

Original Research



Suicidal behaviors among undergraduate medical students in Bangladesh

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Abstract

Background: Suicide among medical students is a global public health concern; however, it is often addressed poorly in developing countries like Bangladesh. This study aims to examine suicidal behaviors among undergraduate medical students in Bangladesh.

Methods: This cross-sectional analytical study was conducted between February and July of 2019. Data were collected from 583 MBBS students at Bangladesh's public and private medical colleges. A convenience sampling method was used, and data were collected through a pre-tested semi-constructed questionnaire.

Results: A lifetime suicidal ideation was found among 23.8% of the participants. Significant associations were found among lifetime suicidal ideation, plan and attempt with depression, comorbidity, and family history. Multivariable logistic regression models revealed that a family history of suicide attempts or death by suicide increased the odds six-fold for ideation, over sixfold for a plan, and threefold for an attempt. Females were twice likely to be susceptible to suicide ideation, plan, and attempt.

Conclusion: Suicidality appears high among medical students in Bangladesh. Levels of depression, comorbidities, as well as substance abuse affect lifetime suicide ideation. A previous history of attempting or committing suicide in the respondent's family increases the individual risk for ideation, plan, and attempt. Females are more vulnerable than males.

Introduction

Suicide has become a major public health concern worldwide. Each year suicide is accountable for almost one million deaths across the globe.¹ Developing countries like Bangladesh lack data on suicide, especially its prevalence and risk factors, as well as information on suicidal behaviors such as suicide plans and attempts by young people. Previous research has shown that, on average, 9% of the population has had suicidal thoughts at some point in their life.^{2,3} However, clinicians, researchers, and other stakeholders still fail to address the importance of identifying risk factors that cause young people to commit suicide.³ Research has also shown that suicide is an outcome of several factors, including genetic, psychological, socio-economic, and cultural.⁴ Recent reports also found that a history of previous suicidal attempts plays a vital role

in future suicide attempts and committing suicide.⁵ Hence, due to an absence of specific regional data and the ability to address the phenomenon deeply, medical educators remain uncertain about endemicity, trends, and predictors of suicide among medical students and, thus, how to intervene effectively.⁶ The alarming trends of suicidality among medical students are increasing day by day worldwide. What we see at the moment is just the tip of the iceberg. The reasons behind the alarming rate of suicides among medical students each year are unclear, and it is also equivocal for us how medical education and training may cause burnout, and whether the education system or other factors cause them to commit suicide.⁷ In Canada, an annual estimate showed that between 0.0059% to 0.0087% of medical students commit suicide,⁸ which might be a negligible amount to some.

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However, unfortunately, only 44% of medical schools have a database of their own to record deaths of students, including suicides, and only 63% address the problem and have policies to respond.⁸ Most recently, a web-based survey conducted in Brazil on suicidality revealed several associated factors along with the medical curriculum, which also determined a prevalence of suicide attempts in 8.9% of the study group (in a total of 4840 participants).⁹ Medical education is mainly perceived as time-consuming and stressful.^{10,11} Those could be due to the stressors in day-to-day life, excessive academic burden, competitive environment, fear of failure in examinations and future career, and other psychosocial disturbances.¹⁰⁻¹² Several reports have suggested that medical students demonstrate anxiety, stress, and depression from the beginning of the program.¹³ Medical student suicide is an area that demands more research in Bangladesh, as it is a low-resource country, and building a prominent medical professional community impacts public finance and administration. Moreover, it is not only accomplished by reporting several deaths by suicide; but also, it is necessary to dig deeper to find the links by examining demographics, public vs. private medical college, financial cost, family problems, mental health (including mental disorders such as anxiety or depression), relationship disturbances, academic performance, and burnout.^{9,14}

Bangladesh lacks national suicide surveillance and database; hence, no data are available concerning the rate of suicides, suicidal ideation, plans, and attempts.^{15,16} In recent times, medical educators and civil society have actively addressed the growing mental health burden affecting undergraduate medical students in the country as well as random news concerning medical students' suicide in print or on social media.^{17,18} It is crucial to obtain reliable estimates of suicidal ideation and other possible causes of suicide to make efforts to prevent and treat vulnerable medical students.⁷ There is a dearth of research on suicidal behaviors among medical students in the country. Therefore, the objectives of this study were to probe suicidal ideation among MBBS students, determine the percentage of students having suicidal plans, preparation, and attempts, and finally, discern the relationship between suicidal ideation and different socio-demographic variables. It is expected that this study will help develop awareness, develop a pool for data mining, and identify suicide prevention strategies by the stakeholders.

