

## A Study of Depression and its Associated Factors in Medical Students

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### Original Research Article

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#### Article History

Received: 02.12.2017

Accepted: 08.12.2017

Published: 30.12.2017

#### DOI:

10.36347/sjams.2017.v05i12.020



**Abstract:** Medical students are a valuable human source for our future and depression in them leads to less productivity, reduced quality of life, learning difficulties and may negatively affect patient care, placing him or her at greater risk for problems such as substance abuse and suicidal behavior. To estimate the prevalence of depression and its associated factors among medical students. All the students from 1<sup>st</sup> year to 4<sup>th</sup> year were approached to participate in the study and were assessed using Beck Depression Inventory Scale. Association between depression and gender, year of study, medium of instruction in school and social factors like cigarette smoking, alcohol use, family problems, family history of depression, staying away of home, physical activity, existence of social support, conflict between career life with private life and work place phobia were analyzed by chi square and Odds Ratio with 95% confidence intervals as applicable. More than half 192 (61.14%) of the students had symptoms of depression. 63(53.85%) of total females and 129(65.49%) of total males reported symptoms suggestive of depression. According to the cut off scores, 122 students (38.8%) scored as normal (0-10), 57 students (18.15%) showed mild mood disturbance (11-16), (25.5%) as mild (17-20), 31 (9.87%) as moderate (21-30), 18 (5.73%) as severe (31-40), and 6 (1.93%) as very severe (>40) depression. The association between the grade of depression and sex was statistically significant ( $\chi^2 = 10.34$ ,  $P < 0.035$ ). The prevalence of depression was found highest in 4<sup>th</sup> year 62(82.4%). Prevalence of the depression is considerable amongst the medical students. Remedial measures should be undertaken to address this important issue.

**Keywords:** Depression, Medical students, Prevalence, Beck Depression Inventory Scale.

## INTRODUCTION

Depression is defined by World Health Organization as “Depression is a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration” [1]. It is an illness that can be long-lasting or recurrent affects both the mind and the body and is a leading cause of disability, workplace absenteeism, decreased productivity and high suicide rates [2, 3]. When mild, people can be treated without medicines but when depression is moderate or severe they may need medication and professional talking treatments [1].

Depression among medical students represents a neglected public health problem in India [4]. Studies have already reported that depression is the most common mental disease affecting them [1-4]. It is

estimated that by the year 2020 if current trends for demographic and epidemiological transition continue, the burden of depression will increase to 5.7% of the total burden of disease and it would be the second leading cause of disability-adjusted life years (DALYs), second only to ischemic heart disease [5]. There are considerable evidences that rates of depression and suicide are higher in medical students and these rates continue to remain elevated when these students become physicians [6].

The high rate of depression among medical students is associated with numerous factors which include their educational life, conflict between career life with private life, work place with phobia, loss of social support, social factors like alcohol use, drug addiction, family problems, family history of depression and staying away from home [1].

The Beck Depression Inventory Scale (BDI) has been used for screening of depression among the study population as it has been one of the most widely used screening instruments for detecting symptoms of depression [4]. Clearly, depression in medical students is of paramount importance and warrants serious study. The purpose of this study is to determine prevalence of depression and their associated factors among medical students.

**MATERIALS AND METHODS**

This cross-sectional study was conducted among the medical students of Government Medical College in West Bengal state of India. Only those who gave consent were provided with the questionnaire and asked to fill it by themselves. All the students from the 1<sup>st</sup> year to 4<sup>th</sup> year were included in the study. No specific sampling in the selected section of each year was done. All the students of each year were approached to participate in the study.

**Tool for data collection**

The study adopted the Beck Depression Inventory Scale (BDI) for screening of depression among study population which was already tested and validated. This is a subjective scale and used for screening purpose, which has to be further evaluated to confirm diagnosis [3]. We used this scale to screen depression based on self-report. It is a 21-item measure and has been one of the most widely used screening instruments for detecting symptoms of depression. It can be administered to assess normal adults, adolescents, and individuals with psychiatric disorders (13 years of age or older). It was designed to document a variety of depressive symptoms the individual experience over the preceding week. Responses to the

21 items are made on a 4 point scale, ranging from 0 to 3 (total scores can range from 0 to 63). A persistent score of 10 or above was taken as cut-off value. A self-administered questionnaire was utilized including study variables like age, information regarding class, social factors like cigarette smoking, alcohol use, family problems, family history of depression, staying away of home, physical activity, existence of social support, conflict between career life with private life and work place phobia.

**STATISTICAL ANALYSIS**

The consistent responses only were considered for analysis. All the responses were checked for the inconsistencies and if any, were not analyzed. Mean, standard deviation, percentages, proportions was used for descriptive statistics. Chi square test and Odds Ratio with 95% confidence intervals were used for inferential statistics.

