

# Depression and its correlates among undergraduate students in a medical college of West Bengal: A cross-sectional study



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## ABSTRACT

**Background:** Depression among medical students is still a neglected public health problem in India. **Aims and Objectives:** This study was conducted to find out the prevalence of depression and its correlates among undergraduate medical students of a medical college of eastern India. **Materials and Methods:** A cross-sectional descriptive study was conducted among 336 undergraduate students of a Medical College during October 2022–January 2023. A pre-designed, pre-tested, semi-structured, self-administered questionnaire incorporating Beck's depression inventory scale was used for data collection. Data were analyzed using the trial version of SPSS software version 20.0. Mean, standard deviation, proportion, or percentages were calculated. Chi-square and Fisher's exact test were used for statistical significance as necessary. For all statistical purposes,  $P < 0.05$  was considered statistically significant. **Results:** Out of the total of 336 students, 205 were male and 131 were female. The mean (SD) age of the study participants was  $21.04 \pm 1.75$  years. More than one-third (39.3%) of the study participants were suffering from depression. Bivariate analysis showed that there was a significant association between depression with certain variables such as gender, quality of relationship with friends, major catastrophic events in the past 3 months, broken relationship, and not opting for MBBS by their own choice. **Conclusion:** Regular screening for depression, identification of contributory factors of depression and implementing appropriate measures, and follow-up of the affected students are vital. Analytical studies aimed at identifying the risk factors and the effects of depression on the undergraduate medical students are need of the hour.

**Key words:** Depression; Medical students; Risk factors; Beck's depression inventory scale

## INTRODUCTION

With the advancement of medical science, problems of communicable diseases begin to decline and that has been replaced by new patterns of non-communicable and chronic diseases such as cancer, diabetes, hypertension, and mental illness. Depression is an emerging public health problem in different age groups throughout the world due to various reasons. Depression among medical students represents a neglected public health problem in India. Various studies have been conducted in Western countries as well as in other parts of the world.<sup>1-5</sup> Medical education can impose significant psychological stress on undergraduates. It is very

important to prevent the ill effects of depression on one's educational attainment and career through early detection and proper intervention. Early onset depression among medical students interferes with psychological, social, and academic functioning, placing him or her at greater risk for problems such as substance abuse and suicidal behavior.<sup>5</sup> Considerable degree of psychological morbidity has been reported among medical students ranging from stress, interpersonal problems, and suicidal ideation to psychiatric disorders.<sup>6-9</sup> Various factors like educational life, social factors such as alcohol use, drug addiction, family problems, family history of depression, and staying away from home were associated with depression among

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medical students.<sup>10</sup> Studies of such contributory factors can be a useful tool to take appropriate steps like counseling for depressed medical students. Hence, this study was carried out to find out the prevalence of depression and its correlates among undergraduate medical students of a medical college of eastern India.

### Aims and objectives

The objectives of this study were to estimate the prevalence of depression and to determine its correlates among undergraduate students of a Medical College in West Bengal.

## MATERIALS AND METHODS

An institution-based, cross-sectional descriptive study was conducted among the Undergraduate (UG) Medical students in Bankura Sammilani Medical College, West Bengal during October 2022–January 2023 to accomplish the stated objectives. The undergraduate students from all the four phases of MBBS were considered the study population. Among them, the students who were present on the days of data collection and gave their consent to participate in the study were included, whereas the students having illness were excluded from the study.

### Sample size and sampling technique

The sample size was calculated using the formula  $n = Z\alpha^2 pq / d^2$  (where  $n$  = sample size,  $Z\alpha$  = standard normal deviation at a desired confidence interval,  $p$  = anticipated prevalence of depression among the undergraduate medical students,  $q = 100 - p$ ,  $d$  = allowable error). Considering 95% confidence interval, the anticipated prevalence of depression among the undergraduate medical students as 54.0% (as reported by a previous study done by Kundu et al.,<sup>11</sup> in West Bengal) and 15% relative error in the calculated sample size was  $n = (1.96)^2 \times 0.54 \times 0.46 / (0.15 \times 0.54)^2 = 145.4 \approx 145$ .

As the stratified random sampling technique was adopted, so to get the precision of simple random sampling a design effect of two was considered and so the calculated sample size was multiplied by the design effect. Thus the corrected sample size was  $145 \times 02 = 290$ . Considering 15% anticipated non-response, the final minimum required sample size became  $= 290 + 43.5 = 333.5 \approx 334$ . Finally, 336 students were considered samples for data analysis. About 336 students were taken from all the four phases, each strata consisting of 84 students.

