



Research article

Suicidal behaviors and suicide risk among Bangladeshi people during the COVID-19 pandemic: An online cross-sectional survey

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ABSTRACT

Background: Suicide, a major public health concern, is a leading cause of injury and death worldwide. The present study aims to assess suicidal behaviors and suicide risk among Bangladeshi people during COVID-19.**Methods:** A cross-sectional online survey was conducted from July 10 to July 20, 2020, involving 1,415 Bangladeshi residents ages 18 years or older. Data was collected via an anonymous online questionnaire. The Suicide Behaviors Questionnaire-Revised was used to assess suicide risk. The depression and anxiety subscales of the Depression Anxiety Stress Scale 21 were used to assess depression and anxiety. Logistic regression analyses and Pearson's correlation were performed to examine the association of variables.**Results:** The prevalence of suicide ideation and planning among Bangladeshi people during the COVID-19 pandemic was 19.0% and 18.5%, respectively. Having suicidal risk during the COVID-19 pandemic was reported by 33.5% participants. Suicide risk was associated higher with females, divorced or widowed marital statuses and low educational attainment (i.e., secondary or below and higher secondary/diploma). Additionally, living in high COVID-19 prevalent areas, having economic loss due to the COVID-19 pandemic, relatives or acquaintances die from COVID-19, direct contact with COVID-19 patient(s), and fear of COVID-19 infection were associated with suicide risk.**Conclusions:** The COVID-19 pandemic imposes significant psychological consequences on people, thus, concerned authorities should pay attention to people's mental health and focus on suicide prevention and awareness during and after the COVID-19 pandemic.

1. Introduction

The coronavirus disease 2019 (COVID-19), a severe acute respiratory illness caused by the new coronavirus strain Sars-CoV-2, has become a global public health crisis (Pal et al., 2020). The World Health Organization (WHO) declared the COVID-19 outbreak a pandemic on March 11, 2020 (Cucinotta and Vanelli, 2020). At the time of writing (August 8, 2020), this pandemic has affected 216 countries, areas, and territories with 19,187,943 confirmed cases and 716,075 deaths recorded globally (WHO, 2020b). On March 8, 2020, Bangladesh confirmed its first three cases of COVID-19 (The Daily Star, 2020a). Since then, the country keeps seeing a rise in the number of COVID-19 cases and deaths. There have

been 255,113 positive cases of COVID-19 in Bangladesh and 3,365 deaths reported domestically, as of August 8, 2020 (Institute of Epidemiology Disease Control and Research, 2020).

There is currently no approved vaccine to prevent COVID-19, or therapy to treat it (Centers for Disease Prevention and Control, 2020b). Most affected countries around the world have adopted non-therapeutic measures including lockdown, social distancing, self-isolation, or quarantine, in order to combat the spread of COVID-19 (Anwar et al., 2020). The Bangladeshi government declared a nationwide lockdown from March 26 to May 30, 2020 extending it seven times (The Daily Star, 2020a, 2020b). Schools, colleges, and universities have remained closed since March 18, 2020 (Dhaka Tribune, 2020a). Furthermore, the

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government has extended restrictions imposed on public activities and movement across the country until August 31, 2020 to limit the spread of COVID-19 (Dhaka Tribune, 2020b). The continuous spread of the virus, restrictions imposed on individuals' freedom, and increased media reporting are expected to have psychological impacts on individuals (Centers for Disease Control and Prevention, 2020a; Lee, 2020; WHO, 2020a).

The current COVID-19 pandemic is causing widespread concern, not only for physical health but also for mental health (Mazza et al., 2020). There is much evidence that many individuals during the COVID-19 pandemic developed symptoms of psychiatric disorders (Moser et al. 2020; Islam et al., 2020; Varshney et al., 2020; Wang and Zhao, 2020). The unpredictability of the pandemic and the uncertainty of when the situation will be under control have added pressure to individuals' mental health and leads to a spectrum of psychological consequences, ranging from common mental disorders, such as anxiety and depression (Huang and Zhao, 2020; Moghanibashi-Mansourieh, 2020), to committing suicide (Israfil Bhyiyan et al., 2020; Mamun and Griffiths, 2020).

