

# Impact of COVID-19 pandemic on the mental health of children in Bangladesh: A cross-sectional study

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## ABSTRACT

COVID-19 pandemic poses a significant mental health threat among children in Bangladesh. This study aims to explore the impact of COVID-19 on the mental health of children during the lockdown in Bangladesh. An online cross-sectional study was conducted from 25th April to 9th May 2020 among 384 parents having at least one child aged between 5–15 years using non-probability sampling. K-means clustering used to group children according to mental health score and confirmatory factor analysis (CFA) performed to identify the relationship among the parental behavior and child mental health, and also these associations were assessed through chi-square test. Children were classified into four groups where 43% of child had subthreshold mental disturbances (mean Major Depressive Disorder (MDD)-10; 2.8), 30.5% had mild (mean MDD-10; 8.9), 19.3% suffered moderately (mean MDD-10; 15.9), and 7.2% of child suffered from severe disturbances (mean MDD-10; 25.2). The higher percentage of mental health disturbances of children with the higher education level of parents, relative infected by COVID-19 (yes), parents still need to go the workplace (yes), and parent's abnormal behavior but lower to their counterparts. This paper demonstrates large proportions of children are suffering from mental health disturbances in Bangladesh during the period of lockdown. Implementation of psychological intervention strategies and improvement in house-hold financial conditions, literacy of parents, taking care of children, and job security may help in improving the psychological/mental status of children and the authors believe that the findings will be beneficial to accelerate the rate of achieving the Sustainable Development Goal (SDG) linked to health status in Bangladesh.

## 1. Introduction

The outbreak of novel coronavirus disease 2019 (COVID-19) has emerged in China, which rapidly spread the oddment of the world, and WHO declared it as a pandemic (Liu et al., 2020). The pandemic has been escalating and threatening the welfare of human beings globally and already transmitted to more than 14 million people around the globe with at least 597,583 deaths as of July 19, 2020 (World Health Organization, 2020a). To halt the COVID-19 transmission and cease the burden on health systems all most all of the countries have brought unprecedented efforts to institute the practice of “social distancing”, as a result, many schools have been closed (Dalton, Rapa, & Stein, 2020; Lancker & Parolin, 2020) and classes are shifted to home-based

distance-learning models (Golberstein et al., 2020). Children are not beyond the grasp of this pandemic, and also the most vulnerable to the drastic effects of it, as they are forced to stay home for extended periods due to lockdown and school closure, resulting in minimal interaction with peers and decreased the opportunities for exploration and physical activities (Jiao et al., 2020). All of these adversely impact children's mental health and welfare, leading to a wide variety of mental health issues, such as anxiety, stress, depression, and sleeping difficulties (Dunleavy, 2020; Galvin, 2020; Ramchandani, 2020; Rawstrone, 2020).

To prevent the outbreak of COVID-19, Bangladesh have been closed the academic institutions, therefore, about 3.7 million students and more than a million teachers are staying at home (Ahmed, 2020). Although the scientific controversy is unremitting concerning the

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effectiveness of school closures on virus transmission (Cohen & Kupferschmidt, 2020; Lancker & Parolin, 2020). Schools play an emergent role, not just in supplying educational resources to children, but also in offering students an opportunity to communicate with teachers and receive psychological counseling (Brazendale et al., 2017). Moreover, evidence shows that whenever children are beyond schooling (e.g. weekends and summer payday's), they become physically less active, have much-prolonged screen time, irregular sleep schedules and less healthy diets, resulted in excess weight and lack of cardio-respiratory performance (Brazendale et al., 2017; Wang et al., 2019; Wang, Zhang, Zhao, Zhang, & Jiang, 2020). Furthermore, pandemic stressors such as terror of infection, dissatisfaction and boredom, lack of knowledge, lack of personal space at home, and family's financial loss may have even more troublesome and enduring impacts on children mental health (Brooks et al., 2020).

To assess the impact of home quarantine on children's mental health, a study was performed among 1800 Chinese children and identified that one in five children (20 percent) in China was either suffering from depression or anxiety, or both (Dunleavy, 2020). Also, mental health issues remain fairly elevated among U.S. children due to the COVID-19 pandemic. According to the Centers for Disease Control and Prevention, 4.4 million children between the ages of 3 to 17 years have been diagnosed with anxiety and 1.9 million have been identified with depression because of home quarantine due to COVID-19. Moreover, about three in four children having depression along with anxiety (Galvin, 2020). The effect of the COVID-19 pandemic on children's mental well-being is worrying 60% of parents, according to a survey by parents with primary-aged children and 87% reported that their children were missing school and less than half stated that their children were feeling lonely, which altogether affects their children's mental health and wellbeing (Rawstrone, 2020).