Materials and Methods

This cross-sectional analytical study was conducted between February and July of 2019. Participants included MBBS students from different public and private medical colleges in Bangladesh. Participants were selected by stratified random sampling from the capital city Dhaka and district towns in Bangladesh. Data were collected using a self-administered, semi-constructed questionnaire

with 42 items in various domains to probe suicidality. The first part collected information on the participants' socio-demographic characteristics. The next part collected information on various aspects of personal information, such as the personal history of mental illness, suicidal thoughts, attempts, other systemic diseases, substance abuse, family history of suicidality, personal relationships with teachers, parents, and peers, intimate/love affair, academic performance, etc. The items in this section were all dichotomous. In the third part, the PHQ-9 screening was used to evaluate depression.¹⁹ Prior to this large-scale research, a small group of students participated in a pilot study. A team of trained data enumerators collected data for this study. Approved by respectable authorities, each medical college's library or classroom served as the location for data collection. A written informed consent was obtained during the data collection process; in addition, confidentiality and anonymity were strictly maintained. A total of 844 responses were received from participants who were studying MBBS. A subset of the variables from the questionnaire was used for the final analysis. Missing values and incomplete responses were deleted list-wise. Thus the final analysis was carried out on 583 responses. Data were entered into an electronic data capture system (REDCap) with built-in functionality for maintaining data quality, privacy, and confidentiality. Datasets were cleaned of identifying information before analysis. Maintaining data accuracy and completeness was of utmost importance to us. Data were analyzed using R software for statistical programming and graphics.

Results

The mean age of the participants was 21.4 ± 1.7 . In all, 57.5% of the respondents were females, the majority (32.9%) were fifth-year students, most (92.5%) were unmarried, and 67.7% were from urban areas (Table 1). Overall, 6.7% of participants had a familial history of mental illness, 7.1% reported familial incidence or attempts of suicide, 9.6% were suffering physical co-morbidities, and 6.4% were smokers (Table 2). Table 3 shows 3.6% of students had suicidal thoughts in the previous 48 hours of the response, 9.1% reported such ideation or thoughts in the past month, 16.9% had the same suicidal thoughts in the year prior to this study, while 23.8% reported suicidal thoughts at some point in their lives. About one in ten (9.8%) expressed their idea, whereas 8.7% made plans (Table 3).

A bivariate analysis was performed on the lifetime suicidality of the participants, which revealed a significant association between lifetime suicidal thoughts, plan or attempt with depression, comorbidities, smoking/substance use, mental or psychological conditions, and family history of attempt or death by suicide (Table 4). Multivariable logistic regression showed that a family history of suicide attempt or death by suicide increased the odds by sixfold for ideation, over sixfold for a plan, and threefold for an attempt. Females were twice likely

Table 1. Demographic characteristics of the respondents

Variables	Levels	No. (%)
Age (y)	Mean (SD)	21.4 (1.7)
Gender	Male	239 (42.5)
	Female	324 (57.5)
Marital status	Currently married	20 (3.6)
	Never married	521 (92.5)
	Other	22 (3.9)
	1st	53 (9.4)
Academic year	2nd	110 (19.5)
	3rd	137 (24.3)
	4th	78 (13.9)
Residence	5th	185 (32.9)
	Rural	182 (32.3)
	Urban	381 (67.7)
Religion	Buddhism	2 (0.4)
	Hinduism	56 (9.9)
Family type	Islam	505 (89.7)
	Joint family	77 (13.7)
	Nuclear family	486 (86.3)

Table 2. Personal characteristics of the respondents

Variable	Levels	No. (%)
Suffered psych condition anytime in life	Yes	73 (13.0)
Anyone in a family with mental illness	Yes	38 (6.7)
Family member attempted or passed away by suicide	Yes	40 (7.1)
Physical comorbidity	Yes	54 (9.6)
Smoking or substance use	Yes	36 (6.4)
Do parents have high expectations?	Yes	395 (70.2)
Satisfied with academic performance	Yes	268 (47.6)
Satisfied with teachers	Yes	325 (57.7)
Dissatisfied with love affairs	Yes	117 (20.8)

