Research article

Factors associated with suicidal behavior among university students in Bangladesh after one year of COVID-19 pandemic

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A R T I C L E   I N F O

A B S T R A C T

Background: The COVID-19 outbreak spillovers mental health burden where suicide is a common psychological public health issue that affects people all over the world. This study aimed to explore the factors associated with suicidal behavior among university students in Bangladesh after one year of the COVID-19 outbreak.

Methods: An online cross-sectional survey was conducted among 2100 Bangladeshi university students aged $\geq$18 years from April 29 to May 15, 2021. The survey questionnaire contained socio-demographic information, COVID-19 related physical and psychosocial factors (CRPPF), preventive response to psychological stress, and the Suicidal Behaviors Questionnaire-Revised (SBQ-R) scale. Descriptive statistics along with logistic regression were performed for statistical analysis.

Results: About 47.90% of the students were at risk of suicidal behavior, and female students were very likely to be at risk of suicidal behavior than their male counterparts (AOR = 2.28; 95% CI: 1.86 to 2.81). Keeping distance from friends or family (AOR = 1.66; 95% CI: 1.34 to 2.04), having relationship problems (AOR = 2.20; 95% CI: 1.79 to 2.70), feeling own selves as burden to families (AOR = 2.50; 95% CI: 2.02 to 3.11), and being stressed of lockdown (AOR = 1.56; 95% CI: 1.19 to 2.03) were highlighted as some of the significant factors associated with increased risk of suicidal behavior.

Conclusion: University students were exposed to several factors that impose the risk of developing suicidal behavior. Concerned authorities should design & implement appropriate strategies for ensuring suicidal prevention besides their mental well-being.

1. Background

The COVID-19 was declared as a Public Health Emergency of International Concern by the World Health Organization on January 30, 2020 (Harapan et al., 2020). As of 17th December 2021 there had been 1,580, 559 confirmed COVID-19 cases with about 28,041 deaths in Bangladesh (World Health Organization, 2021). Recent evidence suggests that the coronavirus disease pandemic of 2019 (COVID-19) has significant psychological and social consequences (Sher et al., 2020). Suicidal behavior is also a significant psychological issue that varies by gender, age group, geographic region, and sociopolitical context, and is linked to a variety of risk factors (Turecki and Brent, 2016). A previous cross-sectional study of

university students disclosed that nearly 18% of the participants were at risk of suicidal behavior (Britton et al., 2014). A total of 5,572 university students from 12 nations were evaluated, and it was reported that about 29% of the samples had considered suicide and 7% had attempted suicide (Eskin et al., 2016). Suicidal behavior among graduate students is strongly characterized by melancholy, hopelessness, desperation, as well as lack of control (Garcia-Williams et al., 2014), and in addition, suicidal ideation along with behaviors are also linked to bullying victimization (Holt et al., 2015). Sadness was found to be linked to suicide conduct in Chinese female students (Tang et al., 2018). Depression, anxiety, and stress were all identified as key risk factors for suicide in another study of Chinese university students (Lew et al., 2019). A previous study in Greece revealed that there was 63.3 percent increase in suicidal thoughts among university students during COVID-19 pandemic (Kaparounaki et al., 2020). A prior research on university students in Poland during the COVID-19 outbreak also found that students aged 18–24 years had greater suicidal symptoms than students aged ≥25 years (Debowska et al., 2021). Fear of COVID-19, economic instability, insufficient access to healthcare facilities, pre-existing psychiatric problems and social isolation have all been recognized as prevalent risk factors for suicidal behavior during this COVID-19 pandemic (Raj et al., 2021). Survivors of COVID-19 may be at an increased risk of suicide (Sher et al., 2020).