In Bangladesh, as the number of COVID-19 cases continues to rise thus an immediate public health response is urgently needed (Banik et al., 2020). Consequently, the government of Bangladesh enforced full lockdown and all schools were closed from May 17, 2020 (Kamruzzaman & Sakib, 2020), which negatively impact children's wellbeing through interruption of their health care, nutrition, security, education, and overall mental health (Joining Force Bangladesh, 2020). Yet, there is no literature available in Bangladesh on the long-term impact of COVID-19 pandemic on children's mental health. Thus, it becomes important to determine how extended school closures, stringent social distancing steps and the pandemic itself have impacts on the mental health status of children. Therefore, this study aimed to investigate the impact of the COVID-19 pandemic on mental health and determining the associated factors among children of Bangladesh.

## 2. Materials and methods

### 2.1. Participants and setting

This study was conducted among parents having children in Bangladesh through an online survey between 25th April to 9th May 2020 after completing 30 days of home-quarantine following lockdown declaration on 26th March 2020 by the Government of Bangladesh (World Health Organization, 2020b). Here, non-probability sampling (Purposive sampling) techniques were used to collect the primary data from participants. Firstly, parents who had at least one child aged between 5 and 15 years, known to the researchers by their Facebook friends were invited to complete the survey by filling the questionnaire. We have calculated the sample size using the following formula

$$n = \frac{z^2 \times p \times (1 - p)}{d^2}$$

where we considered  $z = 1.96$  and  $d = 0.05$  confidence interval at 0.05. The sample proportion was assumed as 0.5 since this value provide the maximum sample size. Hence, the required sample size was

384. However, a total of 387 respondents completed the survey and after cleaning the incomplete responses 384 participants were taken for final analysis.

### 2.2. Data collection procedure

The primary data was collected via an online questionnaire as the face-to-face interview had to be avoided due to ongoing lockdown. The questionnaire was pilot-tested in a sample of 40 subjects before the final study initiation. We sent the link of designed google form to the parents randomly and the inclusion criteria were having at least one child aged between 5 and 15 years. The questionnaire consisting of several parts such as (i) socio-demographic information (age, sex, educational level, place of living, number of earning members in the family, average monthly family income, knowledge about COVID-19, and any family member/relatives/neighbor of the respondent was Corona positive or not), (ii) financial and lifestyle information of parents, (iii) information related to child's activity and attitude of parents toward child and (iv) mental health related information of child. Participants were given no economic motivation, and anonymity was maintained to make sure data confidentiality. First of all, asking the consent of participating in the survey and it was also notified that at any time, participants could revoke from the survey without giving any justification. This study was carried out online in full conformity with the provisions of the Helsinki Declaration on human participant research.

### 2.3. Mental health assessment of child

The 47-item Revised Child Anxiety and Depression Scale (RCADS) (Chorpita et al., 2000) includes the 10-item Depression Total scale in order to measure children's Major Depressive Disorder (i.e., the child feels sad or empty, nothing is much fun, trouble in sleeping, problems with appetite, no energy for things, tired a lot, cannot think, feels worthless, doesn't want to move, & feels restless). Children's anxiety was assessed by the Generalized Anxiety Disorder (GAD) scale with the help of Spence Child Anxiety Scale for Parents (SCAS-P) (Nauta et al., 2004). Also, GAD6 is a 6-item questionnaire (e.g. My child worries about things, complains of having a funny feeling in his/her stomach, complains of feeling afraid, heart beating fast, child worries that something bad will happen, & feels shaky). Parent-reported Child Behavior Checklist (CBCL) (Achenbach & Edelbrock, 1983), a questionnaire to assess children's behavior/emotional problems at ages of 5–15 years. A "sleep problem scale" was ascertained by six items from the CBCL ("experiences nightmares," "sleeps less than most children," "sleeps more than most children," "talks or walks in sleep," "trouble sleeping," and "overtired").

The MDD-10 and GAD-6 scales are evaluated at 4-points (0 = Never, 1 = Once in a week, 2 = 2–4 times in a week, & 3 = Everyday) which gives a total score of 0–30 and 0–18 respectively. Moreover, SDS-6 used a 3-point scale (0 = not true; 1 = sometimes true; 2 = very true/often true) which gives a total score of 0–12. The higher scores indicate higher level of depression, anxiety, and sleeping disorder. The acceptable reliability test was performed and the value of Cronbach alpha was 0.814 which is more than the acceptable value of 0.70.

