

A study of co-relation of depression to various personality traits among medical students in a metropolitan city

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Abstract

Background: Medical students are exposed to multiple factors during their academic and clinical study that has been shown to contribute to high level of depression. Specific personality traits have been found associated with depression. Hence, this study was taken up to find the prevalence of Depression among medical students and its correlation with their personality traits. **Methodology:** A questionnaire was given to the students and were asked to fill it, which included their sociodemographic details, their family and medical history, Various scales were used to find out if they have depression and also to find their personality traits. **Results:** Total of 435 students participated in the study. the mean age of 20.20 ± 1.87 years. A total of 20 % of the students showed having depression. Factors significantly associated with having depression were female, age group 21 – 24 years, staying in hostel, suffered from major illness in past one year and having any chronic disease. Personality traits having significant association were Neuroticism, Agreeableness, Conscientiousness, and Extraversion. **Conclusion:** There should be a screening for factors affecting mental health at the start of the curriculum, along with regular follow up and counselling to students, if required. **Keywords:** Depression, Personality Traits, Medical students.

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INTRODUCTION

University students face various stressors and medical students, face additional challenges such as pressures of clinical environment.¹ Academic stress among medical students is linked to reduced quality of life,^{2,3} musculoskeletal complaints,^{4,5} depression and anxiety.^{6,7,8} Meta-analysis showed that depression affects approximately one third of medical students,⁹ and it is likely that its overall prevalence is higher than the general

population.¹⁰ which can be related to impairment of their professional skills in the future. Individuals possess certain characteristics, which influences their behaviours in various situations – their personality traits.¹¹ Personality traits are good predictors of academic success during medical training.¹² Yet, it is suggested that specific personality predispositions may be vulnerable to stress^{13,14} and poorer mental health.^{15,16}

The current study thus tries to screen Depression among medical students and its correlation with specific personality.

Aim and Objectives: To study the socio-demographic determinants of MBBS students in a medical college. To find the patterns of depression among these students using a self-reported questionnaire. To assess specific Personality types as risk factor predisposing to Psychological Morbidity and Depression among Medical Students.

METHODOLOGY

A cross-sectional, questionnaire-based survey was carried out among the 1st to 9th Semester undergraduate MBBS students of a Medical College in a metropolitan city, during the time period August 2017 to August 2018. Total number of 485 MBBS students were present in the college during the study period. Those denying consent for the study and those not available at the time of filling the questionnaire were excluded from the study. Hence, a total of 435 MBBS students were included in the study. After obtaining approval from the Institutional Ethics Committee and written informed consent from the participants, a Structured questionnaire was given to all the medical students to assess their sociodemographic profile, their personal and family history along with their travel and medical history. Their dietary pattern, Physical activity, Alcohol and substance abuse history was also enquired into. Their Personality types was found out using the Big 5 Personality Scale, while Major Depression Inventory was used to find their Depression level. It was informed to all students that the completion of the questionnaire was voluntary. Anonymity and confidentiality was assured.

Assessment of Personality Traits: Personality refers to the patterns of thoughts, feelings and behaviors consistently exhibited by a person over time that strongly influence their expectations, self-perceptions, values and attitudes, and predicts their reactions to people, problems and stress.¹⁷ Research in human personality supports those five basic dimensions encompass most of the significant variation in human personality, which is included in the Big Five Personality Traits.¹⁸ Personality of the students in this study was analyzed using the Big 5 Personality scale.¹⁹ This scale has a total of 44 questions. Depending on how the student feels for each question, the students were asked to score them as 1,2,3,4,5 depending on if they Disagree Strongly, Disagree a little, Neither Agree nor Disagree, Agree a little, Agree Strongly respectively. The scoring for each type of the Five personality was as follows

Scoring: BFI scale scoring (“R” denotes reverse-scored items):

