Original article

Suicidal ideation among medical students of Delhi

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Abstract

Background: *Suicide is emerging as a public health problem. The suicidal ideation is increasing amongst the younger age group, particularly students. However, little is known about this problem amongst medical students in India.* ***Method:*** *A cross sectional study (n=265) was carried out on undergraduate students of a medical college in Delhi using pre-tested and self-administered questionnaire consisting of items to assess socio-demographic profile, risk factors for suicide, and a validated scale to assess suicidal ideation and thought.* ***Results:*** *The prevalence of suicidal ideation amongst medical students was 53.6%. Although everybody was aware of the meaning of suicide and the damage that it could cause to the individual and family, still 4.9% students seriously contemplated suicide and 2.6% have attempted suicide at least once in their life. Suicidal ideation was highest in first professional year medical students (64.4%) and lowest among the third professional year students (40.4%). Suicidal ideation was significantly associated with 'impulsive or reckless behavior in difficult situations', feeling of being 'better off dead' and 'it's all too much to manage'. A significant association was found with gender and 'non-working mothers. However, no association of suicidal ideation or attempted suicides was found with age, father's education, and father's occupation.* ***Conclusion:*** *High prevalence of suicidal ideation amongst medical students suggests that there is an urgent need for a mental health program for medical students that provides counseling services and creates more opportunities for recreational activities.*

Keywords: *Suicide ideation, suicidal thought, medical student, mental health program.*

Introduction

Suicide (Latin suicidium, from sui caedere, "to kill oneself") is the act of a human being intentionally causing his or her own death.[1] It is due to a complex interaction of social, environmental, biological and cultural factors operating in an individual's life.[2] Some mental health problems carry a high risk of suicide during the course of the illness. Depression is one of the commonest conditions leading to suicide.[2]

Suicide has now become one of the major public health problems.[1] About 1 million people commit suicide every year worldwide, a global mortality rate of 16 per 100000, or one suicidal death every 40 seconds.[2,3] Worldwide, suicide rates have increased by 60% over the last 50 years, and the increase has been particularly marked in developing countries. China, India and Japan - because of their large populations - may account for up to 40% of all world suicides.[2] Suicide is becoming one of the leading causes

of death in India. According to recent estimates, more than 0.12 million people lost their lives by committing suicide in 2008, an increase of 1.9% over the year 2007 with a marked increase of 19.4% in suicide rate from 1998 to 2008. Amongst the states, West Bengal accounts for the highest percentage of suicides and Delhi has been reported to record the highest number of suicide cases among UTs in India.[4]

Although traditionally suicide rates were more among the male elderly, rates among young people have been increasing to such an extent that they are now the group at highest risk.[3] Out of the total number of suicides reported in India, 5% were estimated to be committed by students.[4] Study based on verbal autopsy conducted in Southern India showed that suicides account for about a quarter of all deaths in young men and between 50% to 75% of all deaths in young women.[5] Suicidal deaths were common in younger population than other age groups except age group of >65 year.[6] Studies from Vellore also report that major risk factors for suicide include presence of chronic stress and precipitating life events rather than severe mental disorders.[7] There are many reasons for committing suicide, prominent among them being 'failure in examination' (1.6%) and 'professional/career problem'(1%).[4] Statistics indicate that more and more students are opting for suicide every year as a means to "end their suffering" which could be prevented by timely intervention.[8] Even in India, it was found that higher percentage of school adolescents seriously contemplated suicide and made an attempt to commit suicide.[9]

Medicine is one of the most stressful professions. Death by suicide is a major occupation hazard amongst physicians. This increased risk may begin during medical school.[10] Available studies suggest that the suicide rate among medical students is higher than in the age-matched population. Suicide is reported to be the second most common cause of mortality among medical students in USA.[11] It is well known that suicidal ideation is a predictor of suicidal planning and attempts.[11] Also, it is more common than suicidal attempts or completed suicide.[12] Several multi-institutional studies reveal that medical students have lower mental quality of life and thus, increased suicidal ideation.[10,13] However, there is paucity of data on suicidal ideation and thought among medical students especially in India.[14] The current study was an endeavor to investigate the prevalence of suicidal ideations and the associated factors amongst medical students of Delhi.

Materials and Method

Setting and Sampling

This was a descriptive cross-sectional study carried out amongst undergraduate medical students of a convinently selected medical college located in Central Delhi. It is a state government run medical college attached to three tertiary care hospitals including an eye center. Every year about 200 students get admitted to the medical college through a pre-medical test The undergraduate medical study in India has been divided into four professional years spread over a span of four and half years and one year of mandatory internship. The study was approved by the Institutional Ethics Committee, Maulana Azad Medical College, New Delhi.

