Prevalence & Socio-demographic Risk Factors of Suicidal Behavior and effects of various coping Strategies on Suicidal Behavior among Medical Students: A Institution-Based Cross-Sectional Study

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Abstract

Background: Suicidal behaviour in medical students might be brought on by mental pressures and the adoption of inadequate coping mechanisms.

Objective: The purpose of this study is to assess the prevalence, risk factors, and effects of coping strategy elements on suicidal behaviour among medical students.

Methodology:Medical College students participated in a three-month institution-based cross-sectional survey from October to December 2022. Using the stratified random sampling procedure, a total of 350 study participants were chosen and then distributed proportionally to each academic year. The Patient Health Questionnaire-9, Suicidal Behaviors Questionnaire-Revised, and sociodemographic information were then included in a self-administered questionnaire that the participants were required to complete (SBQ-R). The risk factors and their correlation with suicidal conduct were identified using the chi-square test and the student t test.

Results: A total of 62 (17.7%) respondents reported having suicidal behaviour and an SBQ-R cutoff score greater than 7. The age range of the participants was 18 to 35 years, with a mean age of 22.28 ± 1.87 years . Depression, academic performance dissatisfaction, smoking and alcohol use were the found risk variables substantially linked to greater suicide conduct. ($P<0.05$) In the study population, psychological resilience (68.6%), religion, and humour (60.3%) were the coping mechanisms that were employed more frequently than supportive techniques (54%). Coping with mental disengagement and coping with supportive techniques were examined as a protective factor for suicide behaviour. Mental disengagement (denial, drug use, venting, behavioural disengagement, and self-blame) was a seldom employed coping strategy (21.7%) among medical students. (($P<0.05$)

Conclusion: The prevalence of suicidal conduct among medical students is worrying, and research has shown that risk factors include depression, alcohol and tobacco use, as well as inadequate coping mechanisms. The data suggests that the initial steps in preventing suicidal conduct should be quantification of the problems, early treatment, and proactive student counselling to assist them adopt the proper coping mechanisms.

Keywords: Suicidal behavior , Medical students, Risk factors, coping strategies

Introduction

Suicidal ideation and its effects, such as suicidal thoughts, plans, attempts, and accomplished suicide, are together referred to as suicidal conduct. It is a notable addition to the global burden of disease and is the outcome of intricate relationships between bio-psycho-social, environmental, and cultural factors.[1,2]

The research came to the conclusion that future medical workers are more likely to engage in suicide behaviour than students in other courses and the general public. Despite being a serious public health crisis, suicidal conduct is one of the ignored issues among younger medical students. It was regrettable for the medical students that they had to deal with multiple mental strains in the beginning of their studies and were overworked until they became skilled doctors, which exacerbated the psychological issues already there.[1,3]

Poor mental health or inadequate coping mechanisms may cause medical students to give up their careers, which may result in suicidal conduct. According to recent studies, medical students had a lifetime prevalence of suicide ideation and behaviour ranging from 1.3% to 32.7% and 1.0% to 53.6%, respectively. It was shown that medical students experience extreme mental stress, which is not only caused by academic or professional problems but also by long-term non-academic problems such personality disorders and severe life events. The risk of suicide behaviour has previously been shown to be significantly higher in medical students with a family history of mental diseases, suicidal ideation, prior psychiatric disorders, life unhappiness, low self-esteem, and reduced social involvement. However, information on suicide conduct and the risk factors that contribute to it is scarce. More data on suicide behaviour and associated risk factors in Indian medical students is required due to the paucity of available research, as early detection might assist to mitigate the problem and set up effective interventions.[4-7]

Individuals utilise coping mechanisms, which are dynamic processes including cognitive and behavioural attempts, to understand the ideas, feelings, and behaviours encountered throughout diverse stressful situations. However, the diverse coping skills of medical students to alleviate the suicidal behavior is emphatically pronounced across the globe but the available research in conceptualizing and classifying the distinct coping strategies is inconsistent.[8-9]

Appropriate coping techniques predict positive future outcomes, include greater levels of ego development and self-esteem, include fewer psychological or behavioural issues, and deter suicidal behaviour even in the presence of stress. In contrast, a small number of studies have consistently shown that ineffective coping techniques can result in unfavourable emotions and increase the risk of suicidal behaviour when faced with stress. Studies on students also revealed that unhelpful coping mechanisms with the goal of sustaining wellbeing (such as lowering stress-

related unpleasant emotions and momentarily shifting the emphasis from stressful situations to other important things) could prevent suicide behaviour.[10-12]

As far as we are aware, there aren't many researches that have examined suicide conduct, its risk factors, various coping mechanisms, and their impacts on suicidal behaviour in medical students in an Indian context. In order to identify the dimensions of coping strategies and their impact on suicide behaviour in medical students in a tertiary care institution, the current study has attempted to gauge the severity of suicidal conduct and the risk factors affecting it.

