

### Emotional and Behavioral Performance among Adolescents Attending at Outpatient Departments of Bangabandhu Sheikh Mujib Medical University during COVID-19 Pandemic

#### Abstract:

The purpose of the research was to assess emotional and behavioral presentation among adolescents during the COVID-19 pandemic visiting outpatient departments of Bangabandhu Sheikh Mujib Medical University (BSMMU) and to compare the extent of emotional and behavioral symptoms among adolescents with key factors related to COVID-19. A cross-sectional study was conducted among adolescents from 11–17 years of age attending six outpatient departments of Bangabandhu Sheikh Mujib Medical University (BSMMU) from October to December 2020. A purposive sampling technique was applied and total 146 samples were selected. A validated Bangla SDQ scale of youth self-report measure (11 to 17 years) baseline version was used for data collection. Data were collected by a face-to-face interview. The study protocol was approved by Institutional Review Board (IRB) of Bangabandhu Sheikh Mujib Medical University (BSMMU). Both descriptive and inferential statistics were executed for data analysis by using SPSS-25 and MS Excel Software. On basis of SDQ-25 scale, among the three variables, around one-third respondents (34%) had emotional symptoms while 31% and 17% had conduct symptoms and hyperactivity symptoms respectively during the COVID-19 pandemic. Among the adolescents who had a history of positive symptoms for COVID-19, 26.5% had hyperactivity symptoms, on the other hand adolescents who had no history of positive symptoms for COVID-19, only 9.8% had significant hyperactivity symptoms. There was a highly significant association ( $p=0.004$ ) present between behavioral (hyperactivity) symptoms and having a history of positive symptoms for COVID-19. Adolescents who had wariness about uncertainty of COVID-19 pandemic, 25% had significant emotional symptoms on the other hand who had no wariness about uncertainty of COVID-19 pandemic, 14.3% had emotional symptoms. There was significant association ( $p=0.048$ ) present between emotional symptoms with 'felt wariness about uncertainty of COVID -19 pandemic. There was also an association ( $p=0.035$ ) present between behavioral (hyperactivity) symptoms with 'relationship status among friends. A higher proportion of female adolescents had emotional and hyperactivity symptoms than male adolescents. However, male adolescents suffered mostly for conduct symptom compared to female. Adolescents attending in selected outpatient departments of BSMMU, were especially vulnerable to emotional and behavioral problem based on symptoms developing during COVID-19 pandemic.

**Keywords:** Emotional-behavioral symptoms, Adolescents, COVID-19 pandemic, Lockdown.

#### Introduction:

The COVID 19 has led to rapid, unexpected changes to the lives of millions of adolescents and many of them are suffering from emotional and behavioral problems during this pandemic due to significant changes to daily life [1]. Recent studies have shown that the prevalence of behavioral problems among school-aged children in China varied from 4.7% to 10.3% in home quarantine during the COVID 19 outbreak, [2] and in India, effect of lockdown due to COVID19 on psychological health of young adults estimated that 16.9% and 18.2% of respondents are suffering from emotional and behavioral problems [3].

COVID-19 first identified in Bangladesh back on 8<sup>th</sup> March 2020, thereafter, country wide movement were restricted by the Government since 26<sup>th</sup> March 2020. Adolescent suffered a lot due to various associated factors, which arises for COVID-19 pandemic, such as movement restriction, closure of educational institution, prolonged home stay, infection and death of family members, losing livelihoods, lack of communication with peer, fear of contagion, and lack of information and awareness, financial crisis, uncertainty made their mental health more vulnerable [4]. Among the adolescents of Bangladesh, prevalence of emotional, conduct and hyperactivity disorder were increased significantly during the lockdown period than before [5]. According to a study of Bangladesh, prevalence of any predictive psychiatric disorder among adolescents before lockdown was 20.5% and within lockdown was 39.7% and the difference was highly significant ( $P < 0.001$ ) [5].