Bangladesh is one of many countries that had been hit hardest by the COVID-19 pandemic imposing significant psychological consequences and highlighted that the prevalence of suicidal ideation and plan was reported by 19.0 % and 18.5% respectively among Bangladeshi people during the COVID-19 outbreak, and 33.5 % of participants reported being at danger of suicide (Rahman et al., 2021). In addition, during this pandemic, university students in Bangladesh are particularly mentally distressed due to the influence of COVID-19 outbreak (Ahammed et al., 2021). Aside from that, a prior study found that suicide and self-harm behaviors are public health concerns, in which university students are particularly vulnerable (Russell et al., 2019). According to previous study, suicidal ideation was also common among Bangladeshi university students during the onset of COVID-19 pandemic (Tasnim et al., 2020).

But, there is a relative lack of research on suicidal behavior and its associated factors among Bangladeshi university students, particularly in light of post one year of COVID-19 pandemic, which is extremely concerning for our nation. The reported study aimed to find out the factors associated with suicidal behavior to fill the critical literature gap as well as to inform the concerned authorities to take appropriate prevention strategies to address suicidal behaviors among university students in Bangladesh.

2. Methodology

2.1. Study design and participants

An online cross-sectional study was carried out among Bangladeshi university students residing in Dhaka, Chittagong, Barisal, Khulna, Mymensingh, Rajshahi, Rangpur, and Sylhet division from April 29 to May 15, 2021. Being a Bangladeshi university student, aged at least 18 years or older and having internet access as well as residing in Bangladesh during the study period were considered as inclusion criteria. The participants who didn't meet the criteria were excluded from the study.

2.2. Data collection procedure

Data were collected through convenience sampling technique via an online structured questionnaire through Google survey tool (Google Forms). The first page of the questionnaire comprised a brief introduction to the study's background, purpose, eligibility criteria, confidentiality, and anonymity as well as informed consent of each participant. After telling the significance of this study and taking electronic consent, the data were collected through social media like Facebook page, Facebook

messenger, WhatsApp etc. The study participants were asked, "Are you willing to participate in this study voluntarily?" with "Yes/No" response options. If the response was positive, they were given access to the full questionnaire. The questionnaire was filled up by the study respondents through self-administered process in native language. Throughout the study, ethical standards were maintained to the highest possible extent. The study was carried out in accordance with the Institutional Research Ethics and the Declaration of Helsinki or its comparable ethical standards. In addition, this study's protocol was approved by Sheikh Sayera Khatun Medical College, Gopalganj, Bangladesh (Ref No: SSKMC/EC/2021/476 (A)). Furthermore, all study respondents read the consent form and agreed to participate in the study. A total of 2401 data was collected from where 301 data were excluded due to incomplete responses, and finally 2100 data were considered for final analysis. Study respondents were not offered any incentives for taking part in this study. Data privacy and confidentiality were maintained properly at each stage.

2.3. Measures

In this study, a structured questionnaire along with an informed consent form, questions regarding socio-demographic information, COVID-19 related physical and psychosocial factors (CRPPF), preventive response to psychological stress, and Suicidal Behaviors Questionnaire-Revised (SBQ-R) scale were used to assess suicidal behavior-related factors among the study respondents.

2.3.1. Socio-demographic information

Socio-demographic variables comprised age, gender, educational background, family income, marital status, number of family members, and current location. Monthly family income was categorized into four classes: < 20,000 Bangladeshi Taka (BDT), 20,000–35,000 BDT, 35,001–50,000 BDT, and >50,000 BDT. Participants' location during the study were divided into two groups, those living in Dhaka division as "Inside Dhaka Division" and those living in other divisions as "Outside Dhaka Division".

2.3.2. COVID-19 related physical & psychosocial factors (CRPPF)

This portion addressed physical along with psychosocial aspects of the students such as financial crisis, social media bullying, distancing from friends/family, relationship problem (break up/family conflicts), feeling own self as a burden to family, being stressed of lockdown, limited access to health care facilities, the experience of COVID-19 symptoms, loss of family members or relatives due to COVID-19, and delayed graduation due to COVID-19 with "Yes," or "No" response options as well as the COVID-19 infection status was addressed as "Tested negative" "Tested positive" and "Did not test" response options.