### 2.4. Statistical analysis

Firstly, descriptive statistics were performed to describe the basic demographic characteristics of the respondents. Secondly, K-means clustering analysis was applied to cluster depression, anxiety, and sleeping disorder scores (Kang et al., 2020) of a child. The chi-square test was used to measure the association of socio-demographic variables, parental behavior towards children, and child mental health scores among the cluster. Thirdly, a confirmatory factor analysis (CFA) was constructed to explore the components associated with child

**Table 1**  
Socio-demographic characteristic of parents and children.

Variables		Number	Percentage (%)
Sex	Female	157	40.9
	Male	227	59.1
Age	< 25 years	10	2.6
	26–35 years	143	37.2
	36–45 years	179	46.6
	46–55 years	44	11.5
	> 55 years	8	2.1
Educational Level	Primary	37	9.6
	S.S.C/H.S.C	97	25.3
	Graduation	105	27.4
	Post-Graduation	136	35.4
Place of Living	PhD	9	2.3
	Rural	141	36.7
	Urban	243	63.3
Do you have any job right now?	No	168	43.7
	Yes	216	56.3
Are you tensed about your financial condition?	No	124	32.3
	Yes	260	67.7
Still, need to go to the workplace?	No	287	74.7
	Yes	97	25.3

mental health. Finally, a structural model was developed using the identified components of child mental health (Hu & Bentler, 1998). The significance level is set at a p-value < 0.05 here. Data analysis is performed using IBM SPSS Statistics for Windows (Version 23.0), IBM SPSS Amos (Version 23.0), and Microsoft Excel (Version 2016).

### 3. Results

Among the participants, there are 157 (40.9%) female and 227 (59.1%) male respondents. The majority of the participants tended to be aged 36–45 years (46.6%), had an educational level of post-graduation (35.4%), and lived in the urban areas (63.3%). A total of 56.3% of the respondents were involved in a job during the lockdown, where 25.3% of participants needed to go to the workplace, and a total of 67.7% were tensed about their financial condition because of the COVID-19 pandemic [Table 1].

The depression, anxiety, and sleeping disorder scores of children were classified into 4 groups (sub-threshold, mild, moderate, and severe disturbance) using k-means clustering. Results depict that 43% of child had subthreshold mental health disturbances (mean depression: 2.8, anxiety: 2, and sleeping disorder: 1), 30.5% had mild disturbances (mean depression: 8.9, anxiety: 4.9, and sleeping disorder: 3), 19.3% suffered from moderate disturbances (mean depression: 15.9, anxiety: 9.2, and sleeping: 6), and 7.2% suffered from severe disturbances (mean depression: 25.2, anxiety: 13.4, and sleeping disorder: 8). Significant differences found in the depression, anxiety, and sleeping disorder scores of the child among the four groups using the chi-square test, as shown in Table 2.

The Chi-square test was used to find significant differences in several characteristics among the four groups. Results reported that there were no significant differences in sex and age of the parents among the four groups. But significant differences found in the educational level of parents, place of living, any relative/neighbor of child having status positive or not by corona virus among the four groups. In the severe

disturbance group, most of the child's parents were graduated 10 (35.7%). The depression, anxiety, and sleeping disorder score were higher for a child whose family lived in the urban areas (63.3%). The child had higher mental health disturbance scores who had higher corona positive relative/neighbor [Table 3].

The result also showed that there was a significant difference in parents needed to go to the workplace or not, any chance of losing the job, and did smoke or not among the four groups. Higher the number of parents of the child needed to go to the workplace (25%), had a smoking habit (35.7%) and had the chance of losing their job (28.6%) higher the score of depression, anxiety, and sleeping disorder of child. The score was also found higher for the child who fights frequently with each other, child who watched the cartoon and played the game 2–4 hours using a smartphone or other electronic device in a day, child whose parents didn't take any action to keep them busy, child who complained their parents remained busy, child whose parents called them by name that they (children) didn't like, child whose parents threatened them to be punished, child whose parents screamed and hit them (child) during the home-quarantine period [Table 3].

The average score of depression, anxiety and sleeping disorder by different groups are presented in Fig. 1 and it can be seen that the average score of depression, anxiety, and sleeping disorder of child is increased gradually from subthreshold disturbance group to severe disturbance group [Fig. 1]. In CFA, the authors proposed four latent variables. First variable is related to parental mental health including the participant's educational level, place of living, average family income, any relatives/neighbor with suspected symptoms, tensed about the financial condition, feel bored by staying home during this home-quarantine. Second variable i.e., information related to participant's children consisted of number of children in the family of aged between 5–15 years and the number of school-going children. Third, parent's attitudes toward their child and child activity during home-quarantine consisted of children fight more with each other, threats to children, screaming with children, and slapping to the child. The fourth variable was child mental health consisted of the Depression, Anxiety, and Sleeping disorder scores of children. A first-order CFA model developed to examine the relationship between these four factors. The path coefficients connecting the items to the factors represent the factor loadings and standardized coefficients may also be interpreted.