Table 3. Descriptive summary of personal and family history

Variable	Levels	No. (%)
Have you thought about committing suicide in the past 48 hours?	Yes	20 (3.6)
Have you thought about committing suicide in the past month?	Yes	51 (9.1)
Have you thought about committing suicide in the past year?	Yes	95 (16.9)
Lifetime suicide ideation	Yes	134 (23.8)
Have you ever told someone that you were going to commit suicide?	Yes	55 (9.8)
Have you made a suicidal plan?	Yes	49 (8.7)
Do you have any preparation for suicide?	Yes	11 (2.0)
Have you previously attempted suicide?	Yes	31 (5.5)

to be susceptible to suicide ideation, plan, and attempt. Physical comorbidity was 2.5 times more likely to increase the odds for ideation but was not a significant predictor for plan or attempt. Smoking or substance use increased

the odds of ideation by twofold and the odds of an attempt by more than threefold but was not a significant predictor of a suicide plan. Mental or psychological conditions increased the odds by over twofold for ideation but not significantly for plan or attempt (Table 5).

Discussion

Research on suicide among different health professions is a new trend in public health, psychiatry and psychology, occupational health, and medical sociology.²⁰ Medical education is mainly perceived as time-consuming, demanding, and stressful.^{10,11} This could be due to stressors in day-to-day life and excessive academic burden, little or no relaxation time, frequent examinations, competitive environment, and other aggravating factors such as inability to cope with new teaching and learning methods, political unrest, and unsatisfactory administration/management in colleges that hamper peaceful study, monetary burden, fear of failure, and psychosocial problems.^{10,11} Evidence suggests that medical students are prone to depression. The rates of depression and its consequences have been found to be significantly higher than the general population of a similar age group.^{7,13} Hence, we assume that suicidal ideation could be higher in this group. Cheng and colleagues recently found a similar notion while investigating the deaths of medical students between 2006 and 2011 in 92 (out of 133) U.S. medical schools.²¹ Another research found that 27.2% of medical students (n=122,356) reported depressive symptoms, higher than the general population or any other group. Around 11% of those participants reported suicide ideation.⁷ Another study from Canada revealed that most suicidal deaths of students happened in “senior years of study or prior to residency” (similar to the internship training in Bangladesh), irrespective of gender. Psychological stress and subsequent burnout have recently been a focal point as essential indicators of “distress in medical students” which ultimately helps screen suicidality or suicidal ideation in a cohort.^{20,22} In another way, evidence showed that “recovery from burnout” helps decrease the incidence of suicidal ideation.²² It revealed two independent predictors of suicidal ideation – “burnout syndrome” and “low mental quality of life” among students. A study conducted in Oman using PHQ-9 found that medical students commonly suffer from “burnout syndrome”, characterized by “high emotional exhaustion, high cynicism, low professional efficacy,” and subsequent depression, especially in their pre-clinical phases.²³ In our study, we acknowledge and understand that some factors, such as privacy concerns, cultural norms, religious beliefs, family preferences, and social stigma related to suicide in our country, may have led to underreporting of personal or familial history, incidence or event, as evident in other studies.^{8,11} The current study revealed essential and previously unavailable information regarding suicidal behaviors among undergraduate medical students in

Table 4. Bivariate analysis of socio-demographic and behavioral risk factors for lifetime suicidal ideation, plan, and attempt (n=583)