Methodology

Between October 2022 and December 2022, undergraduate and graduate medical students participated in this descriptive cross-sectional study. About 120 undergraduate students and 60 postgraduate medical students are accepted into the college each year. Approximately 800 medical students are enrolled at this university right now. The Institutional Ethical Committee Board gave its approval for this study's ethical conduct, and it was carried out in accordance with the Helsinki Declaration and Ethical Committee guidelines. Participants' identity and confidentiality were preserved throughout the study because no questions requesting their name or contact information were asked.

Utilizing a single population proportion calculation, the necessary sample size for the study (N = 350) was determined. The following assumptions were used to calculate it: the prevalence or expected proportion of suicidal behaviour (P), which was determined by a previous survey to be 29.6%[13]; the absolute precision (d), which is 5%; the 95% confidence interval (CI), which has a Z value of 1.96 (constant); and the nonresponse rate, which was also assumed to be 10%.

Medical officials, house-officers, and consultants were excluded from the study, as were students from all batches of undergraduate and postgraduate programmes who were 18 years of age or older (both male and female), able to read and understand English, and willing to provide informed permission.

The students of each academic year were divided into strata using a stratified random sampling technique, and the total sample size was then proportionally distributed to each academic year of undergraduates (1 to 4 and internship) and postgraduates. Finally, each study participant was chosen and included from various academic years using a computer-generated random number table. The participants were informed of the study's objectives and the value of providing truthful responses, and their information was likewise treated in confidence. Then, before gathering the necessary information from the chosen participants, written informed consent was obtained from them and questionnaire papers were personally handed to them in their classrooms before lectures and during breaks. All of the responders were told they could get any assistance they needed from the department of psychiatry.

Self-administered questionnaires with six sections (A to F) were used to gather the data. Sections A, B, and C of the questionnaires contained basic information on the students as well as brief descriptions of the study's objectives. The Patient Health Questionnaire-9 (PHQ-9) was used in

Section D to gauge how depressed the students were. Section E of the questionnaire consisted of four questions from the Suicidal Behaviors Questionnaire-Revised (SBQ-R) scale, which measures suicidal behaviour. The coping inventory was the last section of the questionnaire, and it was used to examine the coping mechanisms used by the pupils.

Seven questions about fundamental characteristics were asked in this section of the survey, including current age, gender (male/female), residence (urban/rural), year of study, satisfaction with academic performance (satisfied/unsatisfied/can't say), and whether or not they smoke or drink alcohol (yes/no).

The nine-item depression module of the Patient Health Questionnaire-9 Scale (PHQ-9) is simple to administer. How frequently the depressive symptoms plagued the participants over the previous two weeks was a question that was posed to them. Each item is given a score between 0 and 3, where 0 equals not at all, 1 means a few days, 2 means more than half the days, and 3 means almost every day. A total score might be between 0 and 27. "0-4 = minimum," "5-9 = mild," "10-14 = moderate," "15-19 = moderately severe," and "> 20 = severe" are the different levels of depression. In the context of the current study, two groups were formed during the analysis utilising scores of 10 for nondepressed group and > 10 for depressed group.

The SBQ-R, or Suicidal Behaviors Questionnaire-Revised, is a highly helpful tool for assessing the various aspects of suicidality. It includes four questions that assess lifetime suicidal ideation, suicidal plan, and suicide attempt (item 1, 4 points), frequency of suicidal ideation over the previous year (item 2, 5 points), threat of suicide attempt (item 3, 3 points), and self-reported likelihood of suicidal behaviour in the future (item-4 with 6 points). Item 1 question #2 was utilised in the current study to measure lifetime suicidal ideation, item 1 question #3a and #3b measured suicide plan, and item 1 question #4a and #4b measured suicidal attempt. The threshold score for identifying kids who were acting suicidally was a total computed score greater than 7. Responses can be used to spot risky people and certain risky activities.