Extraversion: 1, 6R, 11, 16, 21R, 26, 31R, 36
 Agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R, 42
 Conscientiousness: 3, 8R, 13, 18R, 23R, 28, 33, 38, 43R
 Neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39
 Openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R, 44
 Total scores for each of the 5 personalities based on the above scoring were added up and their median found out. Based on this, 2 groups were formed in each category, those above the median and those below the median, and they were classified as follows for each of the 5 Personality traits.²⁰

Type of Personality	Above Median	Below Median
Extraversion	Extrovert	Introvert
Conscientiousness	Focused	Flexible
Agreeableness	Adapter	Challenger
Neuroticism:	Reactive	Resilient
Openness	Explorer	Preserver

The Five Major Personality Types²¹ included are:

Extraversion

Extroverts enjoy interacting with people, and are often perceived as full of energy. They tend to be enthusiastic, action-oriented individuals. Extraverted people may appear more dominant in social settings.

Introverts tend to seem quiet, low-key, deliberate, and less involved in the social world. They tend to be reserved, timid, and quiet.

Conscientiousness is the personality trait of being careful, or diligent. Conscientiousness implies a desire to do a task well, and to take obligations to others seriously.

Focused people tend to be efficient and organized. They exhibit a tendency to show self-discipline, act dutifully, and aim for achievement; they display planned rather than spontaneous behavior; and they are generally dependable.

Flexible: People who score low on conscientiousness tend to be laid back, less goal-oriented, and less driven by success; they also are more likely to engage in antisocial and criminal behavior.

Agreeableness: The agreeableness trait reflects individual differences in general concern for social harmony.

Adapter: Agreeable individuals value getting along with others. They are generally considerate, kind, generous, trusting and trustworthy, helpful, and willing to compromise their interests with others. Agreeable people also have an optimistic view of human nature.

Challenger: Disagreeable individuals place self-interest above getting along with others. They are generally unconcerned with others' well-being, and are less likely to extend themselves for other people. Low agreeableness personalities are often competitive or challenging people, which can be seen as argumentative or untrustworthy.

Neuroticism: Neuroticism is the tendency to experience negative emotions, such as anger, anxiety, or depression. It is sometimes called emotional instability,

Reactive: Those who score high in neuroticism are emotionally reactive and vulnerable to stress. They are more likely to interpret ordinary situations as threatening. They can perceive minor frustrations as hopelessly difficult.

Resilient: individuals who score low in neuroticism are less easily upset. They tend to be calm, emotionally stable, and free from persistent negative feelings.

Openness: Openness to experience is a general appreciation for art, emotion, adventure, unusual ideas, imagination, curiosity, and variety of experience.

Explorers are open to experience, intellectually curious, open to emotion, sensitive to beauty and willing to try new things, more creative and more aware of their feelings.

Preservers: seek to gain fulfillment through perseverance and are characterized as pragmatic and data-driven – sometimes even perceived to be dogmatic and closed-minded.

Assessment of Depression: Depression was assessed among the students using the Major Depression Inventory scale.²² This scale has 12 questions, Questions 8 and 10 has 2 sub question a and b. The students had to mark as to how they felt in the last month against each questions which were scored as 5,4,3,2,1 for All the time, Most of the time, More than half the time, Less than half the time, Some of the time, At no time respectively. Functionally, it only contains 10 questions, as only the highest score of either a or b are counted in both questions 8 and 10.

Using the MDI as measure of depression severity: total score of ten items calculated by adding together 10 scores. The total score range is 0-50.

0-20 indicates depression does not exist or its existence is doubtful,

21-25 indicates mild depression,

26-30 indicates moderate depression, and

31-50 indicates severe depression.

Statistical Analysis: Data was entered in Excel sheet. Tables were drawn, wherever necessary. Analysis of the data was done using SPSS package version 19. Frequency and percentages were found. Chi Square Test and Binary Logistic Regression was used for testing significance.