Label	Levels	Lifetime Ideation			Plan			Attempt		
		No	Yes	P value	No	Yes	P value	No	Yes	P value
Depression Category	Minimal or none	170 (38.2)	21 (15.2)	<0.001	183 (34.4)	8 (15.7)	<0.001	185 (33.6)	6 (18.8)	<0.001
	Mild	159 (35.7)	32 (23.2)		179 (33.6)	12 (23.5)		186 (33.8)	5 (15.6)	
	Moderate	70 (15.7)	40 (29.0)		97 (18.2)	13 (25.5)		103 (18.7)	7 (21.9)	
	Moderately severe	46 (10.3)	45 (32.6)		73 (13.7)	18 (35.3)		77 (14.0)	14 (43.8)	
Gender	Male	199 (44.7)	46 (33.3)	0.018	229 (43.0)	16 (31.4)	0.137	235 (42.6)	10 (31.2)	0.269
	Female	246 (55.3)	92 (66.7)		303 (57.0)	35 (68.6)		316 (57.4)	22 (68.8)	
Comorbidity	No	415 (93.3)	113 (81.9)	<0.001	486 (91.4)	42 (82.4)	0.045	503 (91.3)	25 (78.1)	0.023
	Yes	30 (6.7)	25 (18.1)		46 (8.6)	9 (17.6)		48 (8.7)	7 (21.9)	
Smoking/substance use	No	429 (96.4)	117 (84.8)	<0.001	504 (94.7)	42 (82.4)	0.003	522 (94.7)	24 (75.0)	<0.001
	Yes	16 (3.6)	21 (15.2)		28 (5.3)	9 (17.6)		29 (5.3)	8 (25.0)	
Mental or psychological conditions	No	399 (89.7)	86 (62.3)	<0.001	456 (85.7)	29 (56.9)	<0.001	468 (84.9)	17 (53.1)	<0.001
	Yes	46 (10.3)	52 (37.7)		76 (14.3)	22 (43.1)		83 (15.1)	15 (46.9)	
Parents' high expectations	No	140 (31.5)	33 (23.9)	0.109	157 (29.5)	16 (31.4)	0.751	164 (29.8)	9 (28.1)	1.000
	Yes	305 (68.5)	105 (76.1)		375 (70.5)	35 (68.6)		387 (70.2)	23 (71.9)	
Satisfied with academic performance	Yes	224 (50.3)	53 (38.4)	0.015	253 (47.6)	24 (47.1)	1.000	263 (47.7)	14 (43.8)	0.718
	No	221 (49.7)	85 (61.6)		279 (52.4)	27 (52.9)		288 (52.3)	18 (56.2)	
Satisfied with teachers	Yes	275 (61.8)	63 (45.7)	0.001	318 (59.8)	20 (39.2)	0.007	323 (58.6)	15 (46.9)	0.202
	No	170 (38.2)	75 (54.3)		214 (40.2)	31 (60.8)		228 (41.4)	17 (53.1)	
Unhappy with love affairs	No	386 (86.7)	77 (55.8)	<0.001	437 (82.1)	26 (51.0)	<0.001	446 (80.9)	17 (53.1)	0.001
	Yes	59 (13.3)	61 (44.2)		95 (17.9)	25 (49.0)		105 (19.1)	15 (46.9)	
Family history of attempt or death by suicide	No	431 (96.9)	110 (79.7)	<0.001	505 (94.9)	36 (70.6)	<0.001	516 (93.6)	25 (78.1)	0.005
	Yes	14 (3.1)	28 (20.3)		27 (5.1)	15 (29.4)		35 (6.4)	7 (21.9)	

P values for categorical variables with two levels are based on Fisher's exact test. Otherwise, the P values are from Pearson's chi-square test. P values for the difference between the two mean ages are based on independent sample t tests.

Bangladesh. About 24% of the participants (one in four) had suicidal thoughts at some point in their life. Other studies conducted in various countries showed a range in suicidal ideation from 4.9% to 35.6%.^{7,24,25} In the western part of Nepal, a similar study found that 10.7% of medical students had suicidal ideation, and 18.4% had lifetime suicidal ideation.²⁶ Levels of depression, comorbidities, and substance abuse are associated with lifetime suicide ideation. Familial incidence of suicidal attempts or deaths was also found to be associated with the respondent's own ideation, plan, or attempt of suicide. Female students were found to be more prone to suicidality than males. Arafat supports this finding.¹⁵ Globally, in the 15-29 age group, suicide is among the most common and leading causes of death²⁷; our participants' mean age falls within that age group. A retrospective study showed that initiation of suicidal ideation at an early age was common: 34% of the study participants made a suicide plan at an early age – among them, 72% came up with a suicide plan that led them to suicidal attempts; however, 28% of attempts were sudden and unplanned.²⁸ The study also confirmed that the first attempt is usually made within one year of onset of suicidal ideation in 60% of cases.²⁸ Although it is assumed that “prior suicidal behavior” is one of the strongest “predictors to screen suicidality” or “correlational factors

to suicide-related deaths”, an incidence of suicidal death without prior planning or attempts is not uncommon.² However, some other studies also showed an increased incidence of suicidal behavior in persons having prior suicidal attempts and/or who have experienced suicidality in families,^{13,29} which is similar to our findings.

This study aimed to identify predictors of suicidal ideation in medical students. Despite the limited availability of previous data probing students' distress, academic performance, the incidence of dropout, family and relationship issues, and correlation of those factors to suicidal behaviors, we endeavored to provide evidence supporting our findings. A recent editorial discussed institutional resistance or social stigma as a barrier to openly discussing suicide by medical students.³⁰ We encountered similar difficulties while obtaining permission from the authorities of the medical colleges and even during the study. Interviewing about suicidality is still viewed as taboo in conservative societies such as Bangladesh. Our study has some limitations: its small sample size was due to budget constraints, and a cross-sectional study design lacks an assessment of the outcomes.