2.3.3. Preventive response to psychological stress

The study further explored the activities students usually do to relieve their mental stress such as physical exercise, meditation, recreational activities (e.g., TV, movies, gaming etc.), talking to friends or family members, and do nothing with "Yes" or "No" response options.

2.3.4. Suicidal Behaviors Questionnaire-Revised (SBQ-R)

In this study, we used Suicidal Behaviors Questionnaire-Revised (SBQ-R) scale (Osman et al., 2001) that comprised a summarized self-report measure for assessing suicidal behaviors. The scale has been found to be reliable and valid in prior studies (Amini-Tehrani et al., 2019; Rueda-Jaimes et al., 2017). The SBQ-R consists of four items. The first item assesses the lifetime suicide ideation and suicide attempt. The second item assesses the frequency of suicidal ideation over the previous 12 months. The third item assesses the threat of suicidal attempt. Finally, the fourth item assesses the self-reported possibility of suicidal behaviors in the future. The total score of Suicidal Behaviors Questionnaire-Revised (SBQ-R) ranges between 3 to 18, in where a total score of ≥7 alludes

significant risk of suicidal behavior (Osman et al., 2001). In this study, the Cronbach's alpha for the SBQ-R items was 0.80.

2.4. Data analysis

The completed questionnaires were extracted from Google Forms and imported to Microsoft Excel 2016 for cleaning and coding. Data were analyzed using STATA version 14.1 (StataCorp LP, College Station, TX, USA). Descriptive statistics and logistic regression were conducted to find out the significant influencing factors for suicidal behavior. The outcome of regression analyses was presented by the odds ratio (OR) with a 95% confidence interval (CI), and the adjusted odds ratio (AOR) was also performed considering all the study variables. The association of variables was considered significant when the p-values were less than or equal to 0.05.

3. Results

The sample comprised 2100 survey responses, where the mean age of study respondents was 22.58 (SD ± 2.22). Approximately half of the students (50.81%) were aged between 22 to 24 years. Additionally, students aged 21 or less had considerably high suicidal risk (50.44%) compared to other age groups (Figure 1). The majority of the students were male (56%), from science background (52.05%), and unmarried (89.14%). The bivariate logistic regression showed that female students, and those living inside Dhaka division were at higher risk for suicidal behaviors. The adjusted multivariate logistic regression also revealed that students aged between (22–24) were at lesser risk for suicidal behaviors than students aged 21 or below (AOR = 0.78; 95% CI: 0.62 to 0.98) and most importantly, female students were at higher risk for suicidal behaviors than male students (AOR = 2.28; 95% CI: 1.86 to 2.81) along with students having family members more than seven were less likely to show suicidal behavior (AOR = 0.68; 95% CI: 0.47 to 0.99) (Table 1).

The study disclosed that a large proportion of the students (80.19%) reported that lockdown implemented to minimize COVID-19 transmission was very stressful to them and their graduation was delayed due to the outbreak (73.90%). Apart from these, students were also facing problems like financial crisis (59.48%), social media bullying (16.71%), relationship problems such as break-up or family conflicts (44.95%) etc. It was noticed that about 26% of the students experienced physical symptoms (e.g., fever, dry cough, breathing difficulty, fatigue etc.) similar to COVID-19. However, nearly half of the students (47.95%) did not get tested to know their COVID-19 infection status. It should also be noted that 8.05% of the students were tested positive for COVID-19 (Table 2).

Table 1. Association of socio-demographic information & suicidal behavior (N = 2100).