There were few studies conducted in Bangladesh to identify the impact of COVID-19 pandemic outbreak on mental health of adolescents, however, none of them done on adolescents attending at outpatient departments of a hospital or healthcare center for different health issues [4-6]. Bangabandhu Sheikh Mujib Medical

University is one of the largest tertiary care specialized hospital, thus we conducted study here and data from this hospital can help to get an idea about distribution of emotional and behavioral presentations of adolescents during COVID-19 pandemic in our country.

### Objective

The purpose of the research was to assess emotional and behavioral presentation among adolescents during the COVID-19 pandemic visiting outpatient departments of Bangabandhu Sheikh Mujib Medical University (BSMMU) and to compare the extent of emotional and behavioral symptoms among adolescents with key factors related to COVID-19.

### Materials and Methods

This cross-sectional study has been conducted among 11 to 17 years adolescent attending at six outpatient departments (Internal Medicine, Gynecology and Obstetrics, Skin and Venereal Diseases, Otolaryngology and Head-Neck Surgery, Eye department, General Pediatrics) of BSMMU for others health related problems from October to December 2020. The required sample size was 146. Non-probability sampling technique was used to collect data. Face-to-Face interview was taken in outdoor.

A semi-structured modified questionnaire was used for data collection with validated Bangla version of the Strength and difficulties questionnaire (SDQ-25) scale for 11 to 17 years [6], which used to measure the presentation of emotional and behavior symptoms among 11 to 17 years adolescents. The SDQ-25 scale consists of 25 attributes, are divided among five scales of five items each, generating scores for emotional, conduct, hyperactivity, peer problems, and pro-social behaviors. Each questions answer option has, 0 = not true, 1= somewhat true, 2 = certainly true, where for each score lowest value was 0 and highest value was 10.

In this study, we have done assessment of emotional and behavioral presentations only. Emotional and behavioral presentation score were divided into 3 categories; emotional symptoms score, conduct symptoms score and hyperactivity symptoms score. This total score consists of total 15 items of SDQ-25 scale. Here, we consider cutoff margin, which is recommended to identify an adolescent (11 to 17) with high risk of emotional and behavioral problems (emotional symptoms > 5, conduct symptoms > 4 and hyperactivity symptoms > 6).

### Statistical Analysis:

Data analysis was done through Univariate (Frequency, percentage, mean, standard deviation) and bivariate analysis (Chi square test, significant level  $p < 0.05$ ) by using SPSS-25 and MS Excel Software.

### Results:

Figure 1 shows that among the 146 participants, 56.8% were female and remaining 43.2% were male respondents. Figure 2 shows that the age of majority of the respondents was between 15 to 17 years; mean age was 14.68 years. Table 1 shows that highest 97.3% was Muslim and 2.7% were Hindu and others. Respondents' education shows that 17.1% were from primary level, 57.5% were from secondary level and 25.3% were from higher secondary level. None of the participants was in 'no formal education' group.

Table 1: Religion, Marital status and Educational level of the respondents

Variables	Frequency(n)	Percentage (%)
<b>Religion</b>		
Islam	142	97.3%
Hindu and others	4	2.7%
<b>Marital Status</b>		
Unmarried	140	95.9%
Married	6	4.1%