Conclusion

Table 5. Multivariable analysis of socio-demographic and behavioral risk factors for lifetime suicidal ideation, plan, and attempt (n=583)

		Lifetime Ideation	Plan	Attempt
		OR (multivariable)	OR (multivariable)	OR (multivariable)
Gender	Male	-	-	-
	Female	2.11 (1.26 to 3.63, <i>P</i> =0.005)	1.99 (0.96 to 4.40, <i>P</i> =0.075)	2.28 (0.93 to 6.14, <i>P</i> =0.083)
Comorbidity	No	-	-	-
	Yes	2.41 (1.16 to 4.96, <i>P</i> =0.017)	1.41 (0.52 to 3.53, <i>P</i> =0.477)	1.74 (0.57 to 4.78, <i>P</i> =0.303)
Smoking/Substance Use	No	-	-	-
	Yes	2.20 (0.94 to 5.16, <i>P</i> =0.069)	2.19 (0.76 to 5.96, <i>P</i> =0.134)	3.17 (1.01 to 9.49, <i>P</i> =0.042)
Mental or psychological conditions	No	-	-	-
	Yes	2.35 (1.33 to 4.12, <i>P</i> =0.003)	1.91 (0.89 to 4.01, <i>P</i> =0.091)	2.17 (0.87 to 5.26, <i>P</i> =0.088)
Parents' high expectations	No	-	-	-
	Yes	1.04 (0.61 to 1.80, <i>P</i> =0.885)	0.66 (0.31 to 1.44, <i>P</i> =0.290)	0.76 (0.30 to 2.01, <i>P</i> =0.571)
Satisfied with academic performance	Yes	-	-	-
	No	0.79 (0.47 to 1.32, <i>P</i> =0.369)	0.49 (0.23 to 1.02, <i>P</i> =0.058)	0.67 (0.28 to 1.62, <i>P</i> =0.372)
Satisfied with teachers	Yes	-	-	-
	No	1.32 (0.80 to 2.17, <i>P</i> =0.270)	2.21 (1.09 to 4.59, <i>P</i> =0.029)	1.19 (0.50 to 2.80, <i>P</i> =0.692)
Unhappy with love affairs	No	-	-	-
	Yes	2.94 (1.73 to 5.01, <i>P</i> <0.001)	2.41 (1.16 to 4.95, <i>P</i> =0.017)	1.79 (0.73 to 4.31, <i>P</i> =0.197)
Family history of attempt or death by suicide	No	-	-	-
	Yes	6.64 (3.08 to 14.87, <i>P</i> <0.001)	6.18 (2.68 to 14.14, <i>P</i> <0.001)	3.25 (1.11 to 8.73, <i>P</i> =0.023)
	Minimal or none	-	-	-
Depression category	Mild	1.08 (0.56 to 2.10, <i>P</i> =0.815)	1.07 (0.40 to 2.97, <i>P</i> =0.900)	0.58 (0.15 to 2.06, <i>P</i> =0.395)
	Moderate	2.71 (1.36 to 5.45, <i>P</i> =0.005)	1.76 (0.60 to 5.25, <i>P</i> =0.302)	1.16 (0.31 to 4.27, <i>P</i> =0.820)
	Moderately severe	3.41 (1.66 to 7.14, <i>P</i> =0.001)	2.65 (0.95 to 7.78, <i>P</i> =0.067)	2.69 (0.83 to 9.43, <i>P</i> =0.107)

There is a high incidence of suicidal thoughts among medical students in Bangladesh (approximately one in four). A family history of suicidal attempts or deaths increases the risk of ideation, planning, and attempt. Females are more vulnerable than males. To our knowledge, this is the first study conducted on medical students' suicidal behaviors in Bangladesh.

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Authors' contribution

The study was designed and conceptualized by MM, whose involvement included data collection and compilation, data analysis and interpretation, and manuscript preparation. In addition to analyzing and interpreting data, ER was also involved in preparing the manuscript. MSI contributed to data collection and manuscript preparation. ASMN and MSH critically reviewed and prepared the manuscript. CB, SI, and SMYA contributed to data collection, compilation, and manuscript preparation. All authors approved the final version of the manuscript.

Competing interests

The authors declare no conflict of interest.

Ethical approval

The Ethical Review Board of Biomedical Research Foundation

(BRF), Dhaka, Bangladesh approved the study (BRF/ERB/2019/008).

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