



## Journal of Experimental Biology and Agricultural Sciences

<http://www.jebas.org>

ISSN No. 2320 – 8694

### Factors Influencing Suicidal Behaviour among University Students: A Cross-Sectional Study from North India

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Received – January 13, 2023; Revision – February 07, 2023; Accepted – February 25, 2023

Available Online – February 28, 2023

DOI: [http://dx.doi.org/10.18006/2023.11\(1\).54.61](http://dx.doi.org/10.18006/2023.11(1).54.61)

#### KEYWORDS

Suicidal behaviour

Mental health

COVID-19

Logistic regression

#### ABSTRACT

In the majority of the affected nations, suicidal behavior against COVID-19 leads to various concerns. This study aimed to analyze determinants affecting suicidal behaviour among university students in Uttarakhand. An online cross-sectional survey of 18-year-old university students in Uttarakhand was conducted between April 2 and May 13, 2022. The questionnaire comprised socio-demographic information, the Suicidal Behaviors' Questionnaire-Revised (SBQ-R) scale, and elements related to the physical and psychological health of COVID-19 (CRPPF). The statistical study included demographic information, basic statistics in terms of frequency and percentage, and logistic regression. In comparison to students with fewer than seven family members, students with more than seven family members were less likely to participate in suicide behaviour (AOR = 2.21; 95% CI: 1.79 to 2.67) and vice versa (AOR = 0.81; 95% CI: 0.56 to 0.97). According to the study, a substantial majority of students (76.35%) claimed that the lockdown implemented to stop the spread of COVID-19 was extremely upsetting for them and that the pandemic had caused them to miss their graduation (73.90%). Adjusted multivariate logistic regression shows that feelings of a burden on family, (AOR= 1.98, 95% CI: 1.09 to 2.82), distancing from family or friends, (AOR=1.66; 95% CI: 1.26 to 2.01), having relationship dilemmas,

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Peer review under responsibility of Journal of Experimental Biology and Agricultural Sciences.

Production and Hosting by Horizon Publisher India [HPI]  
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(AOR= 2.31; 95% CI: 1.84 to 2.97), and being anxious during the lockdown, (AOR= 1.84; 95% CI: 1.08 to 2.27), are significant factors among participants that are linked to higher risk of engaging in suicidal behaviour. The possibility of university students engaging in suicide behaviour was significantly affected by numerous factors. In addition to defending the students' mental health, the concerned authorities should devise and implement strategies to safeguard the students' physical health.

## 1 Introduction

COVID-19 epidemic was declared a public health emergency of global concern by the World Health Organization on January 30, 2020 (Harpan et al. 2020). As of the 13th of May 2022, India had 4,26,17,810 confirmed COVID-19 cases, with approximately 5,24,636 deaths (MOFHW n.d.). According to new findings, the 2019 coronavirus disease pandemic (COVID-19) will have major psychological and social implications (Sher 2020). Suicidal behaviour is a serious mental health condition and there are significant risk factors related to gender, age, location, and socioeconomic position (Turecki and Brent 2016). Over 30% of the 5572 university students from 12 different nations who participated in the survey have thought about suicide, while 7% have attempted suicide (Eskin et al. 2016). It was discovered in earlier empirical research that approximately 18% of university students were suicidal (Britton et al. 2014). Suicidal behaviour among graduate students is marked by sorrow, pessimism, desperation, and a sense of powerlessness and additionally, suicide ideation and behaviours have been connected to bullying victimisation (Garcia-Williams et al. 2014; Holt et al. 2015). Among Chinese female students, sadness was found to be connected to suicidal behaviour (Tang et al. 2018). In a previous study among Chinese university students, it was found that the factors depression, anxiety, and stress to be the major risk factors for suicide (Lew et al. 2019). An earlier study in Greece indicated that university student suicidal intentions increased by 63.3 percent during the period of the COVID-19 pandemic (Kaparounaki et al. 2020). Also, university students in Poland during the COVID-19 outbreak were reported higher suicidal symptoms (Debowska et al. 2020). As part of the COVID-19 pandemic, suicidal behaviour is associated with fear of the disease, unstable economic conditions, an inability to access healthcare, mental illness, and social isolation (Raj et al. 2021).