Participants included both females and males aged 17-30 years, randomly selected from all the batches of undergraduate medical course i.e. from first year to internship. As the information about the prevalence of suicidal ideation was not available, the sample size of 200 was calculated on the basis of expected prevalance of attempting suicide among

students, which was 15 percent,[15] and worst acceptable prevalence rate was taken as 10 percent with 95 percent confidence interval. However, 265 students were included in the study. Every effort was made to include an equal number of students from each professional year but due to ongoing examinations and vacations in some professional years, equal contribution from each year could not be procured. Second professional year comprise of two batches of students, in the third and fifth semester because second professional year is of one and a half year's duration and therefore, it accounted for higher number of participants in this group than students in other professional years.

Study tool

A questionnaire was designed based on various risk factors for suicide enlisted in the validated scale[13] and was pretested before the commencement of the study, in a pilot study done on 10 students of a different medical college. The questionnaire consisted of items on socio-demographic profile, risk factors for suicide such as chronic illness, significant life change, death of a close one, family history of psychiatric illness, physical problem, etc. Suicidal ideation for an individual student was considered positive when she/he responded positive on item 18 to 24 in the questionnaire (Appendix 1).

Procedure

Students of the college studying in different batches were listed. From the list, a minimum of 50 students were selected at random with the help of simple random table from each professional year and were contacted. The questionnaires were distributed on the spot. The study subjects were briefed on the purpose of the study and assured privacy and confidentiality of the information provided by them. Their informed consent was also obtained at that time. The subjects were given half an hour to complete the questionnaire. Every effort was made to maintain the anonymity of the response sheet and the respondent. All the subjects were informed that they could seek professional help if they desired or if required, from Department of Psychiatry (in the hospital associated with medical college).

Statistical analysis

Data collected was coded, fed in MS office excel and analysed using Epi-info 2005 software of World Health Organisation. The results were presented in proportions and any difference between two proportions in relation to particular factor was assessed by chi-square (or fisher exact test if expected frequency in any of the cell was less than 5) and was considered significant if probabiity of error was less than 5%. In table 1 proportions of suicidal ideation were compared with sociodemographic factors. Suicidal ideation was assessed for each variable using chi-square. In table 2 trend chi-square was used because the professional groups were from first to Interns with degree of freedom.[4]

Results

Out of the total 265 participants, there were 138 (52.1%) males and 127 (47.9%) females. The mean age for participants of first professional year students was 18.9 years whereas it was 20.1 years for second professional year students. The mean age for third and fourth professional year students were 21 years and 22.1 years respectively while interns aged 23.4 years on average. Maximum proportion of participants were from second professional year (40%) followed by first professional year (22.3%).

Majority of the students' parents were professionals with postgraduate qualification

(Father: 62.3% and mothers: 43.4%) and higher proportion of participants had working mothers (43.4%). The demographic profile of participants is presented in Table 1.

The study showed that the overall prevalence of suicidal ideation among the sample of medical students was 53.6%. 2.7% of them had also attempted to commit suicide at least once. The difference in the prevalence of suicidal ideation among males and females was found to be statistically significant (Chi square = 7.29; df = 1; p = 0.006) with 45.6 % of males and 62.2% females showing suicidal ideation (Table 1).

Table 1. Socio-Demographic characteristics of the medical students

Subject characteristics		Total sample		Suicidal Ideation	
		N	%		
All sample		265	100	142	53.6
Gender					
Male		138	52.1%	63	45.6%
Female		127	47.9%	79	62.2%
Professional year	Mean Age (yrs)				
I (1st + 2nd sem)	18.89	59	22.3%	38	64.4%
II (3rd sem + 5th sem)	20.13	90	40.0%	51	56.7%
III (6th + 7th sem)	21.0	47	17.7%	19	40.4%
IV (8th + 9th sem)	22.14	33	12.4%	18	54.5%
Intern	23.39	36	13.6%	16	44.4%
Religion					
Hindu		243	91.7%	129	53.1%
Muslim		8	3.0%	6	75.0%
Others		14	5.3%	7	50.0%
Father's Education					
Professional/Post Grad		167	63.0%	85	50.9%
Graduate/lower grades		98	37.0%	56	57.1%
Father's Occupation					
Professional/Semi Professional		165	62.3%	83	50.3%
Clerical/Business		91	34.3%	53	58.2%
Others		9	3.4%	6	66.7%
Mother's Education					
Professional/Post Grad		115	43.4%	61	53%
Graduate/lower grades		150	56.6%	81	54%
Mother's Occupation					
Working		115	43.4%	60	52.2%
Housewife		150	56.6%	82	54.7%
Belief In God					
Yes		207	78.1%	115	55.6%
No		58	21.9%	27	17.1%
Impulsive Behavior*					
Yes		151	57.0%	107	70.9%
No		114	43.0%	35	30.7%
Too Much To Manage*					
Yes		132	49.8%	103	78%
No		133	50.2%	6	4.5%