Variables	N (%)	OR (95% CI)	AOR (95% CI)
Age			
≤21	684 (32.57%)	Ref.	Ref.
22–24	1067 (50.81%)	0.84 (0.69–1.02)	0.78* (0.62–0.98)
≥25	349 (16.62%)	0.92 (0.71–1.19)	0.87 (0.64–1.19)
Gender			
Male	1176 (56%)	Ref.	Ref.
Female	924 (44%)	2.38** (1.99–2.84)	2.28** (1.86–2.81)
Educational background			
Science	1093 (52.05%)	Ref.	Ref.
Non-science	1007 (47.95%)	1.11 (0.93–1.32)	1.06 (0.87–1.29)
Marital status			
Unmarried	1872 (89.14%)	Ref.	Ref.
Married	191 (9.10%)	1.30 (0.96–1.75)	1.24 (0.88–1.76)
Widowed/Separated	37 (1.76%)	0.76 (0.39–1.47)	0.70 (0.33–1.46)
Family monthly income (in BDT)			
<20,000	693 (33%)	Ref.	Ref.
20,000–35,000	660 (31.43%)	1.04 (0.84–1.29)	1.07 (0.83–1.37)
35,001–50,000	366 (17.43%)	1.23 (0.95–1.59)	1.33 (0.98–1.82)
>50,000	381 (18.14%)	1.05 (0.82–1.35)	1.19 (0.86–1.65)
Number of family members			
<5	879 (41.86%)	Ref.	Ref.
5–7	1044 (49.71%)	1.00 (0.83–1.19)	0.90 (0.74–1.11)
>7	177 (8.43%)	0.82 (0.59–1.14)	0.68* (0.47–0.99)
Location (at the time of study)			
Outside Dhaka division	1194 (56.86%)	Ref.	Ref.
Inside Dhaka division	906 (43.14%)	1.23* (1.04–1.47)	1.03 (0.84–1.27)

*P-value ≤0.05; **P-value ≤0.01; OR = Odds Ratio; AOR = Adjusted Odds Ratio; CI: Confidence Interval.

The bivariate logistic regression found that financial crisis, social media bullying victimization, distancing from friends/family, relationship problem (break up/family conflicts), feeling own selves as a burden to families, being stressed of lockdown, limited access to health care facilities, the experience of COVID-19 symptoms, tested COVID-19 positive (infection status), loss of family members or relatives due to COVID-19 were some of the factors significantly associated with increased risk of suicidal behavior (Table 2).

Meanwhile, adjusted multivariate logistic regression further showed distancing from friends or family (AOR = 1.66; 95% CI: 1.34 to 2.04),
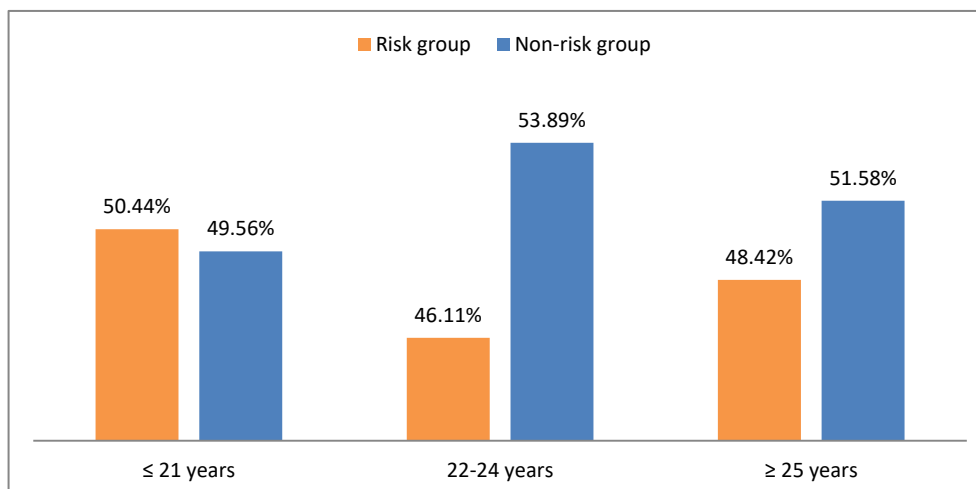

Figure 1. Participants' age-group distribution between risk and non-risk population.