### Tools and technique

A predesigned, pretested, semi-structured, self-administered questionnaire incorporating Beck's depression inventory scale was used in this study. All the questions related to socio-demographic variables, exposure variables, and Beck's

depression inventory scale were explained in detail to the study participants to avoid any ambiguity, and emphasis was given on the completeness and accuracy of their answers. Adequate time was allotted for filling up the questionnaire.

Data were collected from the study participants by self-administered questionnaire and depression was assessed by Beck's depression inventory scale.<sup>12</sup> It is a 21-item self-reporting questionnaire for evaluating the severity of depression in normal and psychiatric population. Responses to the 21 items are made on a 4-point Likert scale, ranging from 0 to 3. Total scores can range from 0 to 63. More severe depressive symptoms were indicated by a higher total score. It was categorized in the following ways.

Total score	Level of depression
1–10	Normal
11–16	Mild mood disturbance
17–20	Borderline clinical depression
21–30	Moderate depression
31–40	Severe depression
Over 40	Extreme depression

### Study variables

#### Socio-demographic variables

Age, gender, socio-economic status (according to modified and updated B.G. prasad scale, June 2022), religion, caste, residence, distance from the native place, type of family, presence of siblings.

#### Exposure variables

The proportion of medical undergraduate students according to the professional year of MBBS, the proportion of medical undergraduate students having a poor relationship with parents and friends, proportion of medical undergraduate students according to smoking, alcohol abuse, and drug addiction, proportion of undergraduate medical students opted MBBS course by their own choice, proportion of undergraduate medical students had a history of a broken relationship, proportion of undergraduate medical students had any catastrophic event in the past 3 months, etc.

#### Outcome variable

The proportion of undergraduate medical students suffering from different levels of depression were the outcome variables.

### Operational definitions

#### Smoking

A single puff of smoking in the past 1 year was considered smoking.<sup>10</sup>

#### Alcoholism

Any study subject with an alcohol intake at least once in the past 12 months was considered an alcohol user.<sup>10</sup>

### Drug addiction

It can be defined as repeated use of any psychoactive substance, to the extent that the user is periodically or chronically intoxicated, shows a compulsion to take the preferred substance, and has great difficulty in voluntarily ceasing or modifying substance use.<sup>10</sup>

### Ethical considerations

The permission to conduct the study was sought from the Institutional Ethics Committee (IEC) of Bankura Sammilani Medical College. The ethical clearance number was No. BSMC/IEC/3339, dated September 29, 2022. The purpose of the study, advantages and disadvantages, anonymity, confidentiality, and voluntary participation was explained in details to all the study participants before data collection. After obtaining informed written consent data were collected and analyzed strictly maintaining the confidentiality.

### Data collection

Data were collected from the study participants after approval of the research proposal by the IEC. Using a stratified sampling technique from four phases of undergraduate medical students, 84 students were selected from each phase.

### Data analysis

After collection, data were entered in the Microsoft Office Excel sheet and it was checked twice to detect any erroneous entry. The trial version of the Statistical Package for the Social Sciences (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.) was used to analyze the data. Data were expressed in terms of mean, standard deviation, proportion or percentages and subsequently presented in the forms of tables and figures. Chi-square test and Fisher's Exact test were applied as necessary. For all statistical purposes,  $P < 0.05$  was considered statistically significant.

## RESULTS

A majority of the study participants (44.6%) were aged between 21 and 22 years. A maximum number of students were male, Hindu in religion, belonging to the general caste and were residing in urban areas. A majority of the study participants were belonging to nuclear families and had siblings in their families (Tables 1 and 2) showed that most of the study participants were having good relationships with their parents as well as friends, no broken relationships, and no family history of depression or any major catastrophic events in the past 3 months and were having no habit of smoking, alcoholism or drug addiction.

**Table 1: Distribution of study participants according to socio-demographic factors (n=336)**

Variable	Category	Frequency	Percentage
Age (years)	17–18	29	8.6
	19–20	93	27.7
	21–22	150	44.6
	23–24	59	17.6
	>24	5	1.7
Gender	Male	205	61.0
	Female	131	39.0
Caste	General	191	56.8
	Scheduled caste	77	22.9
	Scheduled tribe	17	5.1
Religion	Hinduism	294	87.5
	Islam	37	11.0
	Others	5	1.5
Residence	Rural	133	39.6
	Urban	203	60.4
Socioeconomic status	Lower/lower middle	47	14.0
	Middle or above	289	86.0
Distance from Native place	<100 km	138	41.1
	100–300 km	142	42.3
Type of Family	>300 km	56	15.6
	Nuclear	281	83.6
Presence of Siblings	Joint	55	16.4
	Yes	214	63.7
Total	No	122	36.3
		336	100.0