RESULTS

A total of 435 medical students were interviewed for this study. Table 1 shows the sociodemographic profile along with the Personal and Family details. As per the age distribution, it was seen that 52.18% (227) were in the age group of 17 – 20 years, with the mean age of 20.20 ± 1.87 years. Males were 52.65% (229). Distribution of the students as per their religion, revealed that 79.8 % (347) were Hindus, 12.4% (54) were Muslims, while 7.8% (34) were either Buddhist, Jain and Christians. When enquiring about their socioeconomic status, 49.3% (215) did not mention their Families' economic status, 45.2% (196) belonged to Upper and Upper Middle socioeconomic class. Enquiring about the details of the Family and Personal history, it was revealed that 19.3% (84) of the study participants had someone in their family from a medical background, while 21.6 % (94) had joined the MBBS curriculum due to Parental pressure/ wish. History of their stay showed that 50.2% (219) resided in hostel, while their travel details showed that 13.3% (58) travelled 21 km and more every day to reach medical college. In terms of time required to travel, 27.59% (120) of them needed more than

30 minutes to travel each day to reach college. Details about their personal characteristics revealed, that 31.72% (138) frequently spent time on physical activity, 23.68% (103) suffered from any major illness in the past one year, while 4.14% (18) of them had history of any chronic disease. It was observed that 11.72% (51) played video games during their leisure time, while 44.37% (193) of them watched television Tea (219), coffee (193) and soft drinks (91) were the most commonly consumed beverages. Only 37 students reported consuming alcohol, 11 students consumed pan masala, 4 students reported smoking tobacco, while 3 of them consumed drugs. However, this type of a questionnaire was inadequate and it is likely that the actual prevalence of alcoholism, tobacco or other drug usage was under- reported. Figure 1 shows the Major Depression Score Interpretation. It was observed that 20 % (87) students in this study were seen to be suffering from any form of depression. Using the Big 5 Inventory, Figure 2, shows the assessment of the Personality of the Study participants showed that 52.18% (227) were Extrovert, 51.72% (225) were Focused, 51.26% (223) showed Adapter characteristics, 49.42% (215) were Reactive and 54.48% (237) showed Preserver characteristics. For analysis of data, those having mild, moderate and severe depression were clubbed together to show Depression. In Table 2, as per the age group distribution, it was seen that 24.42% (51) of those in the age group 21 – 24 years showed having Depression, showing statistical significance. Among Females, 24.76% (51) were seen to be having depression, and this relation was statistically significant. Travelling time from college to hostel or home did not show any significance on having depression among the study population, where 18.33% (22) who travelled more than 30 minutes showed to have depression. Staying in the hostel was seen to be a significant factor in development of Depression, where 24.09% (53) who stayed at hostel were shown to have depression.

Among the study participants, those students who chose MBBS by choice, 20.53% (70) were seen to have depression. This difference is however not statistically significant. In the present study, those students having any medical background in their family, 30.49% (25) showed findings suggestive of depression. This changes were shown to have statistical significance. While enquiring about any major illness suffered by the student in the past one year, 32.04% (33) had depression, which was seen to be statistically significant. Statistical significance was seen between student's suffering from any chronic disease and depression ($p < 0.001$), where 52% (13) of those suffering from any chronic disease had depression. It was observed that, out of all the students who spent time on physical games frequently, only 18.12% (25) had depression. This was however not Statistically significant. Table 3 shows

the significance, between personality types (as per big five inventory score) and depression (as major depression score), Chi square was applied. Significance was seen in this study with Extraversion (0.013), Conscientiousness (0.003), Agreeableness (0.003) and Neuroticism (0.000). Based on binary regression, depression was correlated with various independent variables, it was found in Table No. 4, that those suffering from chronic illness, those who

suffered from major illness in past one year, those staying in hostel, female students and age group between 21 to 24 years were statistically significant predictors of depression. When correlated with various Personality Traits, significant co-relates was found with Personality characteristics of Neuroticism, Agreeableness, Conscientiousness and Extraversion.

Table 1: Sociodemographic Profile along with Personal and Family details of the MBBS Students.