**Ethical considerations**

The study was conducted according to the Declaration of Helsinki; the protocol was reviewed and approved by the independent ethics committee. Written informed consent was obtained.

**RESULTS**

The total number of students in the Medical College was 374, out of which (mention figure), giving a response rate of 90.90%. Out of the total questionnaires from these participating students - 26 were rejected for inconsistent/ incomplete responses. The final analysis was done with 314 undergraduate medical students studying in 1<sup>st</sup> year to 4<sup>th</sup> year of Burdwan Medical College. The average age of the participants was 21.2 Years (SD- 4.6).

**Table-1: Socio Demographic characteristics of study populations (n=314)**

Socio-Demographic Characteristics	Number of students (%)
Age	
17-23 years	289 (92.04)
24-30 years	25 (7.96)
Gender	
Male	197 (62.74)
Female	117 (37.26)
Religion	
Hindu	275 (87.59)
Muslim	30 (9.55)
Christian	8 (2.55)
Others	1 (0.31)
Year of study	
1 <sup>st</sup> year	73 (23.26)
2 <sup>nd</sup> year	79 (25.16)
3 <sup>rd</sup> year	85 (27.07)
4 <sup>th</sup> year	77 (24.51)

Among the participants 196(62.74%) were males and 117(37.26%) were females. Most of them 275(87%) were belong to Hindu religion and 30(9.55%) were of Muslim religion. On an average 78 students

from each year were participated in the study. 294(93.6%) of students were belong to Upper socio economic class according to modified BG Prasad’s classification. There was higher percentage of students

171(54.4%) studied their HSC in English Medium compared with 130(41.4%) of Bengali medium and 13(4.1%) of Hindi medium.

**Table-2: Grades of depression according to sex**

Grades of depression (score)	Male (Percentage)	Female (Percentage)	Total (Percentage)
Normal (1-10)	68 (34.51)	54 (46.15)	122 (38.85)
Mild mood disturbance (11-16)	32 (16.24)	25 (21.36)	57 (18.15)
Borderline clinical depression (17-20)	60 (30.45)	20 (17.09)	80 (25.47)
Moderate depression (21-30)	19 (9.64)	12 (10.25)	31 (9.87)
Severe depression (31-40)	14 (7.11)	4 (3.41)	18 (5.73)
Extreme depression (over 40)	4 (2.05)	2 (1.74)	6 (1.93)
Total	197	117	314

$\chi^2 = 10.34, P=0.03$

More than half 192 (61.14%) of the students had symptoms of depression. 63(53.85%) of total females and 129(65.49%) of total males reported symptoms suggestive of depression. According to the cut off scores, 122 students (38.8%) scored as normal (0-10), 57 students (18.15%) showed mild mood

disturbance (11-16), (25.5%) as mild (17-20), 31 (9.87%) as moderate (21-30), 18 (5.73%) as severe (31-40), and 6 (1.93%) as very severe (>40) depression. The association between the grade of depression and sex was statistically significant ( $\chi^2 = 10.34, P<0.035$ ).

**Table-3: Grades of depression according to year of study**

Grades of depression (score)	1 <sup>st</sup> year (Percentage)	2 <sup>nd</sup> year (Percentage)	3 <sup>rd</sup> year (Percentage)	4 <sup>th</sup> year (Percentage)	Total (Percentage)
Normal (1-10)	47 (64.38)	35 (44.30)	28 (32.94)	12 (15.58)	122 (38.85)
Mild mood disturbance (11-16)	15 (20.54)	17 (21.51)	17 (20.0)	8 (10.39)	57 (18.15)
Borderline clinical depression (17-20)	9 (12.32)	18 (22.78)	23 (27.05)	30 (39.01)	80 (25.47)
Moderate depression (21-30)	2 (2.76)	7 (8.86)	9 (10.59)	13 (16.88)	31 (9.87)
Severe depression (31-40)	0 (0.0)	2 (2.55)	6 (7.05)	10 (13.01)	18 (5.73)
Extreme depression (over 40)	0 (0.0)	0 (0.0)	2 (2.37)	4 (5.13)	6 (1.93)
Total	73	79	85	77	314

$(\chi^2 = 66.52, P<0.001)$

The prevalence of depression was found highest in 4<sup>th</sup> year 62(82.4%). The prevalence of depression was 57(67%), 44(55.7%) and 26(35.62%) in 3<sup>rd</sup> year, 2<sup>nd</sup> year and 1<sup>st</sup> year respectively. During the 1<sup>st</sup> and 2<sup>nd</sup> year, totally 5.9% of the medical students were classified to have moderate grade of depression. Among the students of the 3<sup>rd</sup> and 4<sup>th</sup> year, the prevalence of moderate depression was found to be 10% and 16%.