**Table 2: Distribution of study participants according to factors influencing depression (n=336)**

Variable	Category	Frequency	Percentage
Relationship with parents	Good	331	98.5
	Poor	5	1.5
Relationship with friends	Good	313	93.2
	Poor	23	6.8
Family history of depression	Yes	20	5.9
	No	316	94.1
History of major catastrophic events in the past 3 months	Yes	24	7.1
	No	312	92.9
Habit of smoking	Yes	18	5.4
	No	318	94.6
Habit of Alcoholism	Yes	19	5.7
	No	317	94.3
Habit of drug addiction	Yes	4	1.2
	No	332	98.8
Opting for MBBS by his own choice	Yes	306	91.1
	No	30	8.9
Any broken relationship	Yes	73	21.7
	No	263	78.3
Total		336	100.0

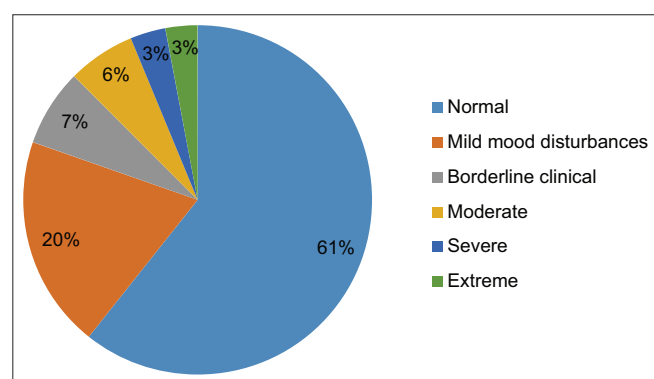
Figure 1 revealed that 132 of 336, i.e., 39.3% of study participants were having depression of whom the majority (19.6%) were suffering from mild mood disturbances whereas only 3% were suffering from extreme depression.

Table 3 showed that among the socio-demographic factors only the gender of the study participants were significantly associated with depression among them.

Among the psychosocial factors; quality of relationship with friends, history of major catastrophic events in the past 3 months, presence of any broken relationship, not opting for MBBS by own choice, etc. were the significant factors associated with the presence of depression among the study participants (Table 4).

## DISCUSSION

In the present study, 39.3% of students were found to be suffering from depression which is similar to the finding of a meta-analysis conducted by Dwivedi et al.,<sup>13</sup> regarding



**Figure 1:** Distribution of study participants according to the level of depression (n=336)

“depression among medical students of India” where pooled prevalence of depression was 39%. In various literature prevalence of depression among medical students were ranging between 8.5% and 71%. Arun et al.,<sup>14</sup> in their study from a medical college in south India, found that 14% of medical students were suffering from depression, whereas according to a study done in a medical college of New Delhi by Sidana et al.,<sup>15</sup> 21.5% of students suffered from depressive disorders and 7.6% of students had major depressive disorders. Coming to the eastern part of India, studies from medical colleges in West Bengal report the prevalence among medical undergraduates as 53.99%, according to a study done in Burdwan Medical College by Kundu et al.,<sup>11</sup> These variations may well be explained by the diversity of the instruments used to measure the depression among medical students. The study done by Kundu et al., also found that 12.69% of study participants were suffering from severe depression, which is a bit more than that found in the present study as 3.3%. They also found that 8.92% of the students were extremely depressed, which is also higher than that found in the present study, where 3% of medical undergraduates were extremely depressed. This variation may be accounted for the geographical diversity as well as instrumental differences to measure depression. In the present study majority of the study participants (44.6%) were aged between 21 and 22 years. A maximum number of students were male, Hindu in religion, belonging to the general caste and were residing in urban areas. A majority of the study participants were belonging to nuclear families and had siblings in their families. Similar socio-demographic findings were seen across various