Variables (n = 435)		Frequency(%)
Sociodemographic Profile		
Age group (in Years)	17 to 20	227 (52.18)
	21 to 24	208 (47.82)
Gender	Male	229 (52.65)
	Female	206 (47.35)
Socio Economic Status*	Lower upper and lower	17 (3.9)
	Middle and Middle Upper	7 (1.6)
	Upper and Upper Middle	196 (45.2)
Family and Personal details		
H/O of Doctor in Family or Occupation	Doctor	84 (19.3)
	Other	351 (80.7)
Reason for choosing MBBS	Interested	341 (78.4)
	Parent Wish	94 (21.6)
Staying in hostel	Yes	219 (50.2)
	No	215 (49.3)
Time needed to Reach college in minutes	< 30	315 (72.41)
	> 30	120 (27.59)
Suffered from Major illness in past 1 year	Yes	103 (23.68)
	No	332 (77.32)
Any Chronic Disease	Yes	18 (4.14)
	No	417 (95.86)
Time spend in physical Activity	Frequently	138 (31.72)
	Rarely	297 (68.28)

*215 (49.3%) of the students did not mention their socioeconomic status.

Table 2: Association of various factors with Major depression inventory

Factors	Depression	No depression	X ² (p value)
Age in Year	17 to 20 (n=227)	36 (15.86%)	191 (84.14%)
	21 to 24 (208)	51 (24.52%)	157 (75.48%)
Gender	Male (n= 229)	36 (15.72%)	193 (84.28%)
	Female(n=206)	51 (24.76%)	155 (75.24%)
Time needed to Reach college in min	< 30 (n=315)	65 (20.63%)	250(79.37%)
	> 30 (n= 120)	22(18.33%)	98 (81.67%)
Stays in Hostel	Yes (n=220)	53 (24.09%)	167 (75.91%)
	No(n=215)	34 (15.81%)	181 (84.19%)
Reason for choosing MBBS	Interested (n=341)	70 (20.53%)	271 (79.47%)
	Parent wish(n=94)	17 (18.09%)	77 (81.91%)
Family Medical Background	Yes (n= 82)	25 (30.49%)	57 (69.51%)
	No (n= 353)	62 (17.56%)	291 (82.44%)
Suffered from major illness in past 1 year	Yes (n= 103)	33 (32.04%)	70 (67.96%)
	No (n= 332)	54 (16.27%)	278 (83.73%)
Any Chronic disease	Yes (n= 25)	13 (52 %)	12 (48%)
	NO (n=410)	74 (18.05%)	336 (81.95%)
Time Spend - Physical Games	Frequently (n=138)	25 (18.12%)	113 (81.88%)
	Rarely (n= 297)	62 (20.88%)	235 (79.12%)

*Chi Square value

Table 3: Association of various Personality Types with Major Depression Inventory.

Big Five Inventory		Major Depression Inventory		X ² * (p value)
		Depression	No depression	
Extraversion	Extrovert	21 (9.64%)	206 (90.36%)	6.187(0.013)
	Introvert	36 (17.79%)	172 (82.21%)	
Conscientiousness	Focused	19 (9.3%)	206 (90.7%)	8.885(0.003)
	Flexible	38 (18.18%)	172 (81.82%)	
Agreeableness	Adaptor	19 (8.52%)	204 (91.48%)	8.442(0.003)
	Challenger	38 (18.78%)	174 (81.22%)	
Neuroticism	Reactive	46 (21.40%)	169 (78.60%)	25.67(0.000)
	Resilient	11 (5%)	209 (95%)	
Openness	Explorer	21 (10.60%)	177 (89.40%)	1.991(0.1583)
	Preserver	36 (15.96%)	201 (84.03%)	

Table 4: Binary logistic regression between Major depression inventory and set of independent (Predictors) variables and with various Personality Traits.