Using the chosen 14 items from the Brief Coping Orientation to Problems Experienced (Brief-COPE) scale, the students' coping strategies were evaluated. "These items deal with how you have been coping with the issues in your life," said the instruction regarding coping mechanisms in the scale. A 4-point Likert-type scale is used to rate these items, with 1 denoting "I have not been doing this at all" and 4 denoting "I have been doing this a lot." The prefinal version of the questionnaire was subsequently assessed on 20 randomly selected medical students in order to assess its context clarity, layout, language transparency, ease of comprehending the content and use, and response comprehensibility. None of these pupils had any issues comprehending the material or responding to the questions. Therefore, the self-administered questionnaire for the present research was finally chosen with these 14 items reflecting each coping technique.

Software known as Epi info version 7 was used to enter and evaluate the data. When comparing categorical variables, the chi-square test (or Fisher's exact test, if the frequency in any cell was

less than 5) was used to obtain frequencies and percentages. A separate Student's t-test was used to compare continuous variables' means and standard deviations. The link between suicidal behaviour and specific coping strategy aspects was determined using Pearson's correlation. Chi square and student t test were used to evaluate the strength of association between independent factors and suicidal behavior. Statistically significant level was set at $p < 0.05$.

Results

350 medical students participated in the current study, which was conducted. Out of them, 201 (57.4%) of the medical students were female, and the remaining students were all male. The participants' ages ranged from 18 to 35 years, with a mean age of 22.28 years (standard deviation: 1.87). The age group of 18 to 20 years was followed by the age group of 141 participants (40.3%), with 188 participants (53.7%) in this age range. The majority of them (56.7%) were from rural areas. The majority of medical students—the remaining 165—were content with their academic performance, but nearly half—47.1%—were not. Additionally, 49 (14.0%) and 70(20.0%) of the individuals said they drank alcohol and smoked tobacco, respectively. Only 213 (60.9%) of the medical students had any depression symptoms. A significant portion of medical students—137, or 39.1%—were moderately to seriously depressed (PHQ-9 score > 10). (Figure-1)
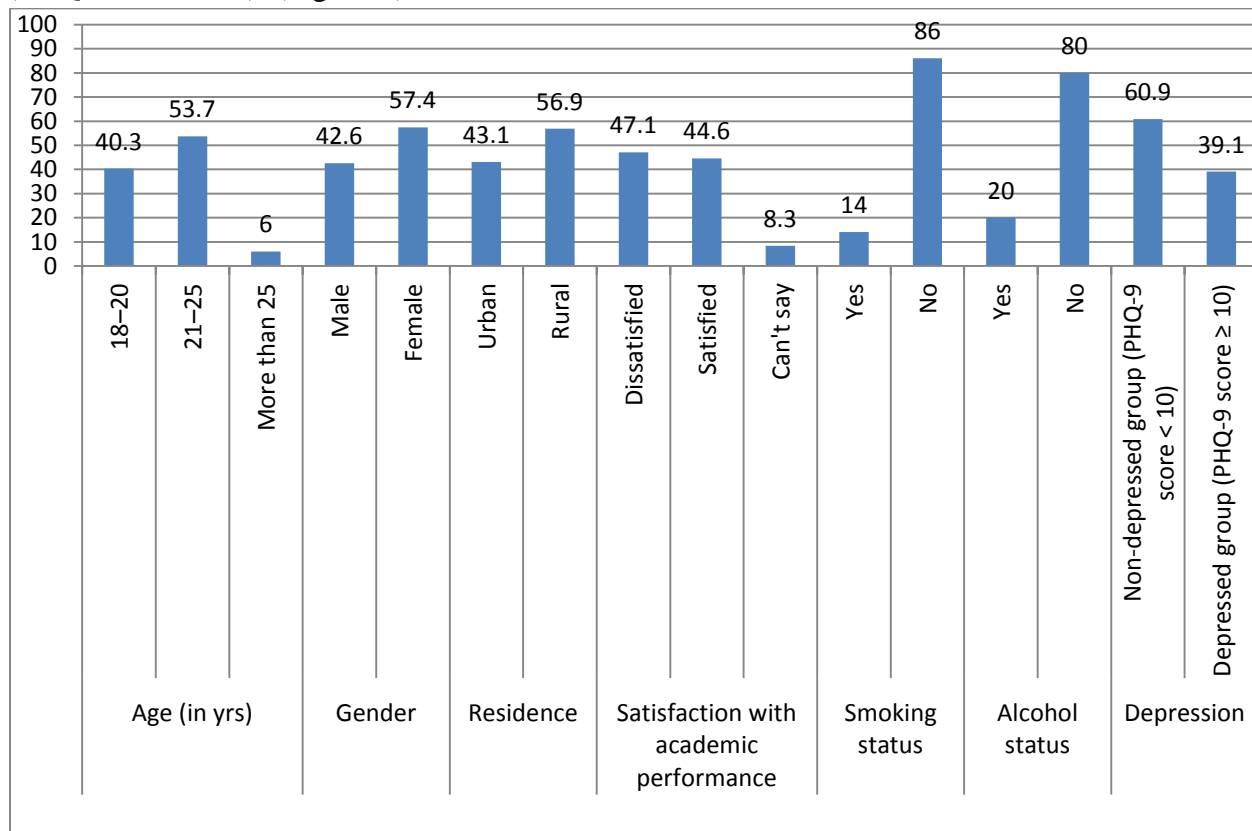
Figure 1: Socio-demographic characteristics of medical students with prevalence of suicidal behavior in subgroups