Education level		
Primary	25	17.1%
Secondary	84	57.5%
Higher secondary	37	25.3%

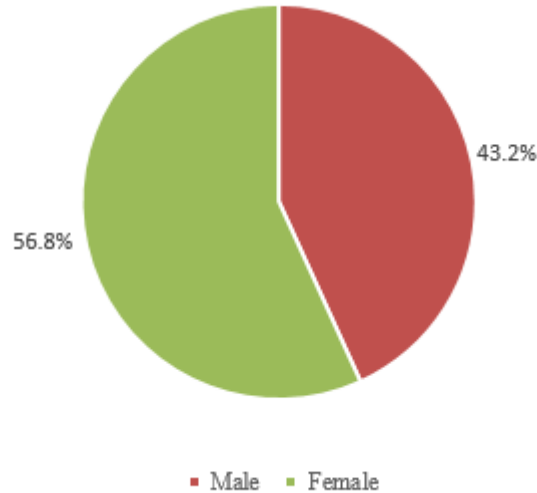


Figure 1: Sex of respondents

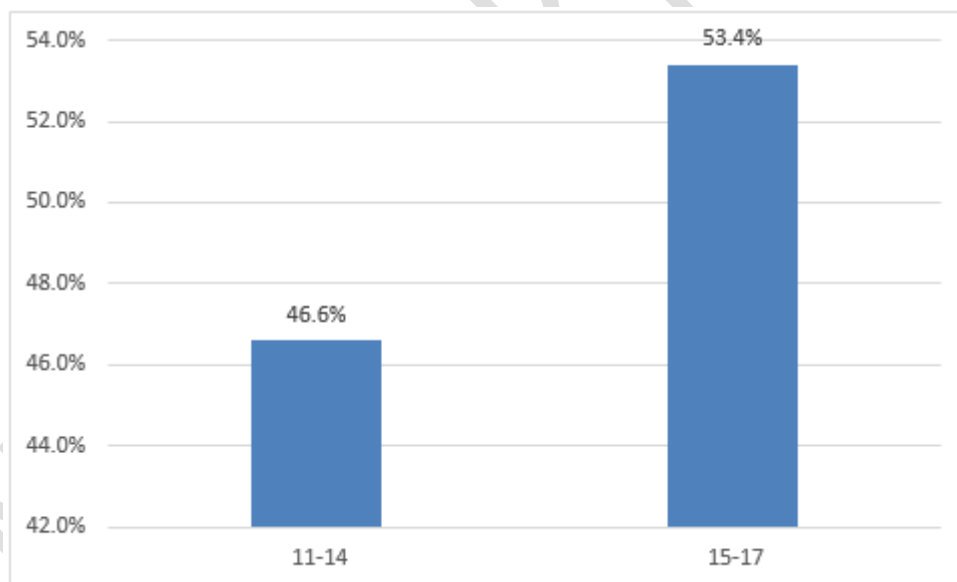


Figure 2: Age of the respondents

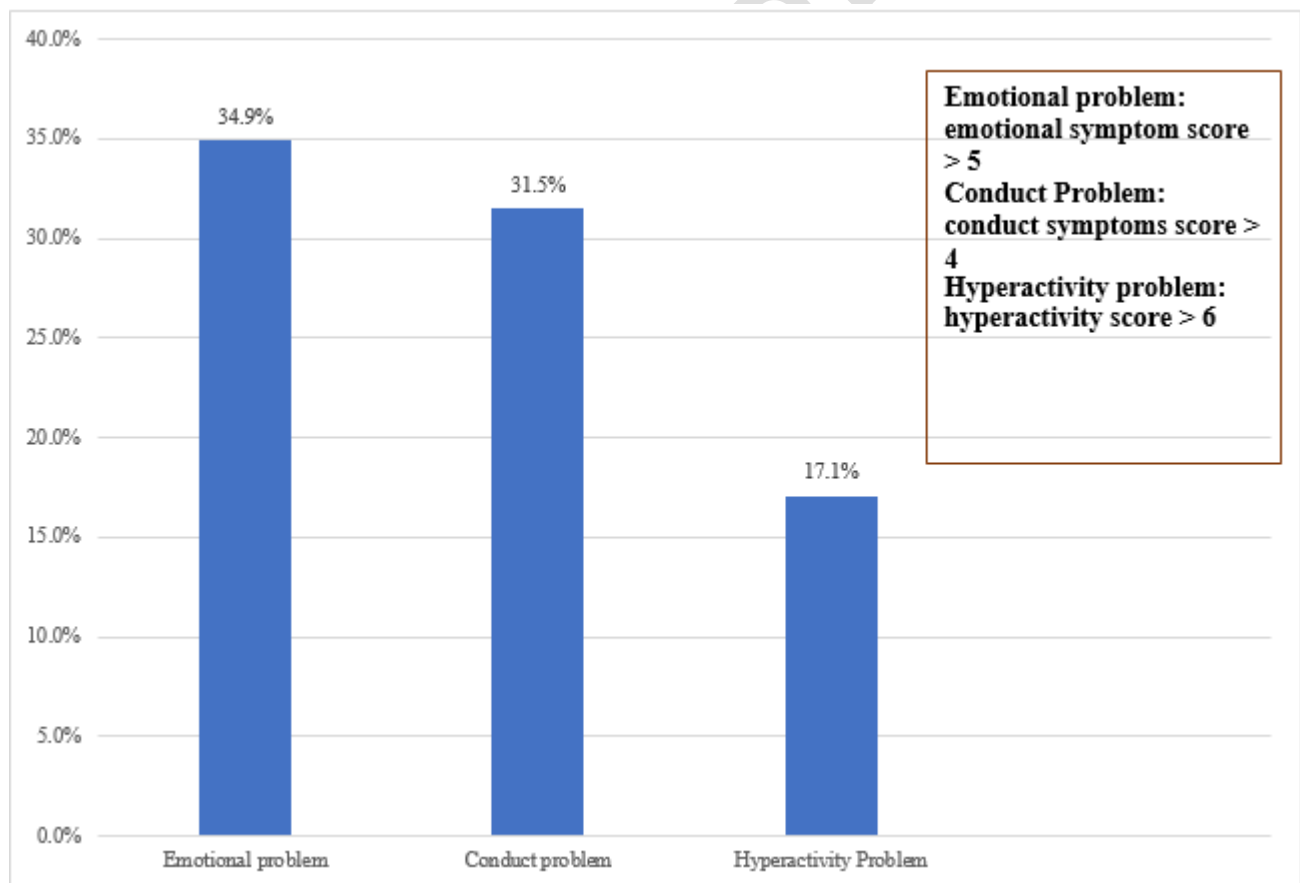
The table 2 indicates that majority 26.5% of the female adolescents had emotional symptoms while only 12.7% of male adolescent had emotional symptoms. Majority of the respondents (26.9%) who were suffering from emotional problems – belongs to 15 - 17 years of age group.