Predictor variables	B	S.E.	Wald	df	Sig.	Exp(B)
Gender(Female)	.524	.258	4.120	1	.042	1.688
Age (21 to 24)	.509	.259	3.866	1	.049	1.663
Whether stays in hostel(yes)	.555	.258	4.620	1	.032	1.742
Family Medical background (yes)	.521	.298	3.051	1	.081	1.683
Suffered from any major illness in past 1 year (yes)	.653	.281	5.387	1	.020	1.922
Any chronic disease (yes)	1.404	.533	6.956	1	.008	4.073
Constant	-2.588	.298	75.527	1	.000	.075
Personality Traits						
Extraversion	.565	.263	4.623	1	.032	1.759
Conscientiousness	.617	.267	5.359	1	.021	1.854
Agreeableness	.711	.265	7.202	1	.007	2.036
Neuroticism	1.163	.274	18.060	1	.000	3.200
Openness	.300	.263	1.300	1	.254	1.349
Constant	-3.273	.382	73.582	1	.000	.038

*Chi Square value

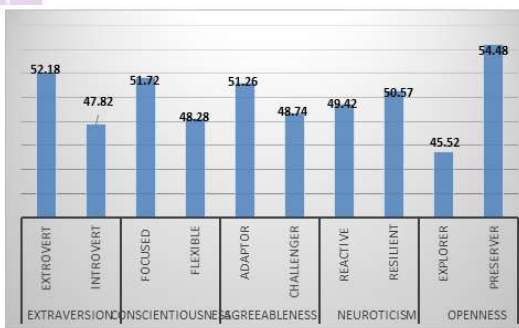
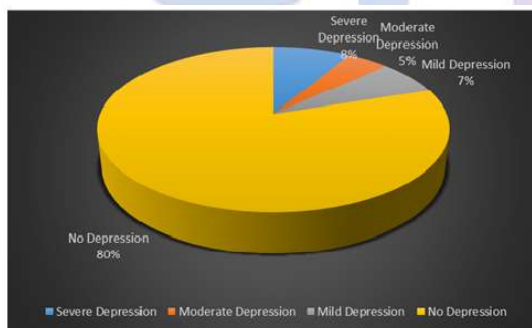


Figure 1: Major Depression Inventory Score Interpretation **Figure 2:** Distribution of Students according to their Personalities Traits.

DISCUSSION

A total of 435 medical students were interviewed for this study. As per the age distribution, it was seen that 52.18% were in the age group of 17 – 20 with the mean age of 20.20 ± 1.87 years, similar to a study done by Wafaa *et al.*²³ Males were 52.65%, which was similar to a study done by Chanrith Ngin *et al.*²⁴, while 79.8 % belonged to Hindu religion which reflects the social structure of the Indian society where Hindus are the most common religion. Similar results were seen by study done by Pokhrel²⁵ When enquiring about their socioeconomic status, 49.3% did not

mention their families’ economic status. This probably reflects the fear of stigma or an inferiority complex associated with lower socio-economic classes. Those who, belonged to Upper and Upper Middle socioeconomic class were 45.2%. Similar findings were seen in the study done by Wafaa *et al.*²³ The low percentage of students in the Upper Lower and Lower Socioeconomic class shows that very few students from the lower socioeconomic classes reach the doors of a medical college. Enquiring about the details of the Family and Personal history, it was revealed that 19.3% of the study participants had someone in their

family from a medical background, It can be presumed that those students who have a relative as a medical professional seem to get some idea about the nuances of medical profession and are thus relatively prepared in coping with the additional stress.