Suicidal behaviors are a multifaceted phenomenon and include a wide range of behaviors, such as suicide ideation, planning, attempting, and completing suicide (De Berardis et al., 2018). Evidence suggests that deaths by suicide would increase during an infectious disease outbreak. For instance, suicidal deaths increased in the United States during the 1918–19 influenza pandemic (States and Wasserman, 1992), and in Hong Kong during the 2003 Severe Acute Respiratory Syndrome (SARS) epidemic (Cheung et al., 2008). According to a study conducted in the United States, 17.5% of participants reported suicide ideation, and 4.9% had attempted suicide during the current COVID-19 pandemic (Ammerman et al., 2020). Furthermore, a study conducted among a Colombian population showed that 7.6% of participants reported a high suicide risk during the COVID-19 pandemic using the CES-D scale (Center for Epidemiological Studies Depression Scale) (Caballero-Domínguez et al., 2020). Suicide also became an early concern for Bangladesh, as a publication noted the first COVID-19 related suicide case for the country due to fear concerns about the virus (Mamun and Griffiths, 2020). Thus, the relevance of an increased suicidal risk thanks to the pandemic has becoming increasingly concerning as more and more cases come about.

Given the expected impact of the current pandemic, it is important to investigate suicidal behaviors and suicide risk of people. This may help to develop measures and implement psychological interventions that have been adjusted accordingly to fit to the current pandemic situation as well as following it. To date, there is a paucity of research investigating suicidal behaviors and the suicide risk of people, during the COVID-19 pandemic, in Bangladesh. In the present study, we aimed to assess suicidal behaviors and suicide risk among Bangladeshi people during the COVID-19 pandemic.

2. Methods

2.1. Participants

This online cross-sectional survey was conducted to assess suicidal behaviors and suicide risk among Bangladeshi residents during the COVID-19 pandemic. The survey was conducted from July 10 to July 20, 2020, when the number of cases and deaths from COVID-19 was increasing in Bangladesh. The target population was the general Bangladeshi population. Inclusion criteria were being (i) a Bangladeshi resident, (ii) at least 18 years old, and (iii) able to read Bangla.

2.2. Procedures

Participants were recruited using convenience sampling from various social media platforms (e.g., Facebook, WhatsApp). An anonymous online questionnaire was used to collect data from the participants. First, the questionnaire was translated in Bangla (the native language of the participants), and then translated back to English by different experts

fluent in both languages. The survey was piloted on a sample of 50 to test its validity. The data from the pilot survey were not included in the final analysis. This online survey was conducted using a survey link created on a GoogleForm. All participants were informed about the survey's purpose and provided their informed consent before starting. A total of 1,452 respondents completed the survey. Among them, 37 participants were excluded, as they were below 18 years of age and therefore, data from 1,415 respondents were taken for final analysis.

2.3. Measures

2.3.1. Socio-demographic information

Participants were asked to report their age, gender, marital status, education level, occupation, monthly family income, and residence. For ease of analysis, age was categorized in two groups: 18 to 30 and >30 years old.

2.3.2. COVID-19 related factors

Data regarding COVID-19-related factors were collected to explore relationships with suicide risk. This section included 7 items: (1) number of COVID-19 patients diagnosed in living area (i.e., union or ward) (later categorized: low prevalence [reporting 0 to 50 COVID-19 cases] vs. high prevalence [reporting >50 COVID-19 cases]), (2) economic loss due to the COVID-19 pandemic (yes vs. no), (3) relatives or acquaintances infected with COVID-19 (yes vs. no), (4) relatives or acquaintances died from COVID-19 (yes vs. no), (5) direct contact with COVID-19 patient(s) (yes vs. no), (6) indirect contact with COVID-19 patient(s) (yes vs. no), and (7) fear of COVID-19 infection (yes vs. no).