However, male (19.0%) suffers mostly for behavioral (conduct) symptoms and within 15 to 17 years' age group about 17.9% respondents were suffering for conduct problems. Among all respondents, 12.0% of the female adolescents had behavioral (hyperactivity) symptoms while only 9.5% of male adolescent had behavioral (hyperactivity) symptoms and 12.8% adolescents in age group 15 to 17 years were suffering more in hyperactivity problem. There is no significant association of emotional, behavioral (conduct) and behavioral (hyperactivity) symptoms with age, sex, educational status and marital status of the respondents.

**Table 2: Association between socio-demographic characteristics of the respondents and emotional, conduct and hyperactivity symptoms**

Variable		Age		Sex		Education			Marital status		
		11-14	15- 17	Male	Female	No formal education	Primary	Secondary	Higher secondary	Single	Married
Emotional	Normal	59(86.8%)	57(73.1%)	55(77.3%)	61(73.5%)	0(0.0%)	22(88%)	68(81%)	26(70.3%)	113(54.8%)	3(60%)
	Problem	9 (13.2%)	21(26.9%)	8(12.7%)	22(26.5%)	0(0.0%)	3(12.0%)	16(19.0%)	11(29.7%)	93(45.2%)	2(40%)
	P-value	0.123		0.111		0.392			0.163		
Conduct	Normal	60(88.2%)	64(82%)	51 (81%)	73 (88%)	0(0.0%)	23 (92%)	69(82.2%)	32(86.5%)	120(85.7%)	4(66.7%)
	Problem	8(11.8%)	14(17.9%)	12(19.0%)	10(12.0%)	0(0.0%)	2(8.0%)	15(17.9%)	5(13.5%)	20(14.3%)	2(33.3%)
	P-value	0.444		0.348		0.63			0.428		
Hyperactivity	Normal	62(91.2%)	68(87.2%)	57(90.5%)	73(87.9%)	0(0.0%)	25 (100%)	73(86.9%)	32(86.5%)	125(89.3%)	15(10.7%)
	Problem	6(8.8%)	10(12.8%)	6(9.5%)	10(12.0%)	0(0.0%)	0(0.0%)	11(13.1%)	5(13.5%)	5(83.3%)	1(16.7%)
	P-value	0.728		0.438		0.368			0.751		

Figure 3 shows that among the three variables, around one-third respondents (34%) had emotional symptoms while 31% and 17% had conduct symptoms and hyperactivity symptoms respectively during the COVID-19 pandemic.



