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Original Research Article

Prevalence and Social Factors Influencing ADHD and Comorbidities in Bangladeshi Children: A Cross-Sectional Study

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ABSTRACT: ***Background:*** Attention-Deficit/Hyperactivity Disorder (ADHD) is a prevalent neurodevelopmental disorder affecting children globally. In Bangladesh, limited research has explored the sociodemographic and economic factors associated with ADHD and its comorbidities, necessitating a focused investigation. ***Objective:*** This study aimed to assess the prevalence of ADHD and its comorbid conditions among children in Bangladesh and identify the social determinants influencing these disorders. ***Methods:*** A cross-sectional study was conducted from January to June 2024, involving 140 children diagnosed with ADHD, recruited from Shishu Bikash Kendra, Dhaka Medical College, Sir Salimullah Medical College, and Mugda Medical College. Data were collected through structured questionnaires focusing on sociodemographic characteristics, parental education, socioeconomic status, and family dynamics. Descriptive statistics and chi-square tests were employed for data analysis. ***Results:*** The findings revealed that 46.4% of the participants had the combined type of ADHD, with notable comorbidities such as anxiety disorder (25%) and learning disabilities (17.9%). A significant association was found between low socioeconomic status and ADHD with comorbidities ($p = 0.01$). Parental education levels significantly influenced the prevalence of ADHD; 21.4% of children whose fathers had a graduation degree exhibited comorbidities ($p = 0.02$). Additionally, children from families experiencing conflict had a higher prevalence of ADHD (28.6%, $p = 0.005$). ***Conclusion:*** The study underscores the high prevalence of ADHD and its comorbidities among children in Bangladesh, significantly influenced by socioeconomic factors, parental education, and family dynamics. These findings highlight the urgent need for targeted interventions to improve awareness, diagnosis, and management of ADHD in vulnerable populations.

Keywords: ADHD, Comorbidities, Socioeconomic Factors, Parental Education, Children.

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INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent neurodevelopmental disorders affecting children and adolescents, often diagnosed in early childhood and frequently persisting into adulthood. It is a leading reason for children being referred to psychological and psychiatric clinics, with reports indicating that ADHD symptoms impact approximately 5% to 10% of the global pediatric population [1, 2]. Children with ADHD may struggle with attention, self-control, and impulsive behaviors, and may exhibit excessive activity levels. Hyperactivity, a hallmark symptom of ADHD, can result in significant psychological and social difficulties for affected children within

home, school, and community settings. According to the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), ADHD is characterized by behaviors that disrupt social functioning. Symptoms such as excessive motor activity in inappropriate contexts, fidgeting, and excessive talkativeness can interfere with a child's personal and educational life [3]. The manifestation of ADHD varies by age and gender, with boys being more frequently diagnosed than girls [4]. Early signs of hyperactivity often emerge around the age of four and become more evident during elementary school years. Research shows that while ADHD symptoms can evolve with age, the core characteristics often diminish in adulthood, particularly hyperactivity, which tends to be less pronounced [5]. Symptoms of ADHD are common among school-aged children and can extend into adulthood. Impulsivity, attention deficits, and hyperactivity characterize the disorder. Children with inattention may struggle with task completion and maintaining focus, while hyperactive individuals may fidget excessively or move around frequently. Impulsive children often display behaviors without forethought and struggle with self-control [6]. As noted, boys are more likely to exhibit externalized symptoms, such as hyperactivity and impulsivity, receiving diagnoses at rates approximately three times higher than girls. In contrast, girls with ADHD often present with internalized symptoms, such as inattentiveness and low self-esteem, which may predispose them to anxiety and depression9. Several factors contribute to the development of ADHD, including genetic predispositions and environmental influences such as premature birth, maternal smoking, and maternal obesity [7, 8]. Moreover, a family history of substance abuse has been implicated in the disorder's etiology. The diagnosis of ADHD involves a comprehensive multi-step process, including symptom rating scales and obtaining developmental histories from parents, teachers, and the child [9]. This study seeks to explore the prevalence and social determinants of ADHD and its comorbid conditions among children in Bangladesh, shedding light on the contextual factors influencing these disorders. By understanding these variables, we aim to inform targeted interventions that address the needs of affected children and their families.