2.3.3. Suicide behaviors questionnaire-revised (SBQ-R)

The SBQ-R (Osman et al., 2001) is a brief self-report measure for screening suicidal behaviors and suicide risk. The scale has been found to be reliable and valid in previous studies (Aloba et al., 2017; Amini-Tehrani et al., 2020; Rueda-Jaimes et al., 2017). The SBQ-R is composed of four items. The first item assesses lifetime suicide ideation and/or suicide attempt. The second item assesses the frequency of suicidal ideation over the preceding 12 months. The third item scans whether the subject has spoken to others about his suicidal thoughts or suicidal intent. Lastly, the fourth item assesses the self-reported probability of suicidal behaviors in the future. In order to evaluate the impact of COVID-19, the scale was adapted, asking for suicidal behaviors only in the last 4 months (time since the first case confirmed in Bangladesh). In the present study, item 1 answer #2 was used explicitly for suicidal ideation, and item 1 answers #3a and #3b had been used for suicide plan (Abdu et al., 2020). The total score of the SBQ-R ranges from 3 to 18, and a total score of 7 and higher indicates significant risk of suicidal behavior (Osman et al., 2001). In the present study, the Cronbach's alpha for the SBQ-R items was .79.

2.3.4. Depression Anxiety Stress Scale 21 (DASS-21)

The DASS-21 (Lovibond and Lovibond, 1995) is a widely used self-report instrument for screening depression, anxiety, and stress. This scale is also validated in Bangla (Alim et al., 2017). The scale is composed of 21 items divided equally with 7 items into 3 subscales of depression, anxiety, and stress. Items were scored on a four-point Likert scale ranging from 0 (*never*) to 3 (*always*). In the present study, we only used the depression and anxiety subscales of the DASS-21. In this study, the Cronbach's alpha for the DASS-21 depression subscale was .89; for the anxiety subscale it was .81.

2.4. Statistical analysis

Means and standard deviations (*SDs*) were calculated for continuous variables and frequencies for categorical variables. Binary logistic regression analysis was performed to determine the significant associations between various co-variants with suicide risk. The estimates of the

strengths of associations were demonstrated by the odds ratio (OR) with a 95% confidence interval (CI). The association of variables was considered statistically significant if the *p*-value was less than or equal to .05. Furthermore, a bivariate Pearson correlation was performed along with the total scores of SBQ-R, depression, and anxiety subscale to investigate the significant relationships with each other. Microsoft Excel 2019 was used for editing, sorting, and coding. The Statistical Package for Social Science (SPSS) IBM Statistics version 22.0 was used to carry out all statistical analyses.

2.5. Ethical considerations

The study was carried out in accordance with the Institutional Research Ethics and the Declaration of Helsinki or its comparable ethical standards. In addition, the study's protocol was approved by Sheikh Sayera Khatun Medical College, Gopalganj, Bangladesh (sskmc/ec/2020/623). Participants were well briefed about the procedure, purpose of the study, and told that their information would remain confidential. Participants were also informed that they had right to revoke data at any time from the study. Data was collected anonymously, and all participants provided informed consent.

3. Results

A total of 1,415 participants were included in the present study. The mean age of the participants was 25.42 years (± 8.78), ranging from 18 to 61 years. The majority of the participants were 18–30 years old (86.1%), male (61.8%), unmarried (77.2%), had a graduate or higher level of education (78.5%), and were students (62.0%). Most participants had monthly family incomes of >50,000 (Bangladeshi taka [BDT]) (19.1%) and 69.9% were urban residents (Table 2).

As shown in Table 1, suicide ideation was absent in 81.0% of the participants, while 19.0% of them reported suicidal ideation during the COVID-19 pandemic. Eighteen point five percent of the participants had made a plan during the COVID-19 pandemic to commit suicide. The overall estimate of suicide risk among the participants during the COVID-19 pandemic was 33.5%, considering the cut-off score as 7 for the SBQ-R.

In binary logistic regression, suicide risk was associated with female gender (OR = 1.893; 95% CI [1.511, 2.373], $p < .001$), divorced or widowed marital status (OR = 6.369; 95% CI [2.039, 19.887], $p = .001$), secondary or below education level (OR = 2.694; 95% CI [1.757, 4.129], $p < .001$), and higher secondary/diploma education level (OR = 1.690; 95% CI [1.250, 2.285], $p = .001$) (Table 2).