**Table 3: Association between depression and sociodemographic factors (n=336)**

Variable	Category	Depression present number (%)	Depression absent number (%)	Total	Chi-square value, df, P-value
Gender	Male	65 (31.7)	140 (68.3)	205 (100.0)	12.661 1 0.001
	Female	67 (51.1)	64 (48.9)	131 (100.0)	
Religion	Hinduism	114 (38.7)	180 (61.3)	294 (100.0)	0.956 2 0.579
	Islamic	15 (40.5)	22 (59.5)	37 (100.0)	
	Others	3 (60)	2 (40)	5 (100.0)	
Residence	Rural	45 (33.8)	88 (66.2)	133 (100.0)	2.742 1 0.098
	Urban	87 (42.9)	116 (57.1)	203 (100.0)	
Distance from native place	<100 km	56 (40.6)	82 (59.4)	138 (100.0)	0.19 2 0.909
	100–300 km	55 (38.7)	87 (61.3)	142 (100.0)	
	>300 km	21 (37.5)	35 (62.5)	56 (100.0)	
Socio-economic status	Lower/Lower Middle	19 (40.4)	28 (59.6)	47 (100.0)	0.03 1 0.863
	Middle or above	113 (39.1)	176 (60.9)	289 (100.0)	
Type of family	Nuclear	109 (38.8)	172 (61.2)	281 (100.0)	0.177 1 0.674
	Joint	23 (41.8)	32 (58.2)	55 (100.0)	
Siblings present	Yes	84 (39.3)	130 (60.7)	214 (100.0)	0.000 1 0.987
	No	48 (39.3)	74 (60.7)	122 (100.0)	

**Table 4: Association between depression and psychosocial factors (n=336)**

Variable	Category	Depression present number (%)	Depression absent number (%)	Total	Chi-square value, df, P-value
Quality of relationship with parents	Good	130 (39.3)	201 (60.7)	331 (100.0)	0.001 1
	Poor	2 (40.0)	3 (60.0)	5 (100.0)	0.652 1
Quality of relationship with friends	Good	115 (36.7)	198 (63.3)	313 (100.0)	12.412 1
	Average/ Poor	17 (73.9)	6 (26.7)	23 (100.0)	<0.001
Family history of depression	Present	12 (60.0)	8 (40.0)	20 (100.0)	3.826 1
	Absent	120 (38.0)	196 (62.0)	316 (100.0)	0.05
History of major catastrophic events in the past 3 months	Present	16 (66.7)	8 (33.3)	24 (100.0)	8,124 1
	Absent	116 (37.1)	196 (62.9)	312 (100.0)	0.004
Any broken relationship	Yes	44 (60.3)	29 (39.7)	73 (100.0)	17.224 1
	No	88 (33.5)	175 (66.5)	263 (100.0)	<0.001
Smoking	Present	11 (61.1)	7 (38.9)	18 (100.0)	3.798 1
	Absent	121 (38.1)	197 (61.9)	318 (100.0)	0.051
Alcohol intake	Present	11 (57.9)	8 (42.1)	19 (100.0)	2.924 1
	Absent	121 (38.2)	196 (61.8)	317 (100.0)	0.087
Opting for MBBS by own choice	Yes	108 (35.3)	198 (64.7)	306 (100.0)	22.893 1
	No	24 (80.0)	6 (20.0)	30 (100.0)	<0.001

studies across the country. In our study, most of the study participants were having good relationships with parents as well as friends, no broken relationships, no family history of depression or any major catastrophic events in the past 3 months and were having no habit of smoking, alcoholism, or drug addiction. Besides, gender, quality of relationship with friends, history of major catastrophic events in the past 3 months, presence of any broken relationship, opting for MBBS by own choice, etc. were the significant factors associated with the presence of depression among the study participants. Comparing different studies across this part of our country similar findings were noticed. A similar finding was noticed in a study of Jhansi, Uttar Pradesh by Yadav et al.,<sup>16</sup> where family problems were significantly associated with depression among undergraduate medical students. In their study, they also found family history of depression and substance abuse as the significant factors of depression. In our study, both of these factors (P-value of both these factors were just equal to 0.05) were analyzed though not proved to be significant. In another study of South Rajasthan conducted by Kukreja et al.,<sup>17</sup> a family history of depression was not proved to be significantly associated. In their study, they found gender as significantly associated with depression among medical undergraduates, whereas no significant association was found between depression and residence, socioeconomic status, etc., resembling the findings of the present study.

#### Limitations of the study

1. This study was conducted in a single institution
2. There was a chance of conscious falsification from the study participants.

#### CONCLUSION

A substantial proportion of the study participants had depression and a significant association was found with multiple variables. Findings from these results will help formulate policies for increasing awareness among medical students, teaching faculties, and administrators about this neglected health issue which has been alarming these days. This study may also influence more researchers to take this pertinent topic into their consideration for studying it on large scale in a well-designed analytical and longitudinal study with the implementation of effective preventive and counseling strategies for the students. These strategies might help medical students to lead a stress-free life, which can actually increase the work efficiency and output improving their quality of life.

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**Authors' Contributions:**

**AG and SSM**- Concept and design of the study, prepared the first draft of the manuscript; **AG, SSM, and DS**- Reviewed the literature, and manuscript preparation; **AG, SSM, and SC**- Concept, coordination, statistical analysis, and interpretation, interpreted the results; **DS and SC**- Revision of the manuscript.

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