About 21.6 % had joined the MBBS curriculum due to Parental pressure/ wish. History of their stay showed that 50.2% resided in hostel, while their travel details showed that 13.3% travelled 21 km and more every day to reach medical college. These time requirements are mainly due to heavy traffic and overcrowded public transport system. Public transport systems are usually very crowded and can potentially cause physical as well as mental stress on the travelers. Details about their personal characteristics revealed, that 31.72% frequently spent time on physical activity, 23 % suffered from any major illness in the past one year, while 4.14% of them had history of any chronic disease. There were 21.6 % (94) students who clearly indicated that they did not seek admission into MBBS by themselves but were doing so on their parent's insistence. This showed that they had lack of decision-making power. Forced career choices can lead to burnout and depression in students. In a study done by Shabana Mohammad,²⁶ showed similar findings. This could be, as parents from medical background want their children to support them. As per the major depression inventory score, 20% (87) students in this study were seen to be suffering from depression. These findings were different from the findings in the study of Wafaa.²³

Sociodemographic factors with positive correlation with depression were females, these results are similar to study done by Wafaa,²³ and Stewart Ngasa²⁷ those staying in hostel, similar to study done by Liaqat *et al.*²⁸, those with medical family background, suffered from major illness in past 1 year and any chronic disease, as seen in study done by Stewart Ngasa.²⁷

Life of undergraduate medical students is faced with various stressors. In addition to this, those staying in the hostel have to cope with the new environment at the hostel, being away from home for the first time, which could make them more vulnerable to depression. Those suffering from any illness, including chronic diseases need to adjust to the illness, including its treatment, which could be stressful and could cause a certain amount of sadness and despair, making them further vulnerable to depression. Personality types, which was seen to be correlated with depression were and Neuroticism (0.000), Agreeableness (0.003), Conscientiousness (0.003) and Extraversion (0.013). Individuals with high levels of neuroticism, commonly experience negative emotions, such as anger, nervousness, depressive symptoms, and anxiety, which are characterized by impulsivity, and anxiety. Those with high levels of neuroticism are more prone to being depressed

because they experience more stressful events. Disagreeable people are more selfish and generally have negative view of others. Those individuals scoring high on conscientiousness, are highly competent, self-disciplined and aiming to achieve perfection. Those persons with lower levels of extraversion, tend to have social anxiety along with greater sensitivity for feelings and emotions. All these traits could make individuals more vulnerable to mental ill health. Study done by Saichampini Sailo²⁹ have shown correlation of depression with Neuroticism. Study done by Engin Deniz¹¹ have shown correlation with Extraversion, Agreeableness and Openness. In a similar study done by Adomas Bunevicius,¹⁴ correlation was seen with depression among medical students with Extraversion and Conscientiousness.

CONCLUSION

The present study was aimed at studying depression among medical students and its correlation with personality. The results show that majority of the study participants belonged to age group 17 – 20 years, were males, Hindu by religion, belonged to upper and Upper middle socio-economic class, resided in hostel, did not have any person in the family with medical background. A few of them had joined this field due to parental pressure. Some of them had suffered from major illness in the past year, while a few had some chronic disease.

In this study, 20% of the students were seen to be having depression. On checking for association of various sociodemographic characteristics, it was seen that factors such as females, being in age group 21 – 24 years, staying in hostel, having a family medical background, having suffered any major illness in the last one year and having a chronic disease was shown to have positive correlation with depression.

Personality traits seen to be associated with having depression were Neuroticism, Agreeableness, Conscientiousness, and Extraversion.

Recommendations:

1. A mechanism wherein all students are screened for physical and mental health at the very outset of medical education and then periodically thereafter should be established. Such regular health check-ups will also promote wellness in the students.
2. All the students, irrespective of the presence or absence of a psychological problem, should be periodically subjected to a professional counselling session wherein they get an opportunity to discuss their problems in privacy without the fear of negative academic or social repercussions. Subjecting all the students will also

prevent stigmatization of those who actually need such a service and will ensure compliance.

3. A buddy system can be introduced where each student's health and well-being is to be monitored by a batch-mate or a senior colleague. Alternatively, a senior faculty member can be appointed as the psychological and academic mentor of a group of students with whom the students can discuss their problems.
4. Regular exercise and sports schedule with periodic cultural and sports events with an emphasis on everyone's participation can also act as an ice-breaker and promote inter-personal relations.

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