METHODOLOGY

A cross-sectional study was conducted to examine the prevalence and social factors influencing ADHD (attention deficit hyperactivity disorder) and comorbidities in children. The research took place in Dhaka, Bangladesh, targeting a sample of 140 children diagnosed with ADHD. Data was collected from three medical institutions: Shishu Bikash Kendra of Dhaka Medical College, Sir Salimullah Medical College, and Mugda Medical College, over six months, from January to June 2024. A structured questionnaire was utilized to gather information, covering demographic details, clinical history of ADHD, comorbid conditions, and relevant social determinants, including socioeconomic status, parental education, and family environment. The questionnaire was based on validated tools for ADHD diagnosis and associated social factors. Data collection was carried out through face-to-face interviews with parents or caregivers, complemented by clinical records from the respective institutions. Trained researchers administered the interviews in a confidential setting. Informed consent was obtained from all participants, with parents or guardians signing the consent forms on behalf of their children.

RESULT

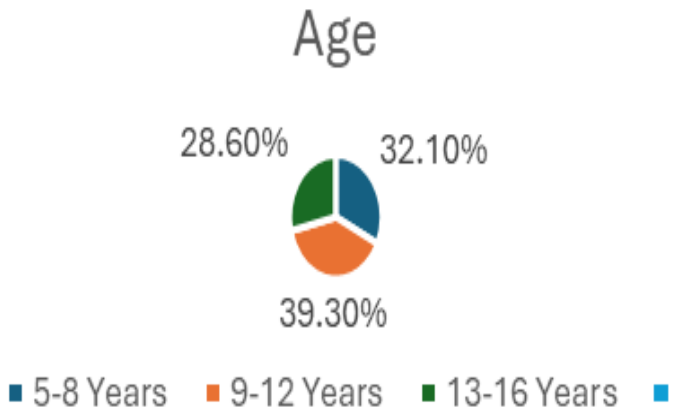

Figure 1: Age of Study Participants (n = 140)

Figure 1 illustrates the age distribution of children in the study, categorized into three age groups: 5-8 years, 9-12 years, and 13-16 years. The largest proportion of participants falls within the 9–12-year age group (39.3%), followed by the 6–8-year group (32.1%) and the 13–16-year group (28.6%).

Table 1 Gender and Socioeconomic Status of Study Participants (n = 140)

Gender	**Frequency (n)**	**Percentage (%)**
Male	85	60.7
Female	55	39.3
Socioeconomic Status		
Low Income	78	55.7
Middle Income	50	35.7
High Income	12	8.6

Table 1 shows that 60.7% of the children in the study are male (n = 85), while 39.3% are female (n = 55). In terms of socioeconomic status, the majority of children (55.7%) come from low-income families (n = 78), followed by middle-income families (35.7%, n = 50), and a small proportion from high-income families (8.6%, n = 12).

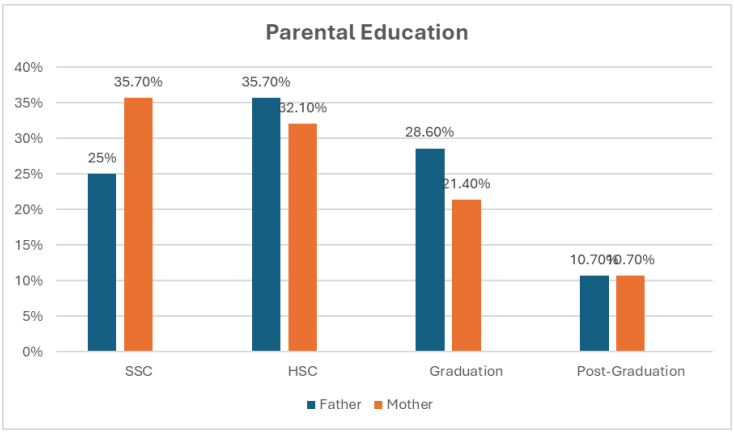

Figure 2: Parental Education of Study Participants (n = 140)

Figure 2 presents the distribution of parental education levels (both father and mother) among the children in the study, categorized as SSC, HSC, Graduation, and Post-Graduation. For fathers, the largest group had completed HSC (35.7%), followed by those with a Graduation degree (28.6%). A smaller proportion had completed SSC (25.0%), while only a minority had a post-graduation degree (10.7%). For mothers, the highest percentage had an SSC qualification (35.7%), followed by HSC (32.1%), Graduation (21.4%), and post-graduation (10.7%).