A total of 62 (17.7%) respondents had reported SBQ-R cutoff score $\geq$ 7 and had suicidal behavior. (Figure-2)
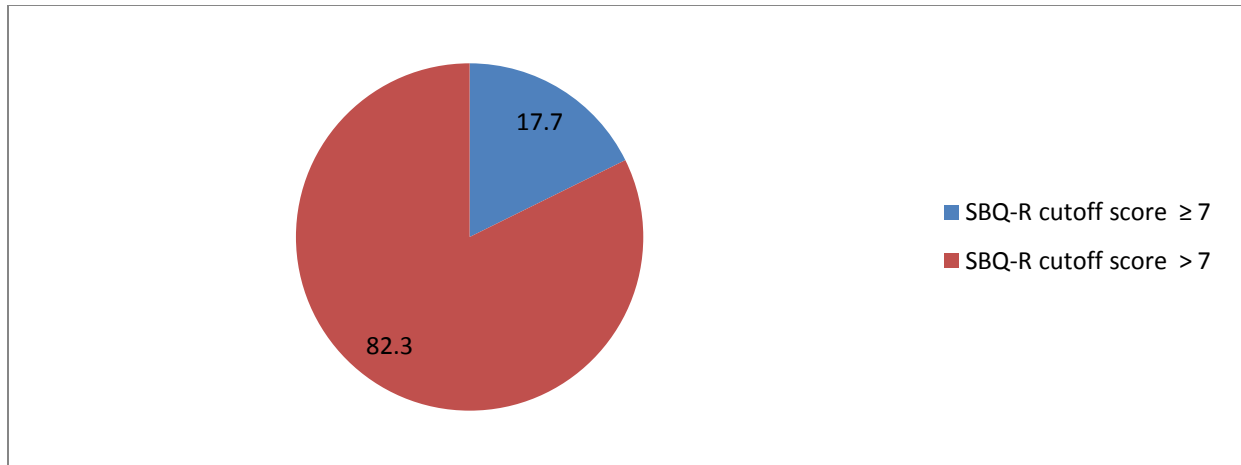
Figure-2: SBQ-R cutoff score

Males (53.2%), students between the ages of 21 and 25 (59.7%), and residents of rural areas (58.1%) were shown to have a greater prevalence of suicide conduct, but these factors were not substantially linked to it. Chi-square analysis revealed that more students in the suicidal group (74.2% vs. 22.6%) were substantially unhappy with their academic performance. Students with moderate to severe depression symptoms were substantially more likely to engage in suicide behaviour (71.0 vs. 29%). The study also reveals a substantial relationship between students' drug and alcohol use and suicidal conduct. (77.4% against 22.6% and 71.0% against 29.0%, respectively) (Table-1)