Three Indian students, who were getting medical education in Wuhan, had returned to three different locations in Kerala on January 30, 2020, and discovered the first cases of COVID-19 in India (Narasimhan 2020). The second wave, which started in March 2021, was significantly worse than the first, with shortages of vaccines, hospital beds, oxygen tanks, and other medical supplies plaguing the majority of the nation's regions. By the end of April, 2021 India had the most recent and active cases worldwide. More than 400,000 new cases were added on April 30,

2021, setting new records (The Hindu 2021; BBC News 2021). The COVID-19 epidemic, which had substantial psychological repercussions and emphasized the occurrence of suicidal thinking and attempt had a particularly severe impact on Uttarakhand, a North Indian States. Studies on suicide behaviour and its causes among university students in Uttarakhand are few, especially in the aftermath of the COVID-19 outbreak, which is profoundly worrying for our nation. The proposed research objective was to identify the risk factors connected with suicidal behaviour in order to close a significant knowledge gap and to educate the proper authorities about suicidal behaviours among university students in Uttarakhand.

## 2 Materials and Methods

### 2.1 Study design, participants, and data collection

A cross-sectional online survey between the university students of Uttarakhand was carried out between April 2 and May 13, 2022. The authors started data collection from April 02 and received the required responses by May 13, 2022. Being an undergraduate student at a Uttarakhand university, being at least 18 years old, having access to internet, and residing in Uttarakhand for the duration of the study year were all taken into account as inclusion criteria. People who didn't match the qualifications couldn't take part in the study.

Data were gathered using the Google survey tool's online structured questionnaire and the convenience and snowball sampling techniques (Google Forms). The URL to the Google form was disseminated and shared over a number of social media platforms, including a Whatsapp group and the student's email addresses. After thoroughly explaining the survey's objectives, the questionnaire's format, and its confidentiality to each participant, their informed consent was obtained. All participants have been informed that their identity will be kept private and that the only use of the results would be for research. A total of 421 students filled the form, among these, 35 forms were incomplete, and therefore, 389 responses were considered for analysis. Responses were exported in MS Excel file and the same is exported in SPSS for statistical analysis.

### 2.2 Questionnaire and Measures

A self-designed questionnaire with four sections was made to collect data on the participants' demographics, COVID-19-related

physical and psychosocial factors (CRPPF), a precautionary mechanism to psychological strain, and the Suicidal Behaviours Questionnaire-Revised (SBQ-R) scale, which was utilised to analyse the factors linked to suicidal behaviour among the study participants. After the questionnaire had been developed and distributed to experts for their validation, a small pilot research was carried out to evaluate its usability and degree of difficulty. The results of the pilot study, however, were absent from the actual study samples.

Demographic information regarding the participants was given in the questionnaire's first section. Age, gender, education, household income, marital status, the number of children, and present location were sociodemographic traits.

The second half comprises physical alongside psychosocial aspects of the scholars like internet bullying, detachment from friends and family, relationship issues (breakup/family fights), experiencing like a load to family, stressed about getting of imprisonment, restricted accessibility to medical treatment facilities, the expertise of COVID-19 signs, loosing members of the family, friends or relatives because of COVID-19, and postponing in graduation because of COVID-19 with "Yes" or "No" response categories likewise because the COVID-19 disease status was addressed as "Tested negative", "Tested Positive" and "Did not test" response choices.

In the third section, there are questions about reducing students' mental stress that include doing nothing, chatting with friends or family, doing meditation, exercising, or engaging in leisure activities (such as watching TV or playing video games).