*$p < 0.05$; df is different for different groups.

Table 2. Distribution of suicidal ideations according to professional year of medical students

Questions/ professional year	Professional Year										Total (N=265)	
	I (n=59)		II (n=90)		III (n=47)		IV (n=33)		Intern (n=36)			
	Yes	%	Yes	%	Yes	%	Yes	%	Yes	%	Yes	%
Impulsive/ Reckless behavior*	29	49.2	72	80#	18	38.3	18	54.5	14	38.9	151	57
Too much to manage*	38#	64.4	45	50	18	38.3	18	54.5	13	36.1	132	49.8
Ending it all	12	20.3	22	24.4	5	10.6	8	24.2	8	22.2	55	20.8
Becoming Desperate	9	15.3	13	14.4	2	4.3	3	9.1	7	19.5	33	12.5
Thoughts of Suicide	9	15.3	18	20	3	6.4	6	18.2	6	16.7	42	15.9
Better off dead	5	8.5	18	20	3	6.4	2	6.1	3	8.3	33	11.7
Contemplated suicide	2	3.4	8	8.9	2	4.3	0	0	1	2.8	13	4.9
Attempted Suicide	1	1.7	5	5.6	1	2.1	0	0	0	0	7	2.6

Note *$p < 0.05$, df = 4; # $p < 0.05$, df = 1.

The different stages of training (professional years) showed no statistically significant association with suicidal ideation although it was found to be highest in first professional year (64.4%) and lowest in third (40.4%) (Table 3).

No significant association was observed between suicidal ideation and belief in God. 55.6% of believers and 17.1% of non-believers have reported to be having suicidal ideation. However a statistically significant association was found between suicidal ideation and impulsive/reckless behavior. Suicidal ideation rate was significantly higher in subjects showing impulsive behavior in difficult situations i.e. 70.9%, as compared to 30.7% among those reported not showing such behavior (Chi square = 42.12; df = 1; $p < 0.001$). Another observation worth noting is that the prevalence of impulsive behavior was as high as 57% among the students. Significant association (Chi square^2 = 148, df = 1, $p < 0.001$) between suicidal ideation and the feeling of "it's all too much to manage" was also observed. 78% of students having suicidal ideation also felt that it is "all too much to manage for them" as compared to 4.5% of those not reported having such a feeling (Table 1).

Comparisons of responses to individual questions on suicidal ideation in different professional years are shown in Table 2. Second year medical students in this study reported significantly higher rate of impulsive behavior (80%) (chi square = 15.24, df = 1, $p = 0.0001$). Also third professional showed the lowest i.e. 38.3% For the question regarding the student's feeling that it was all too much to manage for them, the rate reported by the first year students were the highest, i.e. 64.4% and the lowest rate was reported by the interns, i.e.36.1%.

Comparisons on prevalence of positive responses to individual questions about suicidal ideation by mother's education and occupation (Housewife/Working) are shown in Tables 3 and 4. Attempted suicide rates reported were higher among medical students whose mothers were housewives (4%) than the children of working women (0.9%). Again, the difference is not statistically significant (chi square=2.48, df=1, p=0.11). However a statistically significant association was observed between mother's occupation and the feeling of being "better off dead". 15.3% of students having non working mothers reported they have this feeling as compared to 7% of students having working

mothers (p=0.03). As far as the mother's education is concerned a general increasing trend with the decreasing level of education was observed for most of the questions. No Significant association was noted between attempted suicide and mother's education. No significant association was found between suicidal ideation and father's education or occupation.

suicidal ideation in 53.6% of the medical students. Although everybody was aware of the meaning of suicide and damage that it causes to the individual and family, still 4.9% students were found to have seriously contemplated suicide and 2.6% were found to have attempted to commit suicide at least once in their life. However, these levels were lower than the previous Indian study done on adolescents of