Table 2. Association of COVID-19 related physical & psychosocial factors (CRPPF) & suicidal behavior (N = 2100).

Variables	N (%)	OR (95% CI)	AOR (95% CI)
Financial crisis			
Yes	1249 (59.48%)	1.44** (1.21–1.71)	0.99 (0.79–1.24)
No	851 (40.52%)	Ref.	Ref.
Victim of social media bullying			
Yes	351 (16.71%)	1.78** (1.41–2.25)	1.30 (1.00–1.71)
No	1749 (83.29%)	Ref.	Ref.
Distancing from friends/family			
Yes	813 (38.71%)	2.59** (2.17–3.11)	1.66** (1.34–2.04)
No	1287 (61.29%)	Ref.	Ref.
Relationship problem (e.g. Family conflicts/Break up)			
Yes	944 (44.95%)	3.36** (2.81–4.02)	2.20** (1.79–2.70)
No	1156 (55.05%)	Ref.	Ref.
Feeling own self as a burden to family			
Yes	880 (41.90%)	3.60** (3.00–4.32)	2.50** (2.02–3.11)
No	1220 (58.10%)	Ref.	Ref.
Being stressed of lockdown			
Yes	1684 (80.19%)	2.39** (1.90–3.00)	1.56** (1.19–2.03)
No	416 (19.81%)	Ref.	Ref.
Having limited access to health care facilities			
Yes	1460 (69.52%)	1.36** (1.12–1.63)	1.12 (0.90–1.40)
No	640 (30.48%)	Ref.	Ref.
Experienced physical symptoms similar to COVID-19			
Yes	552 (26.29%)	1.50** (1.24–1.83)	1.19 (0.94–1.52)
No	1548 (73.71%)	Ref.	Ref.
COVID-19 infection status			
Tested negative	924 (44%)	Ref.	Ref.
Tested positive	169 (8.05%)	1.78** (1.28–2.48)	1.39 (0.93–2.09)
Did not test	1007 (47.95%)	1.23* (1.03–1.47)	1.20 (0.97–1.48)
Experienced loss of family/relatives due to COVID-19			
Yes	436 (20.76%)	1.35** (1.10–1.67)	1.12 (0.87–1.43)
No	1664 (79.24%)	Ref.	Ref.
Delayed graduation due to COVID-19			
Yes	1552 (73.90%)	0.89 (0.73–1.08)	0.91 (0.71–1.15)
No	548 (26.10%)	Ref.	Ref.

*P-value ≤0.05; **P-value ≤0.01; OR = Odds Ratio; AOR = Adjusted Odds Ratio; CI: Confidence Interval.

Table 3. Association of preventive response to psychological stress & suicidal behavior (N = 2100).

Variables	N (%)	OR (95% CI)	AOR (95% CI)
Physical exercise			
Yes	266 (12.67%)	0.74* (0.57–0.96)	0.79 (0.58–1.07)
No	1834 (87.33%)	Ref.	Ref.
Meditation			
Yes	224 (10.67%)	0.86 (0.65–1.14)	0.92 (0.67–1.27)
No	1876 (89.33%)	Ref.	Ref.
Recreational activities			
Yes	1307 (62.24%)	0.73** (0.61–0.88)	0.95 (0.75–1.20)
No	793 (37.76%)	Ref.	Ref.
Talk to friends or family			
Yes	860 (40.95%)	0.67** (0.56–0.80)	1.00 (0.80–1.23)
No	1240 (59.05%)	Ref.	Ref.
Do nothing			
Yes	264 (12.57%)	2.62** (1.99–3.45)	1.90** (1.32–2.75)
No	1836 (87.43%)	Ref.	Ref.

*P-value ≤0.05; **P-value ≤0.01; OR = Odds Ratio; AOR = Adjusted Odds Ratio; CI: Confidence Interval.

