ORIGINAL RESEARCH ARTICLE

A Study on Depression, Anxiety and Stress Among Medical Undergraduate Students of a Women's Medical College, South India

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ABSTRACT

Background: Mental health of a medical student remains affected throughout training due to long study and working hours, extensive course content, examinations, peer competition, uninspiring environments, sleep deprivation. Objectives of this study were to estimate the proportion of Depression, Anxiety and Stress among Women medical undergraduate students and to determine the association between the Depression, Anxiety, Stress and Socio demographic factors among Women medical undergraduate students.

Materials and methods: This were a cross sectional Study conducted among First, second, third and fourth year MBBS students of SVIMS - Sri Padmavathi Medical College for Women, Tirupati, Andhra Pradesh. Medical students who were present and willing to participate voluntarily on the day of data collection were included. Sample size calculated was 375. Information collected was socio-demographic details and Depression Anxiety Stress scale [DASS 42] was used to assess depression, anxiety and stress levels.

Results: The present study assessed Depression, Anxiety and Stress among 588 medical undergraduates, by DASS 42 scale which revealed prevalence of depression was 34.7%, anxiety 44% and stress 30.3% and their significance association with year of study, not satisfied/partially satisfied with own education, less consumption water, less sleeping hours and hours of usage of gadgets.

Conclusion: The present study found that prevalence of depression 34.7%, anxiety 44% and stress 30.3% among medical undergraduates. Medical students under strain are either unaware of their situation or reluctant to seek help.

Key words: Depression, anxiety, stress, women medical undergraduate students

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INTRODUCTION

Medical education is a full-time commitment and responsibility of students that entails academic tasks, activities, social conduct, support, and care provided to patients. Considerable degree of psychological morbidity has been reported among medical students ranging from stress, interpersonal problems and suicidal ideation to psychiatric disorders[1] and tend to have greater psychological distress than the general population[2]. Mental disorders are often been neglected because of its non-specificity in diagnosis, indefinite clinical presentations, long term and varied treatment, various myths and belief systems associated with social stigma. Depression is an illness that involves the body, mood, and thoughts. It affects the way a person eats and sleeps, the way one feels about oneself, and the way one thinks about things.[3] People with anxiety disorders usually have recurring intrusive thoughts or concerns. They may avoid certain situations out of worry. They may also have physical symptoms such as sweating, trembling, dizziness or a rapid heartbeat.[4] Stress is related to irritability, impatience, and difficulty in relaxing.[5] Stress may give rise to feelings of fear, incompetence, uselessness, anger, and guilt and has been associated with both psychological and physical disorders.[2] The coping strategies applied by students may determine the effect of stress on psychological and physical health and may determine whether stress has a positive or negative influence. Higher proportion of presence of these psychological domains among females might be due to over consciousness, peer or family pressure and fear of future prospect.[6] Various other socio demographic factors like year of study, staying in the hostel, parent's education, financial stress in the family and addictions of medical students are also associated with depression, anxiety and stress.

The present study was aimed to estimate the proportion and to determine the association of Sociodemographic variables with depression, anxiety and stress among women medical undergraduate students in a medical college.

METHODOLOGY

The present study was a cross sectional Study conducted among First, second, third and fourth year MBBS students of SVIMS-Sri Padmavathi Medical College for Women, Tirupati, Andhra Pradesh. Medical students who were present and willing to participate voluntarily on the day of data collection were included in the study. Medical students who were not willing to participate and absent on the day of data collection were excluded.

Prevalence of depression in medical students from previous studies ranged from 27 to 51.3%. Sample size is calculated based on the prevalence of depression from previous study done in India.[7] Sample size was calculated by using the formula: $4pq/d^2$ (p = 37.3/100=0.373, q = 1-p = 0.627, d = absolute precision of 5%). The calculated sample size was 375.

Information was collected using a semi structured questionnaire which contains two parts. **Part A:** Information regarding socio- demographic details like age, year of study, residence and also regarding addictions, academic performance was collected.