As shown in Table 3, the SBQ-R total score was positively along with significantly correlated with the score of DASS depression subscale ($r = .550$) and DASS anxiety subscale ($r = .443$).

The associations of COVID-19-related factors with suicide risk were reported in Table 4. The binary logistic regression analysis revealed four determining COVID-19-related factors for suicide risk: living in high COVID-19 prevalent areas (OR = 1.347; 95% CI [1.054, 1.721], $p = .017$), experiencing economic loss due to the COVID-19 pandemic (OR =

Table 1. Suicidal behaviors among Bangladeshi people during the COVID-19 pandemic.

Variables	Frequency	Percentage
Suicide ideation		
Yes	269	19.0
No	1146	81.0
Suicide planning		
Yes	262	18.5
No	1153	81.5
Suicide risk		
Yes	474	33.5
No	941	66.5

2.295; 95% CI [1.600, 3.294], $p < .001$), having relatives or acquaintances die from COVID-19 (OR = 1.299; 95% CI [1.011, 1.669], $p = .041$), and fear of getting a COVID-19 infection (OR = 1.309; 95% CI [1.046, 1.640], $p = .019$).

4. Discussion

The present study aimed to assess suicidal behaviors and suicide risk during the COVID-19 pandemic among Bangladeshi people. Studies have shown that suicidal behaviors increase during infectious disease outbreaks (Ammerman et al., 2020; Cheung et al., 2008; States and Wasserman, 1992). Suicide has also been strongly correlated with COVID-19 specific fears (Lee, 2020; Lee et al., 2020a). This study revealed the prevalence of suicide ideation and planning during the COVID-19 pandemic was 19.0% and 18.5%, respectively. The prevalence of suicide ideation was slightly higher in the present study than that reported among US residents during the COVID-19 pandemic (19.0% vs. 17.5%) (Ammerman et al., 2020). In a recent, pre-COVID-19 study conducted among university students in South West Ethiopia, the lifetime prevalence of suicidal ideation, planning, and attempting was reported to be 58.3%, and 37.3%, respectively (Abdu et al., 2020). The prevalence of suicidal behaviors (i.e., suicide ideation and planning) differs across studies, depending on the language and the methods used for the study as well as the duration of the study. Moreover, the prevalence of suicidal behaviors differs across countries, depending on the population's culture, race, social, economic, and religious features (Eskin et al., 2016; Peltzer et al., 2017).

The findings of the present study showed that 33.5% of participants reported suicide risk during the COVID-19 pandemic. Suicide risk can be described by integrating proximal factors such as physical and mental illness, and distal variables such as early traumatic life events, family history of suicide and introversion (Turecki and Brent, 2016). The events associated with an outbreak can be a major stressor for many individuals, and traumatic circumstances can increase suicidal risk along with pre-existing predisposing factors such as financial difficulties, emotional issues, and job loss. Mental health services can be expected to increase in the context of the COVID-19 pandemic (CDC, 2020a; WHO, 2020a).

Gender differences in suicide risk have been reported globally (Freeman et al., 2017; Mamun et al., 2020). In this study, the odds of having suicidal risk were higher among females than males. Females have been found to have a heightened sensitivity to emotions and tend to suffer greater from stressors when triggered by negative psychological consequences, like the death of friends or relatives, and these differences might have been associated with increased suicide risk among them (Droogenbroeck et al., 2018; Matheson et al., 2014). This study also showed that the odds of having suicidal risk were higher among those divorced or widowed compared to unmarried participants. In this study, participants with high level of education (i.e., graduation or higher) had higher odds of suicidal risk than others. In line with the findings of the present study, previous studies (Li et al. 2011; Pompili et al., 2013) indicated that individuals with higher educational achievement were more likely to be at risk of suicide. The discrepancies in results may be due to the current situation of COVID-19.

Suicide is a severe consequence of psychological disorders (Eskin et al., 2016). Psychological problems in response to COVID-19 have been expected (Lee et al., 2020b); as during disease outbreaks, people may develop depressive symptoms and anxiety following reports of deaths, increased media communications, and an escalating number of new cases (Lahav, 2020). This study showed that suicide risk was associated with depression and anxiety, which is in agreement with the results of other published studies (Abdu et al., 2020; Eskin et al., 2016).