Similarly, degree of severe and very severe depression increased from 2% during 2<sup>nd</sup> year to 10% during the 4<sup>th</sup> year of the study. There was not a single student showed symptoms of severe depression in first year. The difference found between the grade of depression and year of studying was statistically significant ( $\chi^2 = 66.52, P<0.001$ ).

**Table-4: Prevalence of depression according to associated factors**

Determinants	Number of students	Number of students having depression	Prevalence (Percentage)	Odds Ratio	CI	Significance X <sup>2</sup> , p
Gender						
Male	197	129	65.49	1.626	1.019-	3.70,
Female	117	63	53.85		2.595	0.054
Year of study						
1 <sup>st</sup> year & 2 <sup>nd</sup> year	152	70	46.05	0.280	0.173-	27.03,
3 <sup>rd</sup> year and 4 <sup>th</sup> year	162	122	75.3		0.452	0.000
Medium of instruction in school						
English	171	105	66	1.024	0.649-	0.00
Vernacular	143	87	56		1.625	0.98
Tobacco use						
Present	111	94	84.68	21.848	11.754-	119.14,
Absent	203	41	20.19		40.609	0.000
Alcohol use						
Present	98	78	79.60	10.879	6.110-	75.70,
Absent	216	57	26.39		19.371	0.000
Drug addiction						
Present	48	45	93.75	29.333	8.870-	57.139,
Absent	266	90	33.83		97.001	0.000
Family problems						
Present	96	87	90.63	33.340	15.648-	123.30,
Absent	218	49	22.48		71.034	0.000
Family history of depression						
Present	113	79	69.92	6.016	3.625-	50.49,
Absent	201	56	27.86		9.986	0.000
Staying in hostel						
Yes	228	115	50.43	3.358	1.911-	17.73,
No	86	20	23.25		5.901	0.000
Physical activity						
Present	168	66	39.28	0.722	0.461-	1.715,
Absent	146	69	47.26		1.131	0.1
Existence of social support						
Present	220	81	36.82	0.432	0.264-	10.609,
Absent	94	54	57.44		0.706	0.001
Existence of financial support						
Present	253	90	35.57	0.072	0.031-	53.39,
Absent	61	54	88.52		0.164	0.000
Conflict between career life and private life						
Present	91	55	60.44	2.731	1.654-	14.93,
Absent	223	80	35.87		4.509	0.000
Workplace phobia						
Present	86	59	68.60	3.608	2.127-	22.740,
Absent	228	86	37.71		6.120	0.000

As per Table 4, the OR and 95% CI of factors associated with depression among medical students. Depression was significantly higher in 3<sup>rd</sup> year and 4<sup>th</sup> year students, as compared to 1<sup>st</sup> and 2<sup>nd</sup> year students ( $p < 0.05$ ).

Students with habit of alcohol were more likely to report symptoms suggestive of depression (OR=10.879; 95%CI 6.110-19.371). Similarly

depression was found significantly higher in tobacco and drug users. Male students were more likely to reported symptoms suggestive of depression as compared to their female counterparts (OR=1.62; 95%CI 1.01-2.59).

Students having family history of depression were 6 times more likely to be depressed (OR=6.01;

95%CI 3.62-9.98). Again students having family problems showed significantly higher depression. Similarly, students facing language problem in their MBBS course because English not being medium of teaching in 10+2 were more likely to report symptoms suggestive of depression.

On the other hand students who undertook regular physical exercise were only 0.7 times likely to suffer from depression. Students having strong financial and social support were less likely to suffer from depression. Depression was significantly higher in students of facing problems like conflict between private life (OR-2.73; CI-1.65-4.50) and professional life and problem of work place phobia (OR-3.6; CI-2.12-6.12).

## DISCUSSION

In the current study, the BDI has been utilized to detect the prevalence of depression among medical students. Although it is not designed for diagnostic purposes, its epidemiologic utility has been evaluated in several studies, which concluded that it is a reliable and valid instrument for detecting depressive disorders in non-clinical populations. Several studies support the BDI's usefulness in measuring and predicting depression in medical and adolescent student's samples.

Consistent with the economic changes in the country, medical student population is increasing every year. In this competitive era, this has enhanced the risk of developing various mental disorders like depression. Well-documented studies to determine the prevalence of depression and its associated factors among medical students are few at global level [4, 7-9].