Sr. no.	Variables	Subgroups	Groups						p – Value
			Total medical students (N = 350)		Non-suicidal group (SBQ-R score < 7) (N = 288)		Suicidal group (SBQ-R score ≥ 7) (N = 62)		
			n	%	n	%	n	%	
1	Age (in yrs)	18–20	141	40.3	119	41.3	22	35.5	0.58
		21–25	188	53.7	151	52.4	37	59.7	
		More than 25	21	6.0	18	6.3	3	4.8	
2	Gender	Male	149	42.6	116	40.3	33	53.2	0.06
		Female	201	57.4	172	59.7	29	46.8	
3	Residence	Urban	151	43.1	125	43.4	26	41.9	0.83
		Rural	199	56.9	163	56.6	36	58.1	
4	Satisfaction with academic performance	Dissatisfied	165	47.1	119	41.3	46	74.2	< **0.001**
		Satisfied	156	44.6	142	49.3	14	22.6	
		Can't say	29	8.3	27	9.4	2	3.2	

5	Smoking status	Yes	49	14.0	35	12.2	14	22.6	**0.03**
		No	301	86.0	253	87.8	48	77.4	
6	Alcohol status	Yes	70	20.0	52	18.1	18	29.0	**0.04**
		No	280	80.0	236	81.9	44	71.0	
7	Depression	Non-depressed group (PHQ-9 score < 10)	213	60.9	195	67.7	18	29.0	**< 0.001**
		Depressed group (PHQ-9 score ≥ 10)	137	39.1	93	32.3	44	71.0	

Table-1: Prevalence of Suicidal Behavior on SBQ-R and its Association with sociodemiographic Variables

In the study population, psychological resilience (68.6%), religion, and humour (60.3%) were the coping mechanisms that were employed more frequently than supportive techniques (54%). According to Table-2 & Figure-3, among medical students, mental disengagement (denial, substance use, venting, behavioural disengagement, and self-blame) was a rarely employed coping mechanism (21.7%).

	Total		Non suicidal Group		Suicidal Group	
	N	%	N	%	N	%
Psychological resilience	240	68.6	193	80.4	47	19.6
Supportive strategies	189	54.0	162	85.7	27	14.3
Religiosity and humour	211	60.3	172	81.5	39	18.5
Mental disengagement	76	21.7	41	53.9	35	46.1

Table-2: Coping strategies in the study participants
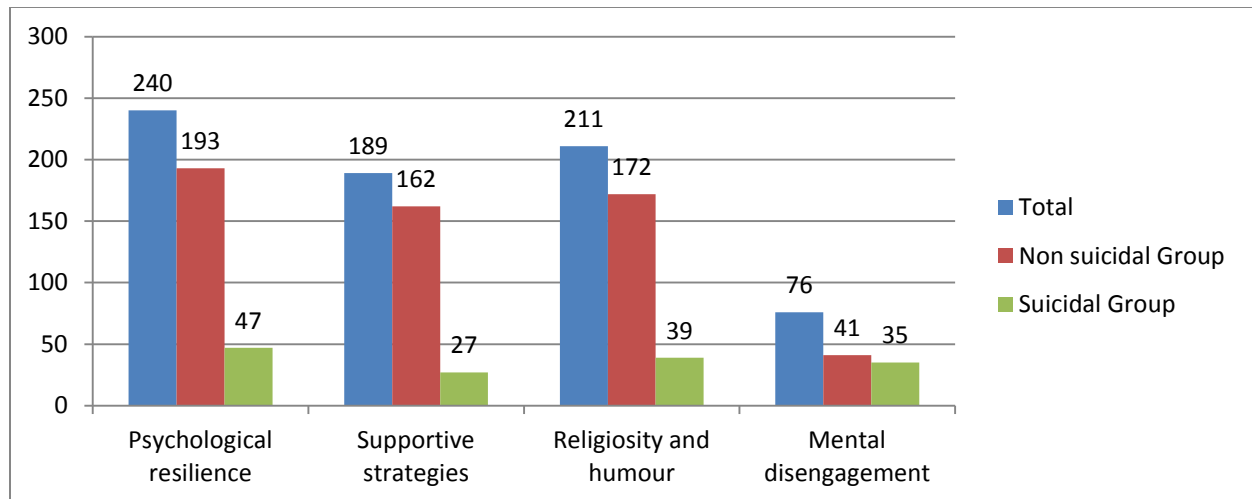
Figure 3: Components of coping strategies adopted by medical students