It was also found in our study that suicide risk was associated with a number of COVID-19-related factors. This study showed that people living in high COVID-19 prevalent areas had higher odds of suicide risk compared to others. This may be due to the lock-down measures to control the spread of the COVID-19 in the highly affected areas.

Table 2. Associations of demographic variables with suicide risk.

Characteristics	Total (%) n = 1415	Suicide risk		Bivariate analysis		
		Yes (%)	OR	95% CI	p-value	
Age						
18–30	1219 (86.1)	420 (34.5)	1.382	[0.989, 1.932]	.058	
>30	196 (13.9)	54 (27.6)	1			
Gender						
Male	875 (61.8)	245 (28.0)	1			
Female	540 (38.2)	229 (42.4)	1.893	[1.511, 2.373]	<.001	
Marital status						
Unmarried	1093 (77.2)	350 (32.0)	1			
Married	306 (21.6)	112 (36.6)	1.226	[0.940, 1.598]	.133	
Divorced, widows, or widowers	16 (1.1)	12 (75.0)	6.369	[2.039, 19.887]	.001	
Education						
Secondary or below	93 (6.6)	50 (53.8)	2.694	[1.757, 4.129]	<.001	
Higher secondary/Diploma	211 (14.9)	89 (42.2)	1.690	[1.250, 2.285]	.001	
Graduate or higher	1111 (78.5)	335 (30.2)	1			
Occupation						
Student	878 (62.0)	291 (33.1)	3.470	[0.783, 5.371]	.101	
Housewife	46 (3.3)	17 (37.0)	4.103	[0.830, 20.284]	.083	
Government/private employee	208 (14.7)	76 (36.5)	4.030	[0.892, 18.212]	.070	
Doctor/healthcare worker	172 (12.2)	53 (30.8)	3.118	[0.684, 14.205]	.142	
Unemployed	95 (6.7)	35 (36.8)	4.083	[0.876, 19.030]	.073	
Others	16 (1.1)	2 (12.5)	1			
Monthly family income (BDT)						
<10,000	212 (15.0)	80 (35.7)	1			
10,000–20,000	224 (15.8)	79 (31.3)	1.103	[0.743, 1.638]	.626	
20,001–30,000	252 (17.8)	84 (35.6)	0.907	[0.614, 1.340]	.623	
30,001–40,000	236 (16.7)	86 (38.9)	1.097	[0.743, 1.621]	.640	
40,001–50,000	221 (15.6)	74 (27.4)	1.265	[0.854, 1.874]	.241	
>50,000	270 (19.1)	71 (33.5)	0.750	[0.507, 1.108]	.149	
Residence						
Rural	426 (30.1)	132 (31.0)	1			
Urban	989 (69.9)	342 (34.6)	1.177	[0.923, 1.502]	.189	

Note. OR: Odds ratio, CI: Confidence interval.

Moreover, it seems that people living in high density areas have a greater chance to get COVID-19 infection, which leads to developing increased suicide risk among the local residents. In addition to the national health situation, the pandemic has had a significant impact on the country's economy and its individuals (Ahmed, 2020; Israfil Bhuiyan et al., 2020). Because of the current pandemic, many individuals and families have lost their source of income (The World Bank, 2020), which may also lead to the prevalence and development of suicidal behaviors. In line with previous studies (Assari, 2018; Israfil Bhuiyan et al., 2020; Kim et al., 2016), this study showed that suicide risk was associated with economic loss due to the COVID-19 pandemic. We also found that people who reported having relatives or acquaintances die from COVID-19 had higher odds of suicide risk. This can be due to a variety of reasons. First, it could be that there is an increased risk of contracting the disease as they may have been in contact with the infected person. Second, they may be worried about the health condition of their family or friends. The COVID-19

Table 3. Correlations of suicide risk, depression, and anxiety for each other.