The chi-square test of the model fit yielded a value of 151.890, with degrees of freedom = 84, P-value < 0.001. The results of chi-square test, RMSEA = 0.046, CFI = 0.954, and TLI = 0.942 signaling that the model is well-fitted to data and hence, it is concluded that the assumed model is correct. The results disclosed that the child mental health is affected by the parental mental health as well as parents' attitudes towards child. The results are presented in Fig. 2 and Table 4.

### 4. Discussion

Mental health is an essential part of any country and ignored particularly in low and middle-income countries (Patel, 2007). Bangladesh is a relatively small country according to area however having huge population with inadequate mental health care facilities for children and most hospitals use outpatient services. The largest part of the respondents was aged between 26 and 45 years and most of them were living in the urban areas and majorities are males (Table 1). In this

**Table 2**  
Cluster Analysis Grouping.

Variables	Subthreshold	Mild	Moderate	Severe	p-value
Number (Percentages)	165 (43%)	117 (30.5%)	74 (19.3%)	28 (7.2%)	
Depression M (SD)	2.8 (2.0)	8.9 (2.4)	15.9 (3.0)	25.2 (3.2)	< 0.001
Anxiety M (SD)	2 (2.0)	4.9 (2.6)	9.2 (3.4)	13.4 (3.5)	< 0.001
Sleeping M (SD)	1 (1.4)	3 (1.8)	6 (2.3)	8 (2.6)	< 0.001