Table 3 displays the mean score for each coping strategy component as well as statistically significant differences between the suicidal and non-suicidal groups. While mental disengagement was significantly employed by students in the suicidal group (8.902.98 vs 11.793.45), supportive methods were significantly used by students in the non-suicidal group (5.241.77 vs 4.611.81). Table 3 also shows the correlational analysis between these two variables. Suicidal behaviour was weakly inversely correlated with supportive methods among respondents (r = 0.156, P 0.011), which helped to explain why using this component more frequently was linked to a reduced prevalence of suicidal conduct. A moderately favourable correlation between suicidal behaviour and mental disengagement was also found (r = 0.404, P 0.001), explaining why more frequent use of this component was linked to a higher prevalence of suicide behaviour among medical students (Table 3).

	Total Mean	Non suicidal Group	Suicidal Group	p value	Suicidal Group (r)
Psychological resilience	15.02±2.55	15.19±3.73	14.84±2.75	0.485	-0.031
Supportive strategies	5.11±1.79	5.24±1.77	4.61±1.81	0.011	-0.156
Religiosity and humour	5.71±1.49	5.75±1.52	5.49±1.39	0.215	-0.087
Mental disengagement	9.47±3.27	8.90±2.98	11.79±3.45	<0.001	0.404

r=Pearson correlation coefficient

Table 3: Comparison of the responses to the components of coping strategies used by medical students and their correlation with suicidal group

Discussion

According to this analytic cross-sectional study, one-third of medical students have suicide thoughts, and nearly one-fifth of them also engage in suicidal behaviour with a few risk variables (academic performance dissatisfaction and depression) contributing to it. However, focusing only on suicidal conduct may serve to improve medical students' mental health.

According to the current study, 17.7% of medical students displayed suicidal behaviour, which is higher than the general population's rate (SBQ-R > 7). (10.6 per 100,000 population).[14] These results are consistent with those from study[15] conducted among Indian medical students, where the prevalence rate was given as 16.7. Suicidal conduct is very common, and it may be because medical students act selfishly and have issues with their family, friends, and relationships. Studies carried out in India[13] were judged to have a lot greater prevalence of suicidal behaviour on the SBQ-R than the current study, while a study carried out in Malaysia[16] revealed a much lower prevalence (7%) rate than the current study.

A few authors from Ethiopia[17] and Portugal[18] established a significant association where alcohol consumption behaviour increases more than two times odd risk of suicidal behaviour among medical educators, which is consistent with the findings observed in the present study. Suicidal behaviour in the present study population is influenced by basic characteristics (tobacco/alcohol consumption behaviour). Dissatisfaction with academic performance was substantially connected with suicide behaviour among other fundamental characteristics variables, which is a finding that is exactly in line with findings from research conducted in India.[15,19] The current study looked into the strongest risk factor for such behavior—medical students who were unhappy with their academic performance—and found that they were more likely to engage in suicide behaviour than their peers. This outcome is consistent with research that shows academic performance dissatisfaction to be a strong risk factor (2–3 times higher risk) for suicide behaviour.[11,20] According to the results of the current study, depression was the second-strongest predictor of suicide conduct in medical students.

When compared to respondents without depression, individuals with depressive symptomatology (PHQ-9 score > 10) showed a greater odd chance of engaging in suicidal activity. In a Malaysian analytical cross-sectional study of 657 medical students, depression was found to be one of the most powerful predictors of suicide behaviour (5.9 times higher odd risk).[16] Dissatisfaction with academic performance is a direct result of poor academic performance, which causes exam anxiety and self-doubts about academic ability. As a result, students may experience feelings of worthlessness, hopelessness, and utility, which can lead to depression and may be the cause of the rising risk of suicidal behaviour in these students.[17]

This was an effort to evaluate any potential relationships between suicidal conduct and the elements of coping mechanisms in medical students. In the current study, it was found that medical students most frequently used psychological resilience as a coping mechanism, followed by religion and humour. Supportive strategy was also found to be a significant protective factor, whereas mental disengagement was found to be a significant risk factor for suicidal behaviour.

