across all 8 divisions of Bangladesh, including Dhaka, Chittagong, Khulna, Mymensingh, Rajshahi, Rangpur, Barisal, and Sylhet. These cities were included because they were included in the sample group. This case control research was carried out in Bangladesh in order to compare the prevalence, sleeping disorder, and lifestyle of children who were diagnosed with autism. In case group, among the 200 respondents who were the guardian of the children of Autism Spectrum Disorder (ASD) were selected equally (12.5%) from each study area. Similarly in control group among the 200 respondents who were the guardian of Traditionally Developed Children (TDC) were selected equally (12.5%) from each study area. In ASD group the highest (54.50%) respondents family income were (20000 to 50000) BDT and only 17% respondents family income were >50000 BDT. In control group highest (37.50%) respondents family

income were (20000 to 50000) BDT and (31%) respondents family income was >50000 BDT. The highest (58.50%) ASD children were within the age of 9 to 12 years and 32.50% were 6 to 8 years old. Only 9% were from (3 to 5) years old. The highest (58%) TDC were within the age of 9 to 12 years and 29% were 6 to 8 years old. Only 13% were from (3 to 5) years old. The highest ASD children (67%) were male and (33%) were female on the other hand in TDC group (54%) were male and (46%) were female. According to parental blood relation between each other (15.5%) case group had direct relation while (82.5%). In control group 6.5% parents had relation between each other while 93.5% had not. In case group parents had higher blood relationship than control group. This result indicates that there are some association between parental blood relation and ASD. ASD children in case group highest (50.50%) were classical autism. Children in case group highest (35.00%) done M-Chat test. ASD children in case group highest (59%) had symptom of ADHD. According to children's response to social response's in ASD group rarely response was 35%, on the other hand always response was 100%. According to the respondent of case group children abnormal condition during birth highest 43% had birth injury and 33% were normal on the other hand in control group only (0.5%) had birth injury and (97%) were normal. Among 200 respondents of case group highest (70.50%) said that the appearance within few weeks of birth of their children were average, (10%) were abnormal healthy and (19.50%) were pale on the other hand in control group (58%) were average (30.50%) were normal, (4.50%) were abnormal healthy and only (7%) were pale. In case group children always become upset were (48%) and rarely or never were (20%). In control group children always become upset were (1%) and never were (20.50%). In case group children always reacted on simple questions before age 5 were (14%) and never were (15%). In control group children always reacted on simple questions before age 5 were (61.50%) and never were (2%). In ASD group 65% respondent said that their children have aggressive behavior. In TDC group (26.50%) respondent said that their children had destructive behavior. In ASD group 21% respondents said that their children have always sensitive behavior. In TDC group (12%) respondent said that their children have always sensitive behavior. In ASD group 33% respondents said that their children sleep once a day 26% said twice a day 20.50% said awake for

maximum times and 20% said rarely sleep. In TDC group 56.50% respondents said that their children sleep once a day 41% said twice a day 1% said awake for maximum times and 1.5% said rarely sleep. In case group (61.50%) respondents said that their children take sleeping pill. In control group (38.50%) respondents said that their children take sleeping pill. A recent survey conducted in China and India found sleeping patterns very similar to this one. The frequency of sleep disorders was reported to be 81.7 percent after research was conducted in China on the sleeping conditions of 475 preschool children with autism spectrum disorder (ASD). The four that had the highest percentages were sleep resistance (90.9 percent), sleep anxiety (91.7 percent), daytime drowsiness (60.7 percent), and sleep onset delay (59.1 percent), whereas the two that had the lowest percentages were night waking (25.4 percent) and sleep disordered breathing (19.8 percent).¹² The prevalence of autism spectrum disorder (ASD) in children aged 2 to 6 years old in India was 93 percent. The two with the lowest prevalence were night awakening (50 percent), and daytime sleepiness. The four with the highest prevalence were sleep resistance (95 percent), sleep anxiety (85 percent), sleep duration (81 percent), and sleep onset delay (66 percent), while the two with the lowest prevalence were night awakening (95 percent) (27 percent).¹³ Even though they have sleep patterns that are comparable to ours, the prevalence of the condition is somewhat different. We found that ASD has a greater detection rate of sleep disorders, although the results of certain dimensions are different. This was based on a combination of findings from domestic and international research. Having trouble falling asleep, shortening the amount of time spent sleeping, having a delayed onset of sleep, and waking up in the middle of the night are the four most prevalent symptoms of sleep disorders. It is a valuable reminder that, while discussing the sleeping arrangements of children in Bangladesh who have ASD, we should pay greater attention to these difficulties. This is an issue that has been brought to our attention. In addition, it provides support for the idea that subsequent study could investigate the sleep patterns related with ASD in a manner that is both more specific and complete. Because there are now a huge number of studies on the overall sleep status and autism symptoms of ASD, we do not individually evaluate and discuss it; rather, we concentrate the research on distinct aspects of the condition.