**Table 3**  
Comparison of different characteristic among the different cluster.

Variables	Category	Cluster N (%)					p-value
		Subthreshold	Mild	Moderate	Severe	Total	
Sex	Female	75 (45.5%)	46 (39.3%)	28 (37.8%)	8 (28.6%)	157 (40.9%)	0.310
	Male	90 (54.5%)	71 (60.7%)	46 (62.2%)	20 (71.4%)	227 (59.1%)	
Age	< 25 years	4 (2.4%)	5 (4.3%)	1 (1.4%)	0 (0%)	10 (2.6%)	0.614
	26–35 years	66 (40%)	40 (34.2%)	29 (39.2%)	8 (28.6%)	143 (37.2%)	
	36–45 years	73 (44.2%)	54 (46.2%)	37 (50%)	15 (53.6%)	179 (46.6%)	
	46–55 years	19 (11.6%)	15 (12.8%)	7 (9.4%)	3 (10.7%)	44 (11.5%)	
	> 55 years	3 (1.8%)	3 (2.5%)	0 (0%)	2 (7.1%)	8 (2.1%)	
Educational Level	Primary	10 (6.1%)	11 (9.4%)	15 (20.3%)	1 (3.6%)	37 (9.6%)	0.019
	S.S.C/H.S.C	36 (21.8%)	26 (15.8%)	26 (35.1%)	9 (32.1%)	97 (25.3%)	
	Graduation	52 (31.5%)	32 (19.4%)	13 (17.6%)	8 (28.6%)	105 (27.4%)	
	Post-Graduation	63 (38.2%)	44 (26.7%)	19 (25.6%)	10 (35.7%)	136 (35.4%)	
	PhD	4 (2.4%)	4 (2.4%)	1 (1.4%)	0 (0%)	9 (2.3%)	
Place of Living	Rural	44 (26.7%)	48 (41%)	35 (47.3%)	14 (50%)	141 (36.7%)	0.003
	Urban	121 (73.3%)	69 (59%)	39 (52.7%)	14 (50%)	243 (63.3%)	
Relatives/Neighbor infected with Corona	No	147 (89.1%)	103 (88%)	64 (86.5%)	19 (67.9%)	333 (86.7%)	0.022
	Yes	18 (10.9%)	14 (12%)	10 (13.5%)	9 (32.1%)	51 (13.3%)	
Average Family income (in Taka)	< 20,000	14 (8.5%)	24 (20.5%)	18 (24.3%)	3 (10.7%)	58 (15.1%)	0.053
	30,000–40,000	20 (12.1%)	23 (19.7%)	13 (17.6%)	4 (14.3%)	60 (15.6%)	
	40,000–50,000	30 (18.2%)	15 (12.7%)	8 (10.8%)	6 (21.4%)	59 (15.5%)	
	20,000–30,000	32 (19.4%)	23 (19.7%)	14 (18.9%)	7 (25%)	76 (19.8%)	
	50,000 +	69 (81.8%)	32 (27.4%)	21 (28.4%)	8 (28.6%)	130 (34%)	
Still, need to go to the workplace?	No	133 (80.6%)	79 (67.5%)	44 (59.5%)	21 (75%)	287 (74.7%)	0.001
	Yes	32 (19.4%)	28 (32.5%)	30 (40.5%)	7 (25%)	97 (25.3%)	
Any chance of losing a job?	No	154 (93.3%)	97 (82.9%)	61 (82.4%)	20 (71.4%)	332 (86.5%)	0.019
	Yes	11 (6.7%)	20 (17.1%)	13 (17.6%)	8 (28.6%)	52 (13.5%)	
Feeling bored by staying at home?	No	19 (11.5%)	14 (12%)	18 (24.4%)	6 (21.4%)	57 (14.8%)	0.091
	Sometimes	75 (45.5%)	51 (43.6%)	28 (37.8%)	15 (53.6%)	169 (44%)	
Are you a smoker?	Yes	71 (43%)	52 (44.4%)	28 (37.8%)	7 (25%)	158 (41.2%)	0.049
	No	141 (85.5%)	93 (79.5%)	62 (83.8%)	18 (64.3%)	314 (81.8%)	
	Yes	24 (14.5%)	24 (20.5%)	12 (16.2%)	10 (35.7%)	70 (18.2%)	
How many hours (in a day) child watch cartoon?	< 2 h	93 (56.4%)	66 (56.3%)	34 (46%)	3 (10.7%)	196 (51%)	< 0.001
	2–4 h	56 (33.9%)	31 (26.5%)	33 (44.5%)	16 (57.2%)	136 (35.4%)	
	4–6 h	13 (7.9%)	18 (15.4%)	6 (8.1%)	7 (25%)	44 (11.5%)	
	6–8 h	3 (1.8%)	1 (0.9%)	1 (1.4%)	2 (7.1%)	7 (1.8%)	
	> 8 h	0 (0%)	1 (0.9%)	0 (0%)	0 (0%)	1 (0.3%)	
How many hours (in a day) child play games using smartphone or other electronic device?	< 2 h	124 (75.2%)	80 (68.4%)	49 (66.2%)	4 (14.3%)	257 (67%)	< 0.001
	2–4 h	31 (18.8%)	27 (23.1%)	19 (25.6%)	12 (42.8%)	89 (23.2%)	
	4–6 h	8 (4.8%)	8 (6.7%)	5 (6.8%)	11 (39.3%)	32 (8.3%)	
	6–8 h	1 (0.6%)	1 (0.9%)	1 (1.4%)	1 (3.6%)	4 (1.0%)	
	> 8 h	1 (0.6%)	1 (0.9%)	0 (0%)	0 (0%)	2 (0.5%)	
Do your child fight more with each other?	No	115 (69.7%)	55 (47%)	30 (40.5%)	8 (28.6%)	208 (54.2%)	< 0.001
	Yes	50 (30.3%)	62 (53%)	44 (59.5%)	20 (71.4%)	176 (45.8%)	
Did you take any action to keep him/her busy during lock-down?	No	29 (17.6%)	28 (24%)	26 (35.1%)	12 (42.9%)	95 (24.7%)	< 0.001
	Yes	136 (82.4%)	89 (76%)	48 (64.9%)	16 (57.1%)	289 (75.3%)	
Do you think your child is acting normal as before lock-down?	No	14 (8.5%)	20 (17.1%)	20 (27.1%)	10 (35.7%)	64 (16.6%)	< 0.001
	Not noticeable	34 (20.5%)	36 (30.8%)	24 (32.4%)	10 (35.7%)	104 (27.1%)	
	Yes	117 (71%)	61 (52.1%)	30 (40.5%)	8 (28.6%)	216 (56.3%)	
Did your child complain that you still remain busy with your work during this lockdown too?	No	136 (82.4%)	71 (60.7%)	38 (51.4%)	12 (42.9%)	257 (67%)	< 0.001
	Yes	29 (17.6%)	46 (39.3%)	36 (48.6%)	16 (57.1%)	127 (33%)	
Do you call your child by name (lazy, dumb etc.) that he/she doesn't like?	No	138 (83.6%)	86 (73.5%)	40 (54.1%)	10 (35.7%)	274 (71.4%)	< 0.001
	Yes	27 (16.4%)	31 (26.5%)	34 (45.9%)	18 (64.3%)	110 (28.6%)	
Do you threat your child that you will punish for improbity during lock-down?	No	119 (72.1%)	77 (65.8%)	35 (47.3%)	5 (17.9%)	236 (61.5%)	< 0.001
	Yes	46 (27.9%)	40 (34.2%)	39 (52.7%)	23 (82.1%)	148 (38.5%)	
Did you scream to your child during lock-down?	No	119 (72.1%)	61 (52.1%)	34 (45.9%)	3 (10.7%)	217 (56.5%)	< 0.001
	Yes	46 (27.9%)	56 (47.9%)	40 (54.1%)	25 (89.3%)	167 (43.5%)	
Did you you're your child during lock-down?	No	147 (89.1%)	97 (82.9%)	53 (71.6%)	13 (46.4%)	310 (80.7%)	< 0.001
	Yes	18 (10.9%)	20 (17.1%)	21 (28.4%)	15 (53.6%)	74 (19.3%)	
Did you hit your child using object during lock-down?	No	156 (94.5%)	107 (91.5%)	48 (64.9%)	10 (35.7%)	321 (83.6%)	0.003
	Yes	9 (5.5%)	10 (8.5%)	26 (35.1%)	18 (64.3%)	63 (16.4%)	
Which one you think is the most common in child abuse?	Emotional abuse	47 (28.5%)	39 (33.3%)	27 (36.5%)	9 (32.1%)	122 (31.7%)	0.017
	Family violence	39 (23.6%)	19 (16.2%)	13 (17.6%)	5 (17.9%)	76 (19.8%)	
	Neglect abuse	20 (12.1%)	13 (11.1%)	17 (23%)	4 (14.3%)	54 (14.1%)	
	Physical abuse	47 (28.5%)	36 (30.9%)	12 (16.1%)	3 (10.7%)	98 (25.5%)	
	Sexual abuse	12 (7.3%)	10 (8.5%)	5 (6.8%)	7 (25%)	34 (8.9%)	