Table 3: Distribution of suicidal ideations among medical students according to mother's education

Questions/Mother's education	Post Grad/ Professional (n = 115)		Graduate (n = 110)		Lower (n = 40)	
	Yes	%	Yes	%	Yes	%
Attempted Suicide	1	0.9	3	2.7	3	7.5
Better Off Dead	9	7.8	16	14.5	6	15
Contemplate suicide	5	4.3	4	3.6	4	10
Ending It All	21	18.3	25	22.7	9	22.5
Impulsive Behavior	67	58.3	61	55.5	23	57.5
Thoughts Of suicide	18	15.7	17	15.4	7	17.5
Becoming Desperate	15	13.0	13	11.81	6	15
Too Much to manage	56	48.7	57	51.8	19	47.5

$p > 0.05$, df = 2

Table 4: Distribution of suicidal ideations among medical students according to mother's occupation

Questions/Mother's occupation	Housewife (n=150)		Working (n=115)	
	Yes	%	Yes	%
Impulsive behavior	83	55.3%	68	59.1%
Becoming Desperate	20	13.4%	14	12.2%
Too much to manage	76	50.7%	56	48.7%
Thoughts of Suicide	25	16.6%	17	14.8%
Better off Dead*	23	15.3%	8	7.0%
Contemplate suicide	8	5.3%	5	4.3%
Ending it all	34	22.7%	21	18.3%
Attempted Suicide	6	4.0%	1	0.95

* $p < 0.05$, df=1

Discussion

The descriptive cross-sectional, self administered questionnaire based study in a Medical College of New Delhi, India revealed

South Delhi (15.8% contemplated suicide, 5.1% attempted suicide).[11] This could be because most of the students in this study were within the 19-24 years (post-adolescent) age group and thus,

more emotionally mature to handle stress and also the fact that adolescence is considered as one of the most turbulent and emotionally unstable phases of life, thus, leading to higher prevalence of suicidal thoughts among them. This fact is supported by the findings of a study done on Norwegian post graduate medical students with 8% contemplating suicide while only 1.3% actually attempting it.[16] contrasting results were observed in a US based study done on college students from various universities, where 15% of the students having 'seriously considered attempting suicide' and 5% actually attempting suicide, probably due to different sociocultural settings including the strong family support system in Indian society.[17]

Distribution of suicidal ideation across the different stages of training in the medical program was 64.4% among first year students, followed by second year students with 56.7%, fourth year students with 54.5% and 44.4% among interns. The suicidal ideation rate was lowest (40.4%) among the third year medical students. This observation could possibly be due to the varying academic stress and examination pressure in different stages of training, it being higher in the first, second and fourth year and lowest in the third year. Also, first year medical students are facing challenges to be acclimatized to the new life and curriculum of the medical school. The relationship between academic stress and suicidal ideation as reported in the literature,[18] is therefore supported by the data reported in this study.

There was a significant difference between males and females with respect to suicidal ideation, similar to findings reported in the South Delhi based study.[9] Suicidal deaths were more more common in young females as compared to males according to the studies carried out in South India. [5-7] A similar study on Brazilian medical students has also shown a trend of higher suicidal ideation rate among females but it was not statistically significant.[19] Females studying in a medical college are subjected to stress over and above that faced by their male counterparts such as the issues of security and the societal pressure on them to be at par with their male counter-parts. Similar conditions also prevail in Brazil.[19] While, results obtained from a study on medical students in USA had showed no association between suicidal ideation and gender, thus further supporting the cause.[8]

One interesting finding from this study is that medical students who believe in God had reported significantly higher rate of suicidal ideation in comparison to students who are non-believers. In the context of this study, other factors like academic stress etc seem to outweigh the effect of religious and spiritual belief. This is similar to findings reported from a cross cultural case control study done in many countries including India where protective effect of religiosity towards suicidal ideation was not observed.[20] However, conflicting results have also been found in studies on African-Americans where higher suicidal ideation and attempts were reported amongst those who are not believers of God.[21]

A significant association was found between students showing 'impulsive or reckless behavior in difficult situations' and suicidal ideation. Similar association is also observed in suicidal ideation and the feeling of 'it is all too much to manage.' Showing impulsive behavior in difficult situations" has been found to be one of the risk factors for suicide.[14] Our study provides empirical evidence in supporting this current theory and its applicability to the special subgroup of the general population i.e. medical students. The prevalence of impulsive behavior as reported by the subjects in this study is as high as 57%. This

observation highlights some concerns and follow-up investigation from the relevant stakeholders is warranted.