The final section employs the Suicidal Behaviours Questionnaire-Revised (SBQ-R) scale, a condensed self-report tool for evaluating suicidal behaviours (Osman et al. 2001). The scale has already been confirmed to be trustworthy and valid (Rueda-Jaimes et al. 2017; Amini-Tehrani et al. 2020). There are four items in the SBQ-R. The first question evaluates past attempts and ideas of suicide. The frequency of suicidal thoughts during the past 12 months is evaluated in the second question. The threat of a suicide attempt is evaluated in the third point. The fourth and last question evaluates the self-reported likelihood of engaging in suicidal behaviour in the future. The Suicide Behaviours Questionnaire-Revised (SBQ-R) has a total score range of three to eighteen, with a score of seven or lower indicating a significant risk of engaging in suicidal conduct (Osman et al. 2001). Cronbach's alpha coefficient was utilized to evaluate internal reliability, and it was found 0.83 showing that the collected data was sufficiently reliable.

### 2.3 Statistical analysis

BS Statistical package named SPSS was used to conduct the analysis. The information was summarised using frequency and

percentage. In order to compare various participant subgroups, logistic regression was performed. The odds ratio (OR) along with a 95% confidence interval (CI) was used to summarize the results of data analyses, and also the adjusted odds ratio (AOR) is calculated for each research variable. When the p-value of the test statistics was less than the used level of significance (5%), the statistical significance was taken into account.

### 3 Results

Frequency (N) and percentage (%) of all the demographic characteristics like gender, age, educational background etc. are represented in Table 1. Approximately half of the students (51.15%) were between the age range from 22-24 while 32.57% and 16.62% were aged below 22 and more than 24 respectively. According to bivariate logistic regression, female students who lived in Uttarakhand had a considerably increased chance of committing suicide. According to the adjusted multivariate logistic regression (AOR), students between the ages of 22-24 had a lower probability of engaging in suicide behaviours than students aged 21 and below (AOR= 0.80; 95% CI: 0.61 to 0.98); and those between those ages (AOR= 0.87; 95% CI: 0.62 to 0.97). Additionally, students with families that included more than seven people showed lower suicidal behaviour (AOR =0.81; 95% CI: 0.56 to 0.97) than students with fewer than seven family members (AOR =2.21; 95% CI: 1.79 to 2.67) and female students demonstrated higher rates of suicidal behaviour than male students (Table 1).

The results of the correlation of COVID-19 associated physical and physiological factors (CRPPF) with suicidal behaviour are presented in Table 2. The problem of the financial crisis was high (61.18%) among the students and they were in stress (76.35%) during the lockdown. Also, students were facing problems of social media (internet) bullying (17.74%), relationship related problems/issues like break-up, or family conflicts (46.03%), etc. Approximately one-fourth of the students experienced the loss of family/relatives because of COVID-19 epidemic. It has been observed that 9.77% of students tested positive for COVID-19 although 44.73% of students did not test positive against COVID-19.

The survey showed a significant part of the participants (80.19%) said that the lockdown adopted to reduce COVID-19 transmission was extremely distressing for them and that the epidemic had delayed their graduation (73.90%). Students were also dealing with issues like financial difficulties (59.48%), cyberbullying (16.71%), interpersonal issues including breakups or family conflicts (44.95%), etc. Over 26% of the students reported physical symptoms quite similar to COVID-19, such as fever, dry cough, breathing problems, exhaustion, etc. However, almost half of the students (47.95%) did not have their COVID-

Table 1 Summary of association of socio-demographic information with suicidal behaviour