N = Number of observations per cluster.

study, children's mental health (depression, anxiety, and sleeping disorder) scores were classified into four groups: sub-threshold, mild, moderate, and severe disturbance. The highest percentage of children are suffering from sub-threshold disturbance (43%), and 30.5% had

mild disturbances, 19.3% had moderate disturbances, and 7.2% had severe disturbances (Table 2). The education level of parents of children, place of living, relatives/neighbors infected with Covid-19, still need to go to the workplace of parents, the chance of losing jobs of



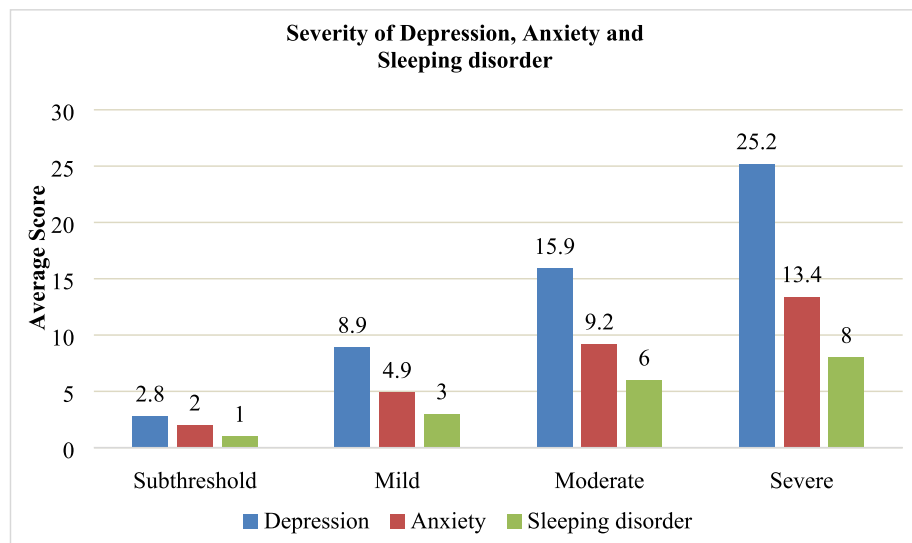


Fig. 1. Bar diagram representing the average score of depression, anxiety, and sleeping disorder among different cluster.

parents, the smoking habit of parents, hours watching the cartoon by children, children playing games, child fight, keeping busy with other works, acting of the child, children complain about parent's busyness, parent's abnormal behavior to children (call dumb, threat, scream, hit the child), and parent's knowledge about child abuse were significantly associated with children mental status (Table 3).