Prevalence rate of depression in various studies of India and other developing countries are estimated to range from 25% to 72% [4, 7-13]. The boundary between depressive disorder and the human distress is a gray zone. As the diagnosis of depression is made by self-rating scale and not by clinical examination, there is chance that prevalence of 61.14% is inflated data. But Singh A study of Private medical college in Bareilly found 49.1% of overall prevalence of depression; similarly students of Gupta and Basak study showed 45.3% students suffer from depression. Kumar *et al* study reported higher prevalence of depression as 71.25%. Other developing countries like Pakistan, Nepal and China reported that medical students suffered from depression are 35.1%, 29.7% and 50% respectively [4, 7, 9-11]. This difference in prevalence of depression is may be due to different characteristics of each medical college and its students and teachers. This may also be due to different instrument used in the study. We assured students about anonymity and encouraged them to give honest responses which may explain differences in results.

Contrary to the early belief, it has now established beyond doubt that adolescents and young adults can become victim of depression [10]. And this can be confirmed by looking on the findings. The grades of depression in present study are 43.65% of mild, 9.87% of moderate and 5.73% of severe depression. Singh A study of Private medical college in Bareilly found 64.8% of mild, 27.8% of moderate and 7.4% of severe depression and Gupta and Basak study showed 80% of mild & moderate and 7.5% of severe depression. A study on undergraduate Chinese medical students found nearly half of them are depressed with 2% having severe depression which is lower than our findings [9].

As the class of studying increases, the prevalence increased significantly. The prevalence of depression is less among 1<sup>st</sup> and 2<sup>nd</sup> year medical students (35.6% and 55.7% respectively) which is similar with Kumar *et al* and some other studies [4, 14-15]. The reason for this is more academic stress and hectic life style. In contrast to this, some studies showed that prevalence is significantly higher among 1<sup>st</sup> and 2<sup>nd</sup> year medical students [7, 12-13]. The reason might be that stress associated with a new study environment, greater degree of work load with obligations to succeed and homesickness.

Another finding of our study is that a gender difference regarding the association with depression is noted where female students reported a higher prevalence of depression than in male. Other similar studies also report depression to be more in female students [4, 7, 12-13].

In the present study, students indulging in substance abuse like alcohol, tobacco and drug addiction are 10 times more likely to report symptoms suggestive of depression compared to students who do not use substance abuse. Singh A study reported similar findings [7]. But, Kumar *et al.* is seen that alcohol use and drug addiction do not affect the prevalence of depression [4]. Substance abuse in medical students concurrent with depression is a matter of grave concern and preventive education and counseling programs in medical curriculum are needed.

Some of the studies found different risk factors such as language problem, family history of depression and family problems responsible for depression [4, 7]. Present study shows that the percentage of students facing language problems in their MBBS course because English is not being medium of teaching in 10+2 is slightly more and there is no significant difference. Supe AN study supported the same findings [14]. According to Singh A study, students facing language problems are 1.61times more likely to suffer from depression [4].

It has been demonstrated that mood disorders occur more commonly among the relatives of depressed persons than in general population [7]. We observed that the prevalence of depression is high among those medical students with family problems and it is found to be significant ( $\chi^2 = 123.30$ ,  $p = 0.00$ ). Similarly, those with family history of depression are 6 times more likely to suffer from depression. Kumar *et al.* reported same findings. Whereas study conducted in Pakistan, only 9 students are found to have a positive drug history and family history [13]. Students those are staying away from home are 3 times more at risk to develop depression. Other studies from India and Pakistan did not found any significant difference regarding students staying in hostel [7, 13-14].

Previous research has shown that leisure activities including physical exercise reduce stress and depression in students [4, 14]. Students of our medical college are 0.7 times likely to suffer from depression. Students should be encouraged to do regular physical exercise and to participate in sports and extracurricular activity. Students those are having social support of dear one in needful time and also have strong financial support are less prone to depression. Supe A did not any difference regarding social support of parents and dear ones [15].

There is an interesting finding in this survey which very few studies are reported earlier. There is a significant difference in students facing problems like conflict between career and private life and work place phobia compare with those not have the same problems. All the subjects are counseled and a psychologist and counselor took group sessions for the participants after the study. The students scoring more than 10 are suggested to consult a psychiatrist for further analysis and counseling.

As there are many more factors are responsible for depression like personality characteristics, academic curriculum satisfaction, physical infrastructure of institution (library, distance of hospital from medical college, canteen and hostel & its environment) and emotional comfort of student (love affairs, jealousy and parental support). These some of the important problems are not addressed in the present study.

## CONCLUSION

This study gives an idea of magnitude of depression among medical students and some of its associated factors. Depression is significantly associated with male gender, substance abuse, family problems, family history of depression, students staying in hostel, conflict between carrier and private life and lastly with work place phobia. Depression may be a significant hidden problem in Indian medical students. 5% and 2% of severe and extreme depression needs

mechanisms to identify and help students with mental health problems. Preparing medical students for life as doctors require more than acquisition of knowledge and skills.

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