According to the findings of this research, the four aspects of that have the highest occurrence.¹⁴⁻¹⁶

Research conducted by Hollway¹⁷ on the data of 1583 children diagnosed with ASD indicated that social interaction deficiencies were connected to bedtime resistance, and that Asians had a higher risk of sleep resistance than children of other ethnicities. In our study we have found that 77.8% of the autistic children rarely are responsive to the social responses. It is generally accepted that behavioral insomnia of kids is the most common cause of sleep disturbances in children at the present time. It may be related to improper sleep training or environmental restrictions imposed by parents or caregivers, including sleep onset association type (children's specific dependence on stimuli, people, objects, or settings to start or return to sleep) and limit setting type. Sleep onset association type refers to children's specific dependence on stimuli, people, objects, or settings to start or return to sleep (behavior of delay or refusal before going to bed due to the difficulty of setting the limit by the caregiver).¹⁸⁻²¹ There is some evidence that limit setting insomnia in infancy might present itself as resistance at bedtime. A recent study found that sleep hygiene was strongly connected with the resistance.²² ASD children in China and even Asia have more problems with sleep hygiene or sleep behavior, which leads to a high prevalence of sleep resistance. This is because of the behavioral characteristics of ASD children as well as cultural variations. For instance, sleeping in the same bed as a partner is quite usual in many Asian cultures.^{13,23,24} The research conducted by Tudor established a correlation between the severity of autism and a short sleep duration as well as a delayed sleep initiation. A person's level of sleep anxiety can be used to predict their communication symptoms, and a person's level of sleep onset delay can be used to predict their level of autism, their stereotypical behaviors, and their social interaction deficiencies. Research conducted by Hollway¹⁷ demonstrated that sleep anxiety was associated with impaired taste and smell perception.¹⁷ According to the findings of our additional research, these two may have a connection to social interaction, communication, cognitive ability, linguistics, and stereotypical conduct. The difficulties falling asleep and staying asleep that come along with having a language impediment require special attention. Children with autism sometimes struggle to communicate their needs or feelings owing to language

challenges, which may indirectly make it more difficult for them to fall or stay asleep. This can have a negative impact on their quality of life. In our study according to the response of autistic children's, when he/she was asked to answer a simple question like what's your name it was reported rarely answered 98.8%. A recent study that was conducted in India demonstrated a favorable correlation between the severity of autism and daytime sleepiness in male toddlers between the ages of 2 and 6 years old.¹³ According to the findings of another study, the symptoms of autism were linked to daytime sleepiness in toddlers. When compared to toddlers who did not have autistic features, those who did have autism traits exhibited a higher rate of daytime sleepiness.²⁷ According to Hodge²⁸, daytime sleepiness decreased significantly with age in typically developing children aged 3–17 years old; however, daytime sleepiness continued to grow in children with ASD as they got older. Therefore, daytime sleepiness may be a symptom that can detect children's ASD early, and we should pay attention to the degree to which children sleep during the day. Sleep disturbances are caused by more complex neurobiological factors, including an aberrant level of melatonin, in addition to problematic sleeping behaviors and poor sleeping hygiene. When compared with normal children, those with autism spectrum disorder had significantly lower levels of melatonin and metabolites.²⁹⁻³⁵ In addition, their circadian rhythm was severely delayed. Melatonin levels declined at night and increased during the day. This helps to explain, at least in part, their delayed onset of sleep, nighttime awakening, and daytime lethargy. People with ASD may have a more difficult time falling or staying asleep due to the underlying biological rhythm and behavioral aspects of the condition.

In addition, Gender-stratified analysis showed that ASD children with common sleep problems exhibited higher ASD symptom scores both in male and female, but some results were not statistically significant in male. This may be caused by the small sample size of the girls group. The analysis found that the sample size of boys was 134 and that of girls was 66. There have been a number of studies that have revealed that a person's neuro developmental level or intellect may affect their sleep.^{8,9,11} According to the findings of one piece of research¹⁷, although intelligence does have some bearing on the degree to which one suffers from sleep anxiety, it has no influence whatsoever on

bedtime resistance or sleep duration. According to the findings of another study³⁶, intelligence only has an effect on waking up at night. In contrast, sleep problems can appear at any stage of neurodevelopment, according to the majority of research.^{6,7,9,10} Our research not only contributes to a better understanding of the sleeping environments of children in Bangladesh who have ASD, but it also lays the groundwork for more targeted interventions in the years to come. Bedtime resistance was identified as the most frequent sleep problem in this survey. Bedtime resistance is a sleep problem that is closely related to sleep behavior and sleep hygiene. It was likely that aberrant melatonin levels were the cause of both daytime tiredness and a delay in the onset of sleep. This suggests that in the future intervention, the cultivation of sleep hygiene and behavior is as important as the intervention of biological factors, especially starting from the actual situation of our country, combining our country's culture and resources to formulate intervention strategies. This is especially important starting from the actual situation of our country because it suggests that the cultivation of sleep hygiene and behavior is as important as the intervention of biological factors. In addition, there is still a clinical phenomena in which children with ASD frequently visit the doctor because they are behind in their language development. In most cases, parents focus more of their attention on the child's core symptoms, and as a result, they ignore the co-existing sleep difficulties that are related to the core symptoms. As a result, we believe that in the future, diagnosis and treatment should routinely incorporate sleep assessment in order to achieve early prevention, detection, and intervention of sleep.

Conclusion

At every developmental phase in Bangladesh, the prevalence of sleep disorders among children with ASD is noticeably higher than that of children who are typically developing. They are usually reluctant to go to bed, anxiousness, a delay in the beginning of sleep, and excessive daytime sleepiness. The evaluation of sleep should be a routine part of patient care in the clinical regularity of ASD appointments, as well as sleep during the course of the intervention. Early detection by using effective diagnosis and test required for ASD. ASD children need special care with proper life style management. A comprehensive special care and positive approach needed including

parents, teachers, relatives, neighbors, Govt. and non Govt. organizations to develop the life style and improve the sleep of ASD. This study observed that the ASD children have certain creativity especially in handicraft, art and cultural activities. Proper skill development training can improve their creativity. Therefore it is necessary to support them from all part of society.

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