Children who live in urban areas with their parents were more prone to suffer mental health-related problems as compared to the rural area's child. Perhaps the reason behind this scenario is that the lockdown was perfectly maintained in urban areas and children were forced to stay home anyway (The Business Standard, 2020). On the contrary, children in rural areas are free to move and can play with their relatives/friends (Anwar, Nasrullah, & Hosen, 2020; Ranscombe, 2020).

Children brought up in a rural environment, encompassed by animals and bacteria, grow stronger immune systems and might be at minor risk of mental illness than without pet-city inhabitants, as indicated in a study (Hindustan Times, 2020).

Usually, educated parents remain busy with their jobs as compared to uneducated ones even during this lockdown period in Bangladesh, especially the government officials (Ahmed, 2020). As a result, they cannot manage time to communicate with their children as they demand. A bunch of social and personal adjustments is necessary to cope with this situation (Poduval & Poduval, 2009). If the work time of mother is longer, then the risks of children who are matured from one to five tended to increase child risks of experiencing psychological distress tended to increase the child risks of experiencing psychological

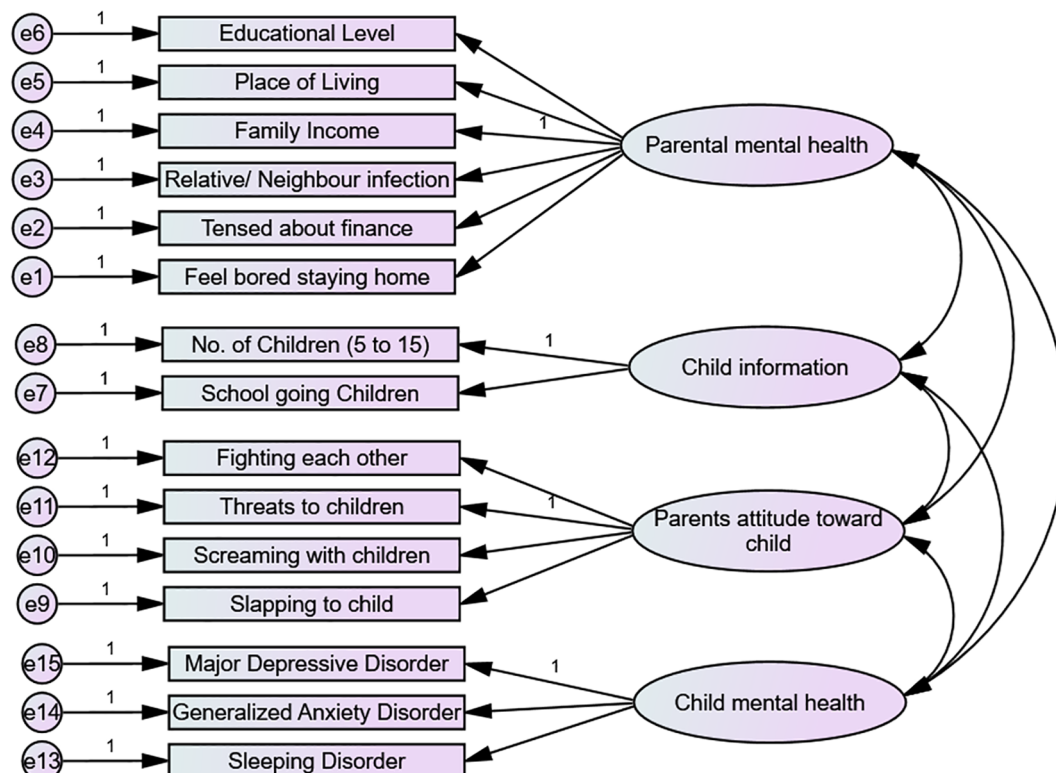


Fig. 2. A path diagram of Confirmatory Factor Analysis (CFA) representing the factors of the child mental health.

**Table 4**  
Inter-correlations and covariance are among Latent Variables in the Structural Model.

Relationship			Estimate	S.E.	P-value
Parental mental health	↔	Child information	− 0.073	0.048	0.133
Parental mental health	↔	Parents attitude toward child	− 0.145***	0.030	< 0.001
Parental mental health	↔	Child mental health	− 1.686***	0.487	< 0.001
Child information	↔	Child mental health	0.302	0.237	0.202
Child information	↔	Parents attitude toward child	0.042***	0.015	0.005
Parents attitude toward child	↔	Child mental health	1.187***	0.168	< 0.001

distress as a young adult (Francesconi & Ermisch, 2000). The findings of this paper are also congruent with a previous study (Poduval & Poduval, 2009).