The observation of statistically significant associations between the feeling of being 'better off dead' and 'non-working mothers' in this study is in contrast to the findings reported in the study of suicidal ideation amongst school adolescents of south Delhi and Chandigarh. [9,22] The concept of emotional conditioning may help explain this observation. The children of working mothers are independent since very young age and are more exposed to handling day to day and other stressful activities alone as compared to children of housewives who receive their mother's protection and care till a much later age thus making them more emotionally dependent on their mother. As a result, when the students arrive in the medical college and are exposed to the stressful environment of the college, the children of working women are able to cope better since they have been emotionally conditioned to handle such environments independently and without any family support.

No significant association of suicidal ideation or attempted suicides was found with age, father's education and occupation as seen in previous study carried out in the same college[23] but in contrast to the South Delhi based study[9] where significant associations were reported.

In terms of study design, efforts have been made in recruiting a representative sample across the stages of training , gender, and parenting education and occupational status. However, the representation from each stage of training ends up not uniform due to the constraints explained in the methodology section. Readers are therefore cautioned to take note of this limitation when interpreting the data, particularly in making comparisons across the stages of study. Secondly, we would like to acknowledge also that each suicidal ideation indicator as expressed in the questionnaire items has no objective definition or criteria; hence different subjects may have interpreted it differently, thus resulting in response bias. Thirdly, it may also be worth noting that results reported from this case study were based on the observation over the study period, which may vary over different periods of time. Other factors that may also be associated with suicidal ideation such as whether the subject stays in hostel have not been considered in this study. As the focus of this paper is not to investigate the causal relationship of suicidal ideation and other risk factors, multi-variate analysis was not carried out and reported here. Finally, generalizability of the results of this tudy is limited because the sample was recruited from a single medical college.

Limitations not withstanding, it can be concluded that since such a high prevalence of suicidal ideation amongst medical students was reported in this study, which certainly places the medical students involved at risk of suicide, there is an urgent need for a mental health program for medical students that provide for counseling services available to anyone who wishes to use them. More supports need to be given to first, second and fourth year medical students in the context of study, such as providing more opportunity for recreational activities and possibly restructuring of the medical curriculum to redistribute the academic loads in different stages of training.

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Appendix 1

Questionnaire for assessment of suicidal risk

Note: All the information sought in this questionnaire would be used only for research purposes and thus would be kept strictly confidential. This is an anonymous study and no effort will be made to trace back any respondent. However, one is free to seek help voluntarily if he so desires.

Instruction: Please tick the appropriate answer among the options provided.

Y= Yes, N= No/Never, D= Do not know, NA= Not applicable, O= Often, S= Sometimes

1. Gender	M / F
2. Age (in years)	_____
3. Religion	_____
4. Presently studying in which semester?	_____
5. Father's education and occupation?	_____
6. Mother's education and occupation?	_____
7. Do you believe in God?	Y / N / D
8. Do you have a history of any substance abuse in the past or present?	Y / N / D
9. Did you suffer from any major illness requiring hospitalization in the past 6 months?	Y / N / D
10. Are you suffering from any chronic illness (DM/ COPD/ Cardiac)?	Y / N / D
11. According to you what is the meaning of suicide?	_____
12. Do you believe that suicide is wrong?	Y / N / D
13. Has there been any death in the family or friends which you think has seriously affected you?	Y / N / D
14. Do you become impulsive or show reckless behavior in difficult situations?	O / S / N
15. Has a significant life change occurred in the past 6 months that you think has affected your life seriously?	Y / N / D
16. Do you think that just by virtue of your gender you have been discriminated by your parents or other people?	Y / N / D
17. Do you think that you are becoming desperate?	Y / N / D
18. Do you get the feeling that it is all too much for you to manage?	O / S / N
19. Have you ever thought of ending it all, that life is not worth living?	O / S / N
20. Do you have thoughts of suicide/death?	O / S / N
21. Do you think that you would be better off dead?	O / S / N
22. Did you ever contemplate to end your life?	Y / N / D
23. If so did you fix some time and place for the same?	Y / NA
24. Have you ever made an attempt to end your life?	Y / N / D
25. If so how many?	One / More than one / NA
26. Do you have a family history of suicide/attempted suicide?	Y / N / D
27. Do you have a history of any diagnosed psychiatric illness presently or in the past?	Y / N / D
28. If your response to the previous question was "yes" then what was the diagnosed illness?	