Variables	Category	N (%)	OR (95% CI)	AOR (95% CI)
Age	≤21	134 (34.44%)	RC <sup>a</sup>	RC <sup>a</sup>
	22–24	199 (51.15%)	0.86(0.69–1.03)	0.80* (0.61–0.98)
	≥25	56 (14.39%)	0.91(0.70–1.12)	0.87* (0.62–0.97)
Gender	Male	229(58.86%)	RC <sup>a</sup>	RC <sup>a</sup>
	Female	160 (41.14%)	2.26** (2.01–2.74)	2.21** (1.79–2.67)
Educational background	Science & Technology	85 (21.85%)	RC <sup>a</sup>	RC <sup>a</sup>
	Art	128 (32.90%)	0.99 (0.67–1.27)	0.94 (0.71–1.21)
	Commerce	105 (26.99%)	0.82 (0.61–1.19)	0.79 (0.63–1.09)
	Others	71 (18.25%)	0.84 (0.64–1.14)	0.78 (0.61–0.99)
Marital status	Unmarried	356 (91.51%)	RC <sup>a</sup>	RC <sup>a</sup>
	Married	191 (9.10%)	1.27 (0.98–1.71)	1.19 (0.84–1.69)
	Others	9 (0.02%)	0.77 (0.44–1.39)	0.68 (0.39–1.34)
Family monthly income	<18, 497	31 (7.96%)	1.11 (0.81–1.21)	1.17 (0.80–1.59)
	18498–30830	64 (16.45%)	1.27 (0.94–1.64)	1.21 (0.91–1.60)
	30831–44128	136 (34.96%)	1.15 (0.87–1.57)	1.21 (1.01–1.48)
	More than 44129	158 (40.61%)	1.17 (0.88–1.44)	1.13 (0.98–1.47)
Number of family members	<4	171 (43.95%)	RC <sup>a</sup>	RC <sup>a</sup>
	4–7	201 (51.67%)	0.99 (0.81–1.14)	0.94 (0.74–1.12)
	>7	17 (4.37%)	0.84 (0.57–1.17)	0.81* (0.56–0.97)
Location (at the time of study)	Inside Uttarakhand	269 (69.15%)	RC <sup>a</sup>	RC <sup>a</sup>
	Outside Uttarakhand	120 (30.84%)	1.23* (1.04–1.47)	1.03 (0.84–1.27)

<sup>a</sup>RC: Reference Category

19 contamination state checked. Additionally, it should be mentioned that 8.05% of the pupils screened positive against COVID-19 (Table 2).

The financial crisis, disconnection from friends and family, relationship issues (family strife, breakup, etc.), burden on family, feeling stressed during COVID-19, social media bullying victimization, Lack of health care facilities, experiencing COVID-19 symptoms, and being COVID-19 positive (infection status) were some of the factors strongly linked with an elevated risk of suicidal behaviour (Table 2).

Additionally, adjusted multivariate logistic regression shows that stress during lockdown (AOR= 1.84; 95% CI: 1.08 to 2.27), feeling like a burden to family (AOR= 1.98; 95% CI: 1.09 to 2.82), turning away from friends or family (AOR =1.66; 95% CI: 1.26 to 2.01), having issues with relationships (AOR= 2.31; 95% CI: 1.84

to 2.97) are all significant factors substantially associated with an increased risk of suicidal behaviour (Table 2).

Table 3 shows that a high percentage of the students were not doing physical exercise (87.33%) and meditation (89.33) during COVID-19 however, the majority of students (62.24%) reported that they have done recreational activities during the lockdown. Additionally, bi-variate logistic regression revealed that undergraduates who engaged in activities like a workout, leisure, and talking to family or friends to relieve stress were less likely to engage in suicidal conduct than those who did not. The risk of suicide behaviors was actually higher among students who did not participate in any activities. However, adjusted multi-variate logistic regression also showed that students without any mental stress-relieving activities or events were more likely to commit suicide (AOR=1.79; 95% CI: 1.12 to 2.76) (Table 3).

Table 2 Summary of association of COVID-19 related physical &amp; psychosocial factors (CRPPF) with suicidal behaviour