4. Discussion

This study identified several factors associated with suicidal behavior among Bangladeshi university students after one year of the COVID-19 outbreak. Our study disclosed that approximately 47.90% of the students (Figure 2) were at risk of suicidal behavior, where a prior study among Greece university's students revealed that there was 63.3 percent increase in suicidal thoughts during the COVID-19 outbreak (Kaparounaki et al., 2020), which will stand out very alarming for the nations, if the rate increases consistently. Our study also found that students aged 22–24 years were at lesser risk for suicidal behaviors than students aged 21 or below. A previous study during the COVID-19 outbreak also found that students aged eighteen to twenty-four years had greater suicidal symptoms (Debowska et al., 2021) and this phenomenon might appear due to the variation in time and geographical location. It was seen that female students had higher risk of developing suicidal behavior than male students and this study finding is consistent with another previous study in where female had a greater incidence of suicidal risk than males (Rahman et al., 2021) which may be influenced by gender related vulnerability to psychopathology and psychosocial stressors (Vijayakumar, 2015). This study revealed that students who reside with large families had less risk of suicidal behavior which might appear because living with large family members have a chance to get the essential support, assisting in managing mental stress, and a previous study also found that large family was associated with a lower risk of suicide (Denney et al., 2009). The majority of the respondents (69.52%) shared that they experienced limited access to health care facilities which was also addressed as a significant factor for suicidal behavior during this outbreak which is similar with previous study finding (Raj et al., 2021). Previous studies in Bangladesh also found that people had barriers in terms of receiving healthcare services, especially telemedicine services during the COVID-19 pandemic (Rahman et al., 2020), and inadequate health facilities were the reason of suffering during the COVID-19 outbreak as well as dissatisfaction was also reported with the existing healthcare services (Pervez et al., 2021). Our study also disclosed that social media bullying was a contributing factor for increased suicidal risk and the previous study also identified that suicidal behavior was connected to bullying victimization (Holt et al., 2015). In our study, distancing from friends/family was marked as a significant factor for
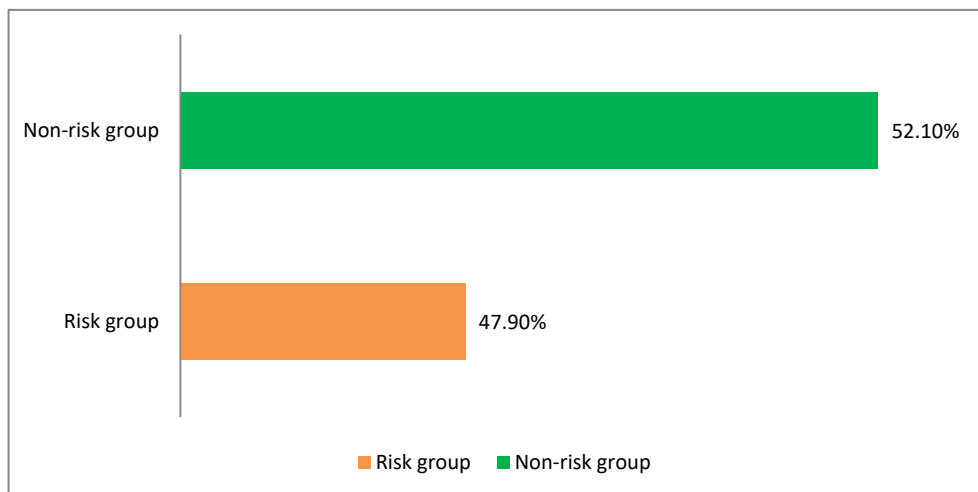
having relationship problems (e.g., break-up/family conflicts) (AOR = 2.20; 95% CI: 1.79 to 2.70), feeling own selves as a burden to their families (AOR = 2.50; 95% CI: 2.02 to 3.11), and being stressed of lockdown (AOR = 1.56; 95% CI: 1.19 to 2.03) were identified as some of the factors significantly associated with increased risk of suicidal behavior among the university students (Table 2).