Part B: A pretested, validated, standardized, self-administered survey instrument, Depression Anxiety Stress scale [DASS 42][8,9] used to collect the data from the medical students. Concurrent validity of DASS 42 was 0.87 and Cronbach internal consistency of the entire scale was 0.89.[10]

DASS 42 was a pretested, validated, standardized, self-administered survey instrument, has 42 questions. Each question was scored on 4-point scale ranging from 0 to 3. 0-Did not apply to me at all, 1-Applied to me to some degree, or some of the time, 2-Applied to me to a considerable degree, or a good part of time, 3-Applied to me very much, or most of the time. Depression was graded based on scores as normal (0-9), mild (10-13), moderate (14-20), severe (21-27), extremely sever (28+). Anxiety was graded based on scores as normal (0-7), mild (8-9), moderate (10-14), severe (15-19), extremely sever (20+). Stress was graded based on scores as normal (0-14), mild (15-18), moderate (19-25), severe (26-33), extremely severe (34+).

Ethical considerations: The study was started after obtaining IEC approval from Institutional Ethics Committee, SVIMS, Tirupati. (IEC no- 1317). The study subjects explained the purpose of study and informed consent was taken before collecting the data.

The list of the students diagnosed with depression, anxiety or stress was given to the office of the student counselling centre of the medical college, where clinical psychologist was assessed the students and takes further action which includes relaxation techniques and referral to the psychiatry department for necessary treatment and follow-ups if required.

Data was entered in Microsoft excel sheet and analysed using IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp. Descriptive statistics like frequencies, percentages for nominal data and mean ± standard deviation for continuous data were calculated. Chi-square test was used to know the significance between categorical variables. Variables with p value less than 0.05 were included in the multivariate logistic regression analysis to identify the predictors of depression, anxiety and stress among the medical undergraduate students. A p value of less than 0.05 was considered as significance level.

RESULTS

Among 588 medical undergraduates, prevalence of depression was 34.7% (204), anxiety 44% (259) and stress 30.3% (178).

Table 1: Distribution of socio demographic factors of the study participants (N=588)

Variable	Participants (%)
Age group	
≤20 years	286 (48.6)
>20 years	302 (51.4)
Year of study	
1st MBBS	155 (26.4)
2nd MBBS	150 (25.5)
3rd MBBS	152 (25.9)
4th MBBS	131 (22.3)
State of origin	
Andhra Pradesh	502 (85.4)
Other states	82 (13.9)
NRI	4 (0.7)
Religion	
Hindu	534 (90.8)
Muslim	38 (6.5)
Christian	16 (2.7)
Residential background	
Rural	117 (19.9)
Town	291 (49.5)
City	178 (30.3)
Tribal	2 (0.3)
Staying in hostel	
Yes	467 (79.4)
No	121 (20.6)
Parents	
Both parents	566 (96.3)
Single mother	19 (3.2)
Single father	3 (0.5)
Mother graduated	
Yes	304 (51.7)
No	284 (48.3)
Number of siblings	
1	398 (67.7)
>1	155 (26.3)
Nil	35 (5.9)

Table 2: Distribution of habits of the study participants (N=588)

Variable	Participants (%)
Hours of using gadgets	
<2hours	72 (12.2)
2-4 hours	310 (52.7)
4-7 hours	171 (29.1)
>7 hours	35 (6)
Satisfied with own education	
Satisfied	217 (36.9)
Partially satisfied	291 (49.5)
Not Satisfied	80 (13.6)
Sleeping hours per day	
<6 hours	91 (15.5)
6-8 hours	479 (81.5)
>8 hours	18 (3.1)
Diet	
Vegetarian	92 (15.6)
Mixed diet	496 (84.4)
Water Consumption	
<1 litre	37 (6.3)
1-2 litres	309 (52.6)
>2 litres	242 (41.2)
Socio economic Status	
Lower class	7 (1.2)
Middle class	500 (85)
Upper class	81 (13.8)
Financial stress	
Yes	113 (19.2)
No	475 (80.8)
Mental illness in the family	
Yes	28 (4.8)
No	560 (95.2)
Any Member in the family related to medical field	
Yes	170 (28.9)
No	418 (71.1)