Variables	Category	N (%)	OR (95% CI)	AOR (95% CI)
Financial crisis	Yes	238 (61.18%)	1.37** (1.19-1.67)	1.03 (0.76-1.21)
	No	151 (38.82%)	RC <sup>a</sup>	RC <sup>a</sup>
Victim of social media bullying	Yes	69 (17.74%)	1.64** (1.37-2.07)	1.27 (1.01-1.69)
	No	320 (82.26%)	RC <sup>a</sup>	RC <sup>a</sup>
Distancing from friends/family	Yes	147 (37.79%)	2.41** (2.09-3.01)	1.66** (1.26-2.01)
	No	242 (62.21%)	RC <sup>a</sup>	RC <sup>a</sup>
Relationship problems (e.g. Family conflicts/Break up)	Yes	179 (46.02%)	3.37** (2.98-4.01)	2.31** (1.84-2.97)
	No	210 (53.98%)	RC <sup>a</sup>	RC <sup>a</sup>
Feeling own self as a burden to family	Yes	161 (41.39%)	2.84** (2.09-3.41)	1.98** (1.09-2.82)
	No	228 (58.61%)	RC <sup>a</sup>	RC <sup>a</sup>
Being stressed of the lockdown	Yes	297 (76.35%)	2.59** (1.87-3.11)	1.84** (1.08-2.27)
	No	92 (23.65%)	RC <sup>a</sup>	RC <sup>a</sup>
Having limited access to healthcare facilities	Yes	201 (51.67%)	1.19* (1.04-1.41)	1.04 (0.86-1.18)
	No	188 (48.33%)	RC <sup>a</sup>	RC <sup>a</sup>
Experienced physical symptoms similar to COVID-19	Yes	291 (74.81%)	1.67** (1.14-1.98)	1.37** (1.05-1.72)
	No	1548 (25.19%)	RC <sup>a</sup>	RC <sup>a</sup>
COVID-19 infection status	Tested negative	174 (44.73%)	1.86** (1.39-2.17)	1.43** (1.21-1.66)
	Tested positive	38 (9.77%)	1.21* (1.04-1.38)	1.09 (0.91-1.28)
	Did not test	177 (45.50%)	RC <sup>a</sup>	RC <sup>a</sup>
Experienced loss of family/relatives due to COVID-19	Yes	98 (25.19%)	1.36** (1.14-1.61)	1.01 (0.78-1.18)
	No	291 (74.81%)	RC <sup>a</sup>	RC <sup>a</sup>
Delayed graduation due to COVID-19	Yes	91 (23.39%)	0.77 (0.61-1.93)	0.69 (0.59-0.79)
	No	298 (76.61%)	RC <sup>a</sup>	RC <sup>a</sup>

<sup>a</sup>RC: Reference Category

Table 3 Summary of association of preventive response to psychological stress with suicidal behaviour

Variables	Category	N (%)	OR (95% CI)	AOR (95% CI)
Physical exercise	Yes	82 (21.07%)	0.69* (0.52-0.91)	0.72 (0.64-1.12)
	No	307 (78.92%)	RC <sup>a</sup>	RC <sup>a</sup>
Meditation	Yes	54 (13.88%)	0.81 (0.64-1.11)	0.89 (0.69-1.31)
	No	335 (86.11%)	RC <sup>a</sup>	RC <sup>a</sup>
Recreational activities	Yes	256 (65.80%)	0.66** (0.59-0.79)	0.89 (0.72-1.16)
	No	133 (34.19%)	RC <sup>a</sup>	RC <sup>a</sup>
Talk to friends or family	Yes	174 (44.73%)	0.66** (0.51-0.82)	0.99 (0.82-1.21)
	No	215 (55.26%)	RC <sup>a</sup>	RC <sup>a</sup>
Do nothing	Yes	81 (20.82%)	2.44** (1.89-3.37)	1.79** (1.12-2.56)
	No	308 (79.17%)	RC <sup>a</sup>	RC <sup>a</sup>

<sup>a</sup>RC: Reference Category

#### 4 Discussion

The present research looked into a number of variables that affect university students' suicide behaviour in Uttarakhand. The study found that students between the ages of 22-24 had a lower risk of acting suicidal than students aged 21 or below and students aged 25 and above. In a recent study, similar tendency was observed among Bangladeshi university students (Rahman et al. 2022). This study found a higher incidence of suicidal behaviour among female students than male students (Rahman et al. 2022; Rahman et al. 2021). It was determined that when compared to male pupils, female students exhibit suicidal behaviour more frequently. The gender differences in vulnerability to psychopathology and psychosocial pressures may have an impact on the study's findings (Vijakumar 2015).