Variables	Suicide risk	Depression	Anxiety
Suicide risk	1	0.550**	0.443**
Depression	0.550**	1	0.616**
Anxiety	0.443**	0.616**	1

Note. ** Significant at the 0.01 level (2-tailed).

infection in humans causes a range of clinical presentations, from asymptomatic infection to acute respiratory infection and even death (Wang et al., 2020). Another finding of this study showed that fear of COVID-19 infection is associated with suicide risk, which has also been supported in literature (Mamun and Griffiths, 2020).

Overall, the COVID-19 pandemic creates an extra burden for the mental health of people. Although, Bangladesh's government has taken many measures in order to combat the spread of COVID-19, including isolating or quarantining, prohibiting all gathering activities, and forcing everyone to wear masks to enter public places, the mental health statuses of their people should also be prioritized as this pandemic persists.

4.1. Strength and limitations of the study

To date, there are no studies investigating suicidal behaviors and suicide risk among the general public during the COVID-19 pandemic, in Bangladesh. This study provides novel information regarding the impacts of COVID-19 related factors on individuals' suicidal risk. The findings of this study might be helpful for concerned authorities to plan and adopt appropriate interventions to overcome the negative psychological impacts to ensure sound mental health during the COVID-19 pandemic. The study can further assist in future research on psychological aspects of the general population.

The present study has a couple of limitations. First, this study relied on self-report measures, which may have been exposed to some potential biases (e.g., social desirability and memory recall). Second, this study

Table 4. Associations of COVID-19-related factors with suicide risk.

Variables	Total (%) n = 1415	Suicide risk Yes (%)	Bivariate analysis		
			OR	95% CI	p-value
Living area (based on COVID-19 case)					
Low prevalence	1038 (73.4)	329 (31.7)	1		
High prevalence	377 (26.6)	145 (38.5)	1.347	[1.054, 1.721]	.017
Economic loss due to the COVID-19 pandemic					
No	209 (14.8)	41 (19.6)	1		
Yes	1206 (85.2)	433 (35.9)	2.295	[1.600, 3.294]	<.001
Relatives or acquaintances infected with COVID-19					
No	588 (41.6)	206 (35.0)	1		
Yes	827 (58.4)	268 (32.4)	0.889	[0.711, 1.112]	.302
Relatives or acquaintances who died from COVID-19					
No	1062 (75.1)	340 (32.0)	1		
Yes	353 (24.9)	134 (38.0)	1.299	[1.011, 1.669]	.041
Direct contact with COVID-19 patient(s)					
No	1182 (83.5)	391 (33.1)	1		
Yes	233 (16.5)	83 (35.6)	1.119	[0.834, 1.502]	.452
Indirect contact with COVID-19 patient(s)					
No	984 (69.5)	325 (33.0)	1		
Yes	431 (30.5)	149 (34.6)	1.071	[0.844, 1.360]	.572
Fear of COVID-19 infection					
No	611 (43.2)	184 (30.1)	1		
Yes	804 (56.8)	290 (36.1)	1.309	[1.046, 1.640]	.019

Note. OR: Odds ratio, CI: Confidence interval.

was cross-sectional in nature and was unable to determine causality between any of the variables under investigation. In this respect, a longitudinal study would overcome this limitation. Additionally, the sampling method used was convenience sampling; and to participate in the survey, the respondents need to have internet access during the study period. This may have affected the generalizability of the findings. Therefore, a large-scale sampling design would be more appropriate in the future.

5. Conclusion

The COVID-19 pandemic imposes psychological consequences on people to a great extent. The findings of the present study suggest that sizable proportions of respondents had suicidal behaviors during the COVID-19 pandemic. Findings also showed that 33.5% of respondents had suicidal risk during the COVID-19 pandemic. This study also suggests that COVID-19-related factors had a significant impact on individuals' suicide risk. Therefore, authorities should pay attention to people's mental health and focus of suicide prevention and awareness during and after the COVID-19 pandemic.

Declarations

Author contribution statement

Md. Estiar Rahman: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Abdullah Al Zubayer: Conceived and designed the experiments; Performed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Md. Rifat Al Mazid Bhuiyan: Conceived and designed the experiments; Performed the experiments; Wrote the paper.

Mary C. Jobe: Conceived and designed the experiments; Wrote the paper.

Md. Kamrul Ahsan Khan: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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Data included in article.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

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