According to a qualitative study[21], the present study's evaluation of psychological resilience revealed a range of psychological characteristics (passive acceptance, active coping, and positive reframing) as potential contributors. Earlier studies among medical students have demonstrated that improving psychological resilience could reduce the impact of negative emotions and have favourable effects on psychological well-being because it is a dynamic process involving outcomes, attributes, or the process of coping with, adapting to, and recovering from stressful events.[22,23] In contrast to the findings of the present investigation, which found no significant association between suicidal conduct and psychological resilience, a recent study[24], identified psychological resilience as a substantial protective factor against the risk of suicidal behaviour. The little correlation between suicidal conduct and psychological resilience may be explained by medical students seeing the challenges as a challenge and solving them by diverting their attention to other activities by establishing a positive cognitive route. Contrary to predictions, it was discovered that a higher proportion of medical students who were not suicidal used religion and humour as a coping mechanism, even though these traits were not statistically associated with suicidal behaviour. It was observed that the Brief-COPE scale's item for "religion" also includes spirituality, and that the item for "humour" did not explicitly state whether the use of affiliative or self-defeating humour was involved, which may be the reason why these items were not considered protective factors against suicidal behaviour. In addition, Eskin et al[25] discovered that people who identified as spiritual but not religious could not have had the same protection against suicidal ideation. Only a few cross-sectional studies where humour and religiosity were assessed separately found this nonsignificant connection with suicidal conduct, similar to the current study.[11]

Interestingly, the current study found a substantial link between supportive techniques and a lower probability of suicide behaviour. This conclusion may have indicated that medical students developed coping mechanisms in the face of emotional distress and employed coping mechanisms as a way to avoid unpleasant emotions in order to reduce the probability of suicide ideation. The danger of suicide behaviour developing in high-risk cases was previously documented to be decreased by social and emotional support, according to the literature.[26] It was found that the sole coping strategy significantly linked to a higher risk of suicide conduct among medical students was mental detachment, which was the only one utilised by the suicidal group. According to our research, pupils who used mental disengagement techniques had a higher risk of engaging in suicide behaviour than those who did not. These findings demonstrated that students who are at a high risk of engaging in suicidal conduct may have poor problem-solving abilities and unfavourable attitudes toward stressful situations, and they symbolised mental disengagement as a bad coping mechanism. According to Tang et al[9] research in China, which supports the findings of the current study, students who are at a higher risk of attempting suicide rely more heavily on maladaptive coping mechanisms when they experience chronic stress and persistent exposure to stressful situations. What is known is consistent with the study's findings: maladaptive coping mechanisms are ineffective, decrease students' mental health, and also predict suicidal conduct.[11,27]

The primary advantage of the current study is that it is, as far as we are aware, the first to evaluate the predictive effects and makes it easier to comprehend how various coping mechanisms affect the likelihood of suicide conduct in medical students. Second, the study used standardised validated measures with excellent internal reliability to identify the vulnerable categories of medical students. Thus, the findings were noteworthy and had therapeutic ramifications that could effectively stop suicidal conduct in medical students.

The current study also contains a number of shortcomings. First of all, because this study was cross-sectional, it was not possible to investigate the causal relationships between outcomes and the long-term effects of stressful situations on suicidal behaviour. Second, this study excluded psychiatric conditions that have been linked to suicide conduct, such as worry or stress, in addition to depression. This study excluded other factors that might have influenced suicide behaviour, such as stressful college-related events, substance dependence on drugs other than tobacco and alcohol, therapy received, and prior/family history of psychiatric illness or suicidality. Third, the possibility of information, selection, recollection, and answer bias in the current study is not completely excluded due to the use of self-administered questionnaires. One of the primary limitations is that each academic year's prevalence and risk factors for suicidal behaviour were not examined individually.

Conclusion

This study came to the conclusion that a significant number of medical students had suicidal conduct. It offers empirical proof that supportive strategies work to prevent suicide conduct whereas depression, smoking, drinking, and academic performance dissatisfaction in students—along with the use of mental disengagement as a coping mechanism—are risk factors. The message is that medical institutions should make a determined effort to identify depression and suicidal conduct in medical students early on and create plans to boost their mental health by setting up counselling sessions, seminars, and workshops at the institutional level. The systematic support that medical educators give their students can assist them deal with challenging circumstances that arise during medical school. To combat the academic pressure that might aid in producing healthy physicians, the government should strive to include stress coping techniques and wellness medical curriculum.

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