Table 1 shows that total 588 women medical undergraduate students with age range of 17 to 25 years with mean age of 20.54 ± 1.27 years were participated. Among them majority of them were more than 20 years (51.4%), belonging to Andhra Pradesh state (85.4%), Hindu religion (90.8%), residing in towns (49.5%), belonging to middle socioeconomic status (85%), staying in hostel (79.4%) and having both parents (96.3%). Most of the participant's mother had graduate education (51.7%), have one sibling (67.7%)

52.7% (310) were spending 2-4 hours with gadgets, 36.9% (217) were satisfied with their education, 81.5% (479) were having 6-8 hours of sleep. Majority of them were taking mixed diet (84.4%), consuming 1 to 2 litres of water (52.6%). 19.2% (113) had financial stress, 4.8% (28) had history of mental illness in the family and 28.9% (170) had some member in the family related to medical field. (Table 2)

Table 3 shows that, 34.7% (204) of medical students had depression, among them 13.6% (80) had mild depression, 12.2% (72) had moderate depression, 5.8% (34) had severe depression and 3.1% (18) had extremely severe depression. 44% (259) of them had anxiety. Among them 13.4% (79) had mild anxiety,

Table 3: Distribution of severity of depression, anxiety, and stress

Severity	Depression	Anxiety	Stress
Normal	384 (65.3)	329 (56)	410 (69.7)
Mild	80 (13.6)	79 (13.4)	80 (13.6)
Moderate	72 (12.2)	100 (17)	66 (11.2)
Severe	34 (5.8)	52 (8.8)	27 (4.6)
Extremely severe	18 (3.1)	28 (4.8)	5 (0.9)

Figure in parenthesis indicate percentage.

17% (100) had moderate anxiety, 8.8% (52) had severe anxiety and 4.8% (28) had extremely severe anxiety. 30.3% (178) of them had stress. Among them 13.6% (80) had mild stress, 11.2% (66) had moderate stress, 4.6% (27) had severe stress and 0.9% (5) had extremely severe stress.

From table 4 and table 5 it was observed that poor satisfaction with own education, less water consumption, having financial stress were significantly associated with depression, anxiety and stress. While spending more hours with gadgets and less hours of sleeping were significantly associated with depression and stress. Year of study was significantly associated with depression and mothers with graduate education was significantly associated with stress.

Table 4: Association between depression, anxiety and stress with socio demographic factors

Variable	Depression (%)(n=204)	Anxiety (%)(n=259)	Stress (%)(n=178)
Age group			
≤20 years	94 (46.1)	130 (50.2)	91 (51.1)
>20 years	110 (53.9)	129 (49.8)	87 (48.9)
Year of study			
1st MBBS	45 (22.1)*	71 (27.4)	46 (25.8)
2nd MBBS	56 (27.5) *	68 (26.3)	47 (26.4)
3rd MBBS	46 (22.5) *	65 (25.1)	47 (26.4)
4th MBBS	57 (27.9) *	55 (21.2)	38 (21.3)
State of origin			
AndhraPrdesh	170 (83.3)	220 (84.9)	148 (83.1)
Other states	33 (16.2)	39 (15.1)	30 (16.9)
NRI	1 (0.5)	0 (0)	0 (0)
Religion			
Hindu	188 (92.2)	229 (88.4)	159 (89.3)
Muslim	11 (5.4)	20 (7.7)	14 (7.9)
Christian	5 (2.5)	10 (3.9)	5 (2.8)
Residential background			
Rural	33 (16.2)	51 (19.7)	34 (19.1)
Town	101 (49.5)	123 (47.5)	88 (49.4)
City	70 (34.3)	85 (32.8)	56 (31.5)
Tribal	0 (0)	0 (0)	0 (0)
Staying in hostel			
Yes	158 (77.5)	201 (77.6)	135 (75.8)
No	46 (22.5)	58 (22.4)	43 (24.2)
Parents			
Both parents	199 (97.5)	247 (95.4)	174 (97.8)
Single mother	5 (2.5)	11 (4.2)	4 (2.2)
Single father	0 (0)	1 (0.4)	0 (0)
Mother graduated			
Yes	112 (54.9)	143 (55.2)	104 (58.4)*
No	92 (45.1)	116 (44.8)	74 (41.6) *
No. of siblings			
1	138 (67.6)	173 (66.8)	124 (69.7)
>1	53 (26)	71 (27.4)	43 (24.2)
Nil	13 (6.4)	15 (5.8)	11 (6.2)