Table 2: Prevalence of ADHD Subtypes and Comorbid Conditions (n = 140)

Condition	Frequency (n)	Percentage (%)
ADHD (Inattentive type)	45	32.1
ADHD (Hyperactive-Impulsive type)	30	21.4
ADHD (Combined type)	65	46.4
Comorbid Conditions		
ADHD + anxiety disorder	35	25.0
ADHD + Oppositional Defiant Disorder	20	14.3
ADHD + Learning Disability	25	17.9
ADHD + autism spectrum disorder	15	10.7

Table 2 highlights that the combined type of ADHD was the most prevalent (46.4%) among the children. The most common comorbid condition was anxiety disorder (25.0%), followed by learning disabilities (17.9%).

Table 3: Association Between Socioeconomic Status and ADHD Comorbidities (n = 140)

Socioeconomic Status	ADHD Alone (%)	ADHD + Comorbidities (%)	p-value
Low Income	30 (21.4)	48 (34.3)	0.01
Middle Income	20 (14.3)	30 (21.4)	
High Income	10 (7.1)	2 (1.4)	

Table 3 shows a statistically significant association (p = 0.01) between low socioeconomic status and ADHD comorbidities. Children from low-income families had a higher prevalence of comorbidities (34.3%) compared to those from middle- and high-income backgrounds.

Table 4: Parental Education and ADHD Comorbidities (n = 140)

Parental Education (Father)	ADHD Alone (%)	ADHD + Comorbidities (%)	p-value
SSC	20 (14.3)	15 (10.7)	0.02
HSC	25 (17.9)	25 (17.9)	
Graduation	10 (7.1)	30 (21.4)	
Post-Graduation	5 (3.6)	10 (7.1)	

Table 4 presents the association between paternal education and ADHD comorbidities. Children of fathers with graduation-level education had the highest occurrence of comorbidities (21.4%). A significant association was observed between paternal education and the presence of ADHD comorbid conditions (p = 0.02).

Table 5: Family Factors and ADHD Prevalence (n = 140)

Variable	ADHD Alone (%)	ADHD + Comorbidities (%)	p-value
Family Conflict	20 (14.3)	40 (28.6)	0.005
Single-Parent Family	25 (17.9)	15 (10.7)	0.04
Number of Siblings (3 or more)	35 (25.0)	40 (28.6)	0.01

Table 5 demonstrates the role of family factors in ADHD prevalence. Children from families experiencing conflict had a significantly higher prevalence of ADHD with comorbidities (28.6%) (p = 0.005). Similarly, children with three or more siblings were more likely to have ADHD and comorbidities (p = 0.01).

Table 6: School Performance and ADHD Severity (n = 140)

ADHD Severity	Poor School Performance (%)	Good School Performance (%)	p-value
Mild ADHD	15 (10.7)	20 (14.3)	0.03
Moderate ADHD	25 (17.9)	15 (10.7)	
Severe ADHD	40 (28.6)	25 (17.9)	

Table 6 shows the association between ADHD severity and school performance. Children with severe ADHD had the highest prevalence of poor school performance (28.6%). A statistically significant association (p = 0.03) was observed between ADHD severity and academic performance.

Table 7: Impact of Parental Occupation on ADHD and Comorbidities (n = 140)

Parental Occupation	ADHD Alone (%)	ADHD + Comorbidities (%)	p-value
Unemployed Mother	40 (28.6)	30 (21.4)	0.02
Employed Father (Laborer)	35 (25.0)	45 (32.1)	
Employed Father (Professional)	15 (10.7)	5 (3.6)	

Table 7 investigates the relationship between parental occupation and ADHD comorbidities. Fathers working in labor-intensive jobs were associated with a higher incidence of comorbid ADHD (32.1%). Additionally, unemployed mothers were more likely to have children with ADHD comorbidities, showing a significant association (p = 0.02).