**Figure 3: Prevalence of Emotional, Conduct and Hyperactive Problem**

Table 3 shows the association of emotional symptoms with adolescents' exposure to the COVID-19 pandemic situation. According to the table, there was no significant ( $p < 0.05$ ) difference or association present between emotional and behavioral (conduct) symptoms with the adolescents' exposure to the COVID-19 pandemic

situation but there was an association of behavioral (hyperactivity) symptoms with adolescents' exposure to the COVID-19 pandemic situation.

Among the adolescents who had a history of positive symptoms for COVID-19, among them, 26.5% had hyperactivity symptoms which were in problem group. Again, adolescents who had no history of positive symptoms for COVID-19, among whom 9.8% had significant hyperactivity symptoms which were in problem group. There is a highly significant association ( $p=0.004$ ) present between behavioral (hyperactivity) symptoms and having a history of positive symptoms for COVID-19.

**Table 3: Association between adolescents' exposure to COVID-19 pandemic situation and emotional, conduct and hyperactivity symptoms (P value <0.05)**

Variable	Emotional		Conduct		Hyperactivity	
	Normal	Problem	Normal	Problem	Normal	Problem
<b>Diagnosed case as a Covid-19 positive case</b>						
<b>Yes</b>	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
<b>No</b>	116(80%)	29(20.0%)	123(84.9%)	22(15.2%)	1(100.0%)	0(0.0%)
<b>I don't know</b>	0(0.0%)	1(100.0%)	1(100%)	0(0.0%)	129(88.4%)	16(11.0%)
<b>P-Value</b>	<b>0.143</b>		<b>0.793</b>		<b>0.901</b>	
<b>Have any Positive symptoms for COVID-19</b>						
<b>Yes</b>	28(82.3%)	6(17.6%)	31(91.1%)	3(8.8%)	29(85.2%)	5(26.5%)
<b>No</b>	88(78.6%)	24(21.4%)	93(83.1%)	19(17.0%)	111(90.2%)	11(9.8%)
<b>P-value</b>	<b>0.708</b>		<b>0.509</b>		<b>0.004</b>	
<b>H/O Positive COVID -19 case in family</b>						
<b>Yes</b>	11(78.5%)	8(57.1%)	14(92.9%)	1(7.1%)	12 (85.7%)	2(14.3%)
<b>No</b>	105(78.8%)	87(65.9%)	111(84.1%)	21(15.9%)	118(89.4%)	14(10.6%)
<b>P-value</b>	<b>0.392</b>		<b>0.638</b>		<b>0.898</b>	
<b>H/O Death due to COVID-19 in family</b>						
<b>Yes</b>	6 (75%)	2(25.0%)	8(100%)	0(0.0%)	5(62.5%)	3(37.5%)
<b>No</b>	110(79.7%)	28(20.3%)	116(84.1%)	21(15.9%)	125(90.6%)	13(9.4%)
<b>P-value</b>	<b>0.946</b>		<b>0.406</b>		<b>0.416</b>	
<b>Stayed at home fulltime due to COVID-19 pandemic</b>						
<b>Less than or equal 5 month</b>	76(75.3%)	25(24.8%)	82(81.2%)	19(18.8%)	89(88.1%)	12(11.9%)
<b>More than 5month</b>	40 (88.9%)	5(11.1%)	42(93.3%)	3(6.7%)	6(91.1%)	4(8.9%)
<b>P-value</b>	<b>0.111</b>		<b>0.096</b>		<b>0.861</b>	
<b>H/O family faced social isolation due to COVID-19</b>						
<b>Yes</b>	11(84.6%)	2(15.4%)	12(92.3%)	1(7.7%)	11(84.6%)	2(15.4%)
<b>No</b>	105 (79%)	28(21.1%)	112(84.2%)	21(15.8%)	119(89.5%)	14(10.5%)
<b>P-value</b>	<b>0.89</b>		<b>0.638</b>		<b>0.831</b>	
<b>Home environment during COVID-19</b>						
<b>Never felt uneasiness</b>	30(88.2%)	4(11.8%)	28(85.3%)	5(14.7%)	28(82.3%)	6(17.6%)
<b>sometimes felt uneasiness</b>	50(73.5%)	18(26.5%)	56(82.4%)	12(17.6%)	62 (91.2%)	6(8.8%)
<b>almost always</b>	32(84.2%)	6(15.8%)	33(86.9%)	5(13.2%)	35 (92.1%)	3(7.9%)

<b>felt uneasiness ss</b>						
<b>always</b>	1(16.7%)	2(33.3%)	6(100.0%)	0(0.0%)	5(83.3%)	1(16.7%)
<b>felt uneasiness ss</b>						
<b>P-value</b>	<b>0.517</b>		<b>0.7</b>		<b>0.619</b>	

Table 4 shows the effect of COVID-19 with emotional, behavioral (conduct) and behavioral (hyperactivity) symptoms.

Adolescents who had wariness about uncertainty of COVID-19 among them 25% had significant emotional symptoms. Again, adolescents who had no wariness about uncertainty of COVID-19 pandemic, among them 14.3% had emotional symptoms. There is significant association ( $p=0.048$ ) present between emotional symptoms with 'felt wariness about uncertainty of COVID -19 pandemic.

There is also an association ( $p=0.035$ ) present between behavioral (hyperactivity) symptoms with 'relationship status among friends.

**Table 4: Association between effect of COVID-19 during pandemic situation and emotional, conduct and hyperactivity (P value <0.05) symptoms**

Variable	Emotional		Conduct		Hyperactivity	
	Normal	Problem	Normal	Problem	Normal	Problem
H/O financial crisis due to COVID-19						
Yes	34(75.6%)	11(24.4%)	37(87.2%)	8(17.8%)	41(91.1%)	4(8.9%)
No	82(81.2%)	19(18.8%)	87(86.2%)	14(13.9%)	89(88.1%)	12(11.9%)
P-Value	0.245		0.551		0.712	
Feel fear due to spread of COVID -19						
Yes	85(77.2%)	25(22.7%)	93(84.6%)	17(15.5%)	98(89.1%)	12(10.9%)
No	31(86.1%)	5(13.9%)	31(86.2%)	5(13.9%)	32(88.9%)	4(11.1%)
P-value	0.493		0.848		0.607	
Felt wariness about uncertainty of COVID -19 pandemic						
Yes	66(75%)	22(25.0%)	74(84.1%)	14(15.9%)	74(84.1%)	14(15.9%)
No	48(85.7%)	8(14.3%)	48(93.1%)	8(14.3%)	54(96.5%)	2(3.6%)
P-value	0.048		0.461		0.327	
Felt depression due to uncertainty of COVID -19 pandemic						
Yes	55(79.7%)	14(20.3%)	57(82.6%)	12(17.4%)	59(85.5%)	10(14.5%)
No	61(79.2%)	16(20.8%)	67(87%)	10(13.0%)	71(92.2%)	6(7.8%)
P-value	0.339		0.68		0.327	
H/O food crisis faced family due to COVID 19 pandemic						
Yes	7(77.8%)	2(22.2%)	7(71.8%)	2(22.2%)	9(100.0%)	0(0.0%)
No	109(79.65%)	28(20.4%)	117(25.4%)	20(14.6%)	121(88.4%)	16(11.7%)
P-value	0.957		0.78		0.382	
Relationship status among friend						
Good as non-covid situation	26(92.9%)	2(7.1%)	21(75%)	7(25.05)	26(92.9%)	2(7.1%)
Bad then non covid situation	40(76.95%)	12(23.1%)	49(94.2%)	3(5.8%)	48(92.3%)	4(7.7%)
Good then non covid situation	6(100%)	0(0.0%)	4(66.7%)	2(33.3%)	5(83.3%)	1(16.7%)
Same as non-covid situation	84(73.3%)	16(26.7%)	50(83.3%)	10(16.7%)	51(85%)	9(15.0%)
P-value	0.201		0.098		0.035	

## Discussion

In our study 34% had emotional 31% had conduct and 17% had hyperactivity symptoms respectively during the COVID-19 pandemic. In a similar study found that a small proportion of children (8.0%, 65/816 in Wuhan and 11.7%, 98/839 in Shanghai) had a substantial risk of clinically significant emotional problems which is lower prevalence than our study and 39.5% of children in Wuhan and 58.4% in Shanghai had behavioral problems such as aggressive or stubborn behavior and tantrums or meltdowns during the epidemic ( $p < 0.001$ ) which is higher than our study [7]. This result is slightly different because in our study the sample size is smaller and our study conducted in one area whereas the other study conducted in two big cities with large sample.

Our study found that adolescents of 15 and 17 years were suffering more from both emotional and behavioral problems compared to 11 to 14 years. In Bangladesh other studies found that pediatric psychiatric disorder was significantly higher in late adolescence than in early adolescence [8]. Here, the majority of the female adolescents had emotional and behavioral (hyperactivity) symptoms. Studies conducted during COVID-19 pandemic shows emotional symptoms is higher in girls than boys [2,3,9] and another study conducted among children and adolescents in Bangladesh prior to COVID-19 pandemic found girls had more emotional disorder, and boys have more behavioral disorder, [10] which is consistent with our study.

Female adolescents, on the other hand, have suffered more from emotional and behavioral problems during the COVID-19 pandemic, owing to unequal distribution of care and domestic work, greater involvement in household chores, leaving them with no time to learn, limited educational opportunities, uncertainty about access to health services, and experiencing more family violence and abuse [11].

**In this study it was reported** that adolescents who had wariness about uncertainty of COVID-19 pandemic, 25% had significant emotional symptoms on the other hand who had no wariness about uncertainty of COVID-19 pandemic, 14.3% had emotional symptoms. There is an association ( $p = 0.048$ ) present between emotional symptoms with 'felt restlessness due to uncertainty of the COVID-19 pandemic'. Research on adolescent mental well-being during COVID 19 in Indonesia also found that subjective perception towards anxiety due to the COVID 19 pandemic has an association towards emotional problems [12].

In Bangladesh, during COVID-19, an online study among college and university students showed that perceived COVID-19 symptoms were significantly associated with creating a higher score on the DASS stress subscale [12]. It matches our findings. There is also an association ( $p = 0.035$ ) present between behavioral (hyperactivity) symptoms and "relationship between friends." We found a similar association in a study among Indian young adults [3].

**In this study it was reported** that among the adolescents who had a history of positive symptoms for COVID-19, 26.5% had hyperactivity symptoms, on the other hand adolescents who had no history of positive symptoms for COVID-19, and only 9.8% had significant hyperactivity symptoms. There was a highly significant association ( $p=0.004$ ) present between behavioral (hyperactivity) symptoms and having a history of positive symptoms for COVID-19. This is a new finding which can be used as a guideline of further study.

## 10. Limitations

The study was limited to six selective outpatient departments of a selected tertiary Hospital of Dhaka, which may be uniquely different with other health care setting or general adolescent population. The study was conducted using a pre-tested semi structured questionnaire. Only self-version of the scale was used for emotional and behavior presentation screening, that may effect on measuring actual mental status. Despite these limitations, our study shows that significant number of adolescents had emotional and behavioral presentation who was attending at the outpatient departments of BSMMU during COVID-19 pandemic.



## 11. Conclusion

Adolescents suffered mostly from emotional problems. Around one-third of the adolescents had emotional symptoms while 31% and 17% had conduct symptoms and hyperactivity symptoms respectively. Majority of the female adolescents had emotional and hyperactivity symptoms compared to male adolescents. Peer relationship plays a vital role in minimizing emotional and behavioral problems among adolescents. Further follow up or long-term longitudinal study on adolescents' behavior is recommended to identify the after COVID-19 mental health condition. These will help to evaluate the mental health changes among adolescents during and after COVID-19 pandemic.