The present study found that students who live in big families had a lower chance of suicidal behaviour. This may be due to the opportunity to receive the necessary support that comes with having a large family, which helps with coping with mental stress. Another study also found that having a big family was linked to a lower chance of suicide (Rahman et al. 2022). Limited access to medical services was mentioned as a significant contributing reason for suicide behaviour during this outbreak by the majority of respondents (69.52%), which is consistent with findings from earlier studies (Raj et al. 2021). According to additional research, the COVID-19 outbreak was brought on by a lack of healthcare facilities, and people also complained about the quality of the current medical services (Pervez et al. 2021; Rahman et al. 2020). In addition, our study found that bullying on social media increased the likelihood of suicidal conduct, and a prior study found a link between bullying victimization and suicidal behaviour (Garcia-Williams et al. 2014). In earlier studies, it was discovered that being cut off from family, friends or relatives was a significant risk factor for developing suicidal behaviour. It was also discovered that the prevalence of suicide thinking increased with the level of isolation (either living alone or having no friends) (Stravynski and Boyer 2001). People who maintain their distance from their families are more likely to experience absence of parental support, which has also been associated to a greater risk of suicidal thoughts in previous research (Chang et al. 2017). According to this study, a higher rate of suicide conduct was caused by relationships that were problematic, such as family disputes or breakups.

According to a prior study, individuals with mental conditions who committed suicide typically experienced interpersonal difficulties (Judd et al. 2012). A previous study found that students who sensed a load to their families were more likely to act suicidally (Bell et al. 2018; Klonoff-Cohen 2022). The perceived burden may be a more substantial predictor of suicidality. The results of this

study indicate a strong association between lockdown anxiety and a student body that is more inclined to act suicidally (Priya et al. 2016; Yu 2022). Additionally, our study found that adolescents who engaged in sports and extracurricular activities had a decreased probability of committing suicide. This result is in line with past studies that were more focused on the notion that social interaction and physical activity reduce the risk of suicidal behaviour (Vancampfort et al. 2018; Oyama et al. 2005). Students who engaged in conversation with friends or family members had a lower risk of engaging in suicide behaviour because they were more likely to receive social and familial support while chatting or sharing with friends and family. In a previous study, it was also discovered that social and familial support were inversely connected to a history of suicide (Klonoff-Cohen 2022; Martinez et al. 2022). Additionally, family, friends, members of society, and governmental and private organizations should step up to help them and address their risky behaviour to adopt effective suicidal prevention techniques.

#### Conclusion and Limitations of the study

The COVID-19 pandemic's one-year impact and the consequent lockdown operations have had an adverse impression on people's mental health, specifically the university students in north India. One of the characteristics strongly linked with a greater risk of suicidal behaviour among participants, according to the study's findings, is being separated from family and friends. Other characteristics includes having issues related to relationship, feeling like a burden to one's family, and going through periods of acute stress. The appropriate authorities, including researchers, and governmental and private organizations, must create and implement efficient preventative policies treating suicidal behaviour among university students in order to minimize the risk of suicide.

There are certain shortcomings in the current empirical research. The data collected from the survey using the online data collection tool may lead to bias, and this survey was unable to account for participants from junior socioeconomic categories that do not have access to connectivity in terms of Wi-Fi and others. Second, due to the non-availability of the sampling frame of the survey participant, the simple random sampling technique is constrained by selection bias. Third, as they may be linked to suicidal thoughts or conduct, other risk factors including subpar academic performance, depression signs, or substance abuse required to be countered. Finally, investigating causality is challenging due to the study's cross-sectional nature. Large-scale research using a mixed-method approach should be conducted to better examine these difficulties. Despite a number of limitations, we think the study offers significant information on university students' suicide behavior after a year of dealing with the pandemic.

### Acknowledgment

The authors thank the respondents who take part in the survey to complete the research.

### Conflict of Interest

None

### Source of Funding

None

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