Furthermore, students reported few activities which they do when they feel mentally stressed. The activities were recreational activities such as watching TV, movies etc. (62.24%), talking to friends or family (40.95%), physical exercise (12.67%) etc. It was seen in bivariate logistic regression that students involved in physical exercise, recreational activities and talking to friends or family for minimizing mental stress were at lesser risk of suicidal behaviors than students not involved in such activities. On the contrary, students who did not involve themselves in any kind of activities were at increased risk of suicidal behaviors. However, adjusted multivariate logistic regression further showed that students who did not partake in any sort of initiatives or activities to be reduced from mental stress were at increased risk of suicidal behaviors (AOR = 1.90; 95% CI: 1.32 to 2.75) (Table 3).

Figure 2. Risk vs. Non risk distribution of suicidal behavior among Bangladeshi university students.

inducing suicidal behavior which is consistent with the previous study which found that prevalence of suicidal ideation increased with the degree of loneliness (living alone or being without friends) (Stravynski and Boyer, 2001). People who are keeping themselves separated from family are likely to be faced less family support and prior study also found that lack of family support as predictors of suicidal risk (Chang et al., 2017). This study found that having a relationship problem such as family conflicts or break-up was responsible for higher rate of suicidal behavior. Previous study found that people who had suicide with mental illness was highlighted to be a significant factor was compounded by relationship problems (Judd et al., 2012). Students who felt themselves as burden to their families had a higher risk of suicidal behavior and prior study also disclosed that perceived burden may be a stronger determinant of suicidality (Bell et al., 2017). This study highlighted that being stressed of lockdown was significantly associated with increased risk of suicidal behavior among the students which is similar to a previous study finding (Priya et al., 2016). Our study also found that students involved in physical and recreational activities had less chance for suicidal behavior, and this finding is consistent with previous studies in where it was focused that being physically active as well as group activity reduced suicidal risk (Vancampfort et al., 2018; Oyama et al., 2005). Students involved in talking to friends or family were at lesser risk of suicidal behaviors because people who maintain family and social relationship by sharing or talking with friends/family members have a greater chance of getting support from family along with society. A prior study also revealed that family along with social support was inversely related to suicide history (Bell et al., 2017). In addition, family and society's members along with governmental and non-governmental organizations should have to come forward for giving them support and addressing their risk behavior for taking appropriate strategies in terms of suicidal prevention.

4.1. Limitations of the study

The present study has some limitations. Firstly, the self-reported data from the study is subjected to reporting bias, and this study was not able to consider respondents from lower socio-economic classes who do not have internet or Wi-Fi access. Secondly, the convenience sampling technique is limited by selection bias. Thirdly, there are some other risk factors might be related to the suicidal ideation or behavior, such as academic grades, depression symptoms or substance abuse that should be addressed. Finally, the cross-sectional design of the study limits the ability to explore causality. By considering mixed-method design with large-scale studies should be conducted for further exploring of these issues. Though the study has several limitations, we believe that the study provides important evidence on suicidal behavior of university students after one year of living with the COVID-19 pandemic.

5. Conclusion

The year-long influence of COVID-19 pandemic followed by series of lockdown attempts have created mental health burden especially among university students. The findings of this present study reported that distancing from friends or family, having relationship problems, feeling own selves as a burden to families, and being stressed of lockdown were identified as some of the factors significantly associated with increased risk of suicidal behavior among the university students. The concerned authorities e.g., researchers, governmental and non-governmental organizations should design & implement appropriate preventive strategies addressing suicidal behavior among university students to minimize the suicidal risk.

Declarations

Author contribution statement

Quazi Maksudur Rahman: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; analysis tools or data; Wrote the paper.

Abid Hasan Khan:Performed the experiments; Analyzed and interpreted the data; analysis tools or data; Wrote the paper.

Abdullah Al Zubayer:Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Masruk Ahmed:Analyzed and interpreted the data; Wrote the paper.

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Data availability statement

Data is available on reasonable request.

Declaration of interests statement

The authors declare no conflict of interest.

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