DISCUSSION

This cross-sectional study aimed to explore the prevalence and social determinants of ADHD and its comorbidities among children in Bangladesh, focusing on sociodemographic variables, parental education, socioeconomic status, and family factors. A total of 140 children diagnosed with ADHD were included, and the results revealed critical associations between these factors and ADHD, in line with existing literature. Among the participants, the combined ADHD type was the most prevalent, affecting 46.4% of the children, followed by the inattentive type (32.1%) and the hyperactive-impulsive type (21.4%). These findings align with a global trend where the combined type is most frequently observed among ADHD diagnoses [10, 11]. A significant proportion of children also had comorbid conditions, with 25% suffering from ADHD and anxiety disorder, 17.9% with learning disabilities, and 14.3% with oppositional defiant disorder (ODD). The presence of multiple comorbidities, as seen in this study, is supported by research that suggests ADHD often co-occurs with other psychiatric disorders. Studies conducted by Gnanavel *et al*. highlight that up to 60-80% of children with ADHD exhibit at least one comorbid psychiatric disorder, emphasizing the complex nature of ADHD [12, 13]. The study found

a significant association between socioeconomic status and ADHD with comorbidities. Children from low-income families had the highest prevalence of ADHD with comorbidities (34.3%), compared to those from middle-income (21.4%) and high-income families (1.4%) (p = 0.01). These findings are consistent with studies that indicate lower socioeconomic status is a significant risk factor for ADHD, possibly due to reduced access to healthcare, educational resources, and early intervention programs [14]. A meta-analysis by Russell *et al.* showed that children from lower-income families were 1.5 times more likely to be diagnosed with ADHD, reflecting how economic disadvantage may exacerbate ADHD symptoms and increase the risk of comorbidities [15]. Parental education was another key determinant in this study. Fathers with a graduation degree had the highest proportion of children with ADHD and comorbidities (21.4%, p = 0.02), followed by those with HSC (17.9%) and SSC (10.7%). This pattern suggests that the educational background of parents may influence both the likelihood of an ADHD diagnosis and the management of comorbid conditions. Studies have shown that lower parental education is associated with higher ADHD prevalence. A survey by Rowland *et al*. (2018) also found that children of parents with lower educational levels are more likely to exhibit ADHD symptoms, which may stem from reduced awareness of early symptoms and a lack of access to healthcare resources [16].

In this study, males accounted for 60.7% of the participants, while females represented 39.3%. This male predominance is consistent with numerous studies worldwide, which report a male-to-female ratio ranging from 2:1 to 4:1 in ADHD diagnoses. The higher ADHD diagnosis rates in boys may be attributed to the fact that boys often exhibit more overt hyperactive and disruptive behaviors, which are more likely to be noticed by parents and teachers. In contrast, girls with ADHD usually display inattentive symptoms, which may be underdiagnosed [17]. Family dynamics were found to play an influential role in the occurrence of ADHD and its comorbidities. Children from families experiencing conflict had a significantly higher prevalence of ADHD with comorbidities (28.6%, p = 0.005), while those from single-parent families showed a 17.9% rate of ADHD alone. The association between family conflict and ADHD is well-documented, with evidence suggesting that unstable home environments can exacerbate ADHD symptoms. Studies have also shown that parental stress and conflict may impact the child's emotional regulation and attention, further contributing to the development of comorbid conditions. Children with severe ADHD showed the poorest school performance (28.6%, p = 0.03), reinforcing the well-established link between ADHD severity and academic difficulties. Research by Kent *et al*., and Molina *et al*., support this finding, demonstrating that children with ADHD, particularly those with severe symptoms, are at a significantly higher risk of academic failure and grade retention. Poor academic performance is often a direct consequence of ADHD symptoms such as inattention, impulsivity, and disorganization, further exacerbated by comorbid learning disabilities [18, 19]. Finally, the study revealed an association between parental occupation and ADHD comorbidities. Fathers employed in labor-intensive jobs were more likely to have children with ADHD and comorbid conditions (32.1%), while unemployed mothers were also associated with a higher rate of ADHD comorbidities (21.4%, p = 0.02). This aligns with existing evidence that suggests the occupation and economic stability of parents influence their ability to access mental health services for their children [20].

CONCLUSION

The findings of this study highlight the complex interplay between socioeconomic status, parental education, family dynamics, and ADHD comorbidities among children in Bangladesh. The high prevalence of ADHD and its comorbidities in children from lower-income families, coupled with the significant impact of parental education and family conflict, underscores the need for targeted interventions. These results are in line with global trends and highlight the importance of addressing

socioeconomic and family-related factors in ADHD management. Further research is needed to explore the long-term impact of these social determinants on the mental health outcomes of children with ADHD.

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