*Statistically significant

Table 5: Association between depression, anxiety and stress with habits

Variable	Depression (%)(n=204)	Anxiety (%)(n=259)	Stress (%)(n=178)
Hours of using gadgets			
< 2hours	14 (6.9)*	26 (10)	17 (9.6)*
2-4 hours	96 (47.1) *	137 (52.9)	81 (45.5) *
4-7 hours	76 (37.3) *	80 (30.9)	66 (37.1) *
>7 hours	18 (8.8) *	16 (6.2)	14 (7.9) *
Satisfied with own education			
Satisfied	31 (15.2)*	76 (29.3)*	43 (24.2)*
Partially	116 (56.9) *	134 (51.7) *	90 (50.6) *
Not Satisfied	57 (27.9) *	49 (18.9) *	45 (25.3) *
Sleeping hours per day			
<6 hours	44 (21.6)*	49 (18.9)	42 (23.6)*
6-8 hours	148 (75.2) *	201 (77.6)	126 (70.8) *
>8 hours	12 (5.9) *	9 (3.5)	10 (5.6) *
Diet			
Vegetarian	26 (12.7)	39 (15.1)	27 (15.2)
Mixed diet	178 (87.3)	220 (84.9)	151 (84.8)
Water Consumption			
<1 litre	24 (11.8)*	24 (9.3)*	19 (10.7)*
1-2 litres	118 (57.8) *	152 (58.7) *	107 (60.1) *
>2 litres	62 (30.4) *	83 (32) *	52 (29.2) *
Socio economic Status			
Lower class	3 (1.5)	2 (0.8)	2 (1.1)
Middle class	176 (86.3)	230 (88.8)	154 (86.5)
Upper class	25 (12.3)	27 (10.4)	22 (12.4)
Financial stress			
Yes	52 (25.5)*	63 (24.3)*	45 (25.3)*
No	152 (74.5) *	196 (75.7) *	133 (74.7) *
Mental illness in the family			
Yes	17 (8.3)*	19 (7.3)	15 (8.4)
No	187 (91.7)	240 (92.7)	163 (91.6)
Any Member in the family related to medical field			
Yes	52 (25.5)	81 (31.3)	46 (25.8)
No	152 (74.5)	178 (68.7)	132 (74.2)

*Statistically significant

From table 6a it was observed that 3rd MBBS students had 49.6% of less risk of depression compared to 1st MBBS students, students with partially satisfied with own education had 3.84 times (AOR-3.854, 95% CI: 2.384-6.232) and students with not satisfied with own education had 12.527 times (AOR-12.527, 95% CI: 6.420-24.444) more risk of depression compared to students with satisfied with own education. Students who consume more than 2 litres of water had 25.4% (AOR-0.254, 95% CI: 0.113-0.571) less risk of depression compared to those who consume less than 1 litre of water.

Table 6b shows that, students with partially satisfied with own education had 1.509 times (AOR-1.509, 95% CI: 1.042-2.184) and students with not satisfied with own education had 2.736 times (AOR-2.736, 95% CI: 1.587-4.717) more risk of anxiety compared to students with satisfied with own education. Students who consume more than 2 litres of water had 34.8% (AOR-0.348, 95% CI: 0.165-0.732) less risk of anxiety compared to those who consume less than 1 litre of water. Students with financial stress had 1.822 times (AOR-1.822, 95% CI: 1.190-2.791) more risk of anxiety compared to those who not.