Parents who want to income more or who have higher family income need to give more time to their jobs or company even if they feel pressure to manage the company's activities like workers' activity, managerial team activity, and so on (Mendez et al., 2004). A longer period of part-time job mothers reduced the children's educational attainment and increase their child's mental distress but this effect was lower as compared to full-time employment mothers (Saha et al., 2019). In our study, it is also found that the children of higher-income parents are more likely to have mental disorders than others.

Parents who still need to go to the workplace and have a chance of losing jobs tended to increase the level of mental disorders of their children whereas it decreases for their counterparts. Besides, parents whose feelings bored were tended to be more mental disturbances of their children as compared to their counterparts (Table 3). The pressure that guardians bring home from their occupations can diminish their child-rearing abilities, sabotage the climate in the home, and in this way bring worry into kids' lives. Moreover, children also feel pressure from their parents and becoming mentally sick (Heinrich, 2014). Unfortunately, low-income parents are most apparent to work in stressful, low-quality jobs that prominence low pay, little autonomy, inflexible hours, and few or no benefits (Heinrich, 2014; Waldfogel, Craigie, & Brooks-Gunn, 2010). It is well known that there is a strong association between a parent's smoking habits and child development behavior. Since cigarette smoking is additionally connected with sadness, there are numerous unanswered inquiries regarding the interrelationship of these mental issues of children (Shimomura et al., 2020). The findings of this study also showed that parental depression and smoking behavior also linked to child mental disorder (Table 3).

The children's mental depression was relatively low who was busy with some works as compared to who was not (Table 3), which is very usual. Engaging with some works or encouraging daily exercise will help children to reduce depression (Hurley, 2020). Children, who fight with others and get threats, scream and hit from their parents were much mentally disordered and increased severe mental disturbances as compared to their counterparts. Because paternal and maternal behavior have an adjustment to children's mental health (Elgar et al., 2007). Parents who threats, scream, or hit to their children are depressive and these depressive symptoms of parents and emotional behavior affect the child's mental health (Gutierrez-Galve, Stein, Hanington, Heron, & Ramchandani, 2015; Jessee, Mangelsdorf, Shigeto, & Wong, 2012; Pereira, Barros, Mendonça, & Muris, 2014). Again, children who act normal were in less mental disturbances as compared to others where the percentage increased gradually from less mental disturbances to severe mental disturbances. Because if the children's sadness becomes interferes with social activities or regular life, it indicates that he or she has a depressive illness (Elgar, Mills, McGrath, Waschbusch, & Brownridge, 2007; Gutierrez-Galve et al., 2015).

## 5. Limitations of the study

This research has some limitations. Firstly, considering health threats, a face-to-face interview was avoided whereas compared to face-

to-face interviews, self-reporting has certain limitations. Secondly, this study did not track the efficacy of psychological services as a cross-sectional study. Finally, it would be better to have a larger sample size to validate the results but due to the current situation, it was not possible to collect samples on a large scale.

## 6. Conclusion

The results demonstrate that large proportions of children are suffering from mental health disturbances in Bangladesh during the lockdown period. Mothers', as well as fathers' ability to forestall their emotional pain or manifestation of depression from influencing their role as a parent, might be a significant source of resilience for their children. The vulnerable cohorts for this study are children with the urban areas, higher educated parents, both higher and lower family income, smoking status (yes), parental depressive symptoms (threat, scream, hit, etc.), and the abnormal acting of the child. Implementation of proper psychological intervention strategies and improvement in house-hold financial conditions, literacy of parents, taking proper care of children, and increasing job security and flexibility of parents may help in improving the psychological/mental status of children in Bangladesh and the authors believe that the findings will be beneficial to accelerate the rate of achieving the Sustainable Development Goals (SDGs) linked to public health in Bangladesh.

## CRedit authorship contribution statement

**Sabina Yeasmin:** Conceptualization, Data analysis, Writing - original draft. **Rajon Banik:** Conceptualization, Methodology, Writing - original draft. **Sorif Hossain:** Methodology, Writing - original draft. **Md. Nazmul Hossain:** Data analysis, Writing - original draft. **Raju Mahumud:** Data analysis, Writing - original draft. **Nahid Salma:** Supervision, Writing - review & editing. **Md. Moyazzem Hossain:** Conceptualization, Supervision, Writing - review & editing.

## Conflict of interest

The authors declare that they have no conflict of interests.

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## Ethical approval statement

This study is considered a primary data set and the participants were given no economic motivation, and anonymity was maintained to make sure data confidentiality and reliability. It was also notified that

at any time, participants could withdraw from the survey without giving any justification. The participants also provide their consent for publishing the analyzed results of this survey without their identifiable information. This study was carried out online in full conformity with the provisions of the Helsinki Declaration on human participant research.

## Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chidyouth.2020.105277>.

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