## Ethical Approval and Consent:

Prior conducting data collection, ethical clearance from Institutional Review Board of BSMMU (ref. no. BSMMU/2020/9375, date 25-10-2020) and Parent/Guardian's informed written consent and adolescent's informed written assent was taken from participants.

## References:

1. Guessoum SB, Lachal J, Radjack R, et al. Adolescent psychiatric disorders during the COVID-19 pandemic and lockdown. *Psychiatry Res.* 2020;291:113264. doi:10.1016/j.psychres.2020.113264.
2. Liu Q, Zhou Y, Xie X, et al. The prevalence of behavioral problems among school-aged children in home quarantine during the COVID-19 pandemic in china. *J Affect Disord.* 2021;279:412-416. doi:10.1016/j.jad.2020.10.008.
3. Sabharwal A, Goyal B, Unni S. Effect of Lockdown due to COVID-19 on Psychological Health of Young Adults-A Survey Report. *The Journal of Medical Research.* 2020;6(5), pp. 203–211. Available at: [www.medicinearticle.com](http://www.medicinearticle.com) (Accessed: 15 December 2021).
4. Islam SMD, Bodrud-Doza M, Khan RM, Haque MA, Mamun MA. Exploring COVID-19 stress and its factors in Bangladesh: A perception-based study. *Heliyon.* 2020;6(7):e04399. Published 2020 Jul 10. doi:10.1016/j.heliyon.2020.e04399.
5. Islam SMD, Bodrud-Doza M, Khan RM, Haque MA, Mamun MA. Exploring COVID-19 stress and its factors in Bangladesh: A perception-based study. *Heliyon.* 2020;6(7):e04399. Published 2020 Jul 10. doi:10.1016/j.heliyon.2020.e04399.
6. Mullick MS, Goodman R. Questionnaire screening for mental health problems in Bangladeshi children: a preliminary study. *Soc Psychiatry Psychiatr Epidemiol.* 2001;36(2):94-99. doi:10.1007/s001270050295.
7. Du F, He L, Francis MR *et al.* Associations between parent-child relationship, and children's externalizing and internalizing symptoms, and lifestyle behaviors in China during the COVID-19 epidemic. *Sci Rep.* 2021;11:23375. <https://doi.org/10.1038/s41598-021-02672-7>.
8. Mallik CI, & Radwan RB. Psychiatric disorders among 14-17 years school going Bangladeshi adolescents. *International Journal of Psychiatry Research.* 2020. [https://www.safetylit.org/citations/index.php?fuseaction=citations.viewdetails&citationIdscitjournalarticle\\_652197\\_18](https://www.safetylit.org/citations/index.php?fuseaction=citations.viewdetails&citationIdscitjournalarticle_652197_18).
9. Ravens-Sieberer U, Kaman A, Erhart M, Devine J, Schlack R, Otto C. Impact of the COVID-19 pandemic on quality of life and mental health in children and adolescents in Germany. *Eur Child Adolesc Psychiatry.* 2021;1-11. doi:10.1007/s00787-021-01726-5.
10. Silk J, Scott L, Hutchinson E, Lu C, Sequeira S, McKone KM, Ladouceur C. Storm Clouds and Silver Linings: Day-to-Day Life in COVID-19 Lockdown and Emotional Health in Adolescent Girls. *J Pediatr Psychol.* 2021;jsab107.
11. Hikmah K, Prisandy L, Melinda G, & Ayatullah M. An Online Survey: Assessing Anxiety Level among General Population during the Coronavirus Disease-19 Pandemic in Indonesia. *Open Access Macedonian Journal of Medical Sciences.* 2020; 8(No. T1), 451-8.



12. Khan AH, Sultana MS, Hossain S, Hasan MT, Ahmed HU, & Sikder MT. The impact of COVID-19 pandemic on mental health & wellbeing among home-quarantined Bangladeshi students: A cross-sectional pilot study. *Journal of Affective Disorders*. 2020;277,121–128. <https://doi.org/10.1016/j.jad.2020.07.135>.

UNDER PEER REVIEW