Table 6c shows that, students with partially satisfied with own education had 1.625 times (AOR-1.625, 95% CI: 1.045-2.527) and students with not satisfied with own education had 3.974 times (AOR-3.974, 95% CI: 2.187-7.221) more risk of stress compared to students with satisfied with own education. Students who consume more than 2 litres of water had 36% (AOR-0.360, 95% CI: 0.167-0.774) less risk of stress compared to those who consume less than 1 litre of water. Students with financial stress had 1.738 times (AOR-1.738, 95% CI: 1.090-2.772) more risk of stress compared to those who not.

Table 6: Binary logistic regression analysis of association of depression/anxiety/stress with sociodemographic factors and habits of students

Table 6a:- Depression

Variable-Depression	Adjusted odds ratio	95% CI	P value
Year of study			
1st MBBS	1		
2nd MBBS	0.976	0.541-1.762	0.936
3rd MBBS	0.496	0.273-0.900	0.021
4th MBBS	1.036	0.567-1.891	0.909
Hours of using gadgets			
< 2hours	1		
2-4 hours	1.466	0.720-2.986	0.292
4-7 hours	2.172	0.996-4.735	0.051
>7 hours	1.747	0.605-5.048	0.303
Satisfied with own education			
Satisfied	1		
Partially	3.854	2.384-6.232	<0.001
Not Satisfied	12.527	6.420-24.444	<0.001
Sleeping hours per day			
<6 hours	0.802	0.221-2.902	0.736
6-8 hours	0.39	0.116-1.308	0.127
>8 hours	1		
Water Consumption			
<1 litre	1		
1-2 litres	0.482	0.220-1.060	0.069
>2 litres	0.254	0.113-0.571	0.001
Financial stress			
Yes	1.626	0.989-2.673	0.055
No	1		
Mental illness in the family			
Yes	2.229	0.876-5.675	0.093
No	1		

Table 6b: Anxiety

Variable-Anxiety	Adjusted odds ratio	95% CI	P value
Satisfied with own education			
Satisfied	1		
Partially	1.509	1.042-2.184	0.029
Not Satisfied	2.736	1.587-4.717	<0.001
Water Consumption			
<1 litre	1		
1-2 litres	0.646	0.311-1.342	0.242
>2 litres	0.348	0.165-0.732	0.005
Financial stress			
Yes	1.822	1.190-2.791	0.006
No	1		

Table 6c: Stress

Variable-Stress	Adjusted odds ratio	95% CI	P value
Hours of using gadgets			
< 2hours	1		
2-4 hours	0.894	0.474-1.686	0.729
4-7 hours	1.46	0.743-2.870	0.273
>7 hours	1.089	0.414-2.868	0.863
Satisfied with own education			
Satisfied	1		
Partially	1.625	1.045-2.527	0.031
Not Satisfied	3.974	2.187-7.221	<0.001
Sleeping hours per day			
<6 hours	1.105	0.361-3.380	0.861
6-8 hours	0.473	0.167-1.337	0.158
>8 hours	1		
Water Consumption			
<1 litre	1		
1-2 litres	0.699	0.335-1.461	0.342
>2 litres	0.36	0.167-0.774	0.009
Financial stress			
Yes	1.738	1.090-2.772	0.02
No	1		
Mother graduated			
Yes	1.328	0.903-1.953	0.15
No	1		

DISCUSSION

The present study was conducted to assess the depression, anxiety and stress among 588 medical undergraduates by using DASS 42 scale[8,9] which revealed prevalence of depression was 34.7% (204), anxiety 44% (259) and stress 30.3% (178). This high prevalence might be due to exposure to risk factors like heavy academic work, staying away from home and family members, high pressure to succeed, and adjusting to clinical encounters. Mental illness in medical students is frequently ignored and underreported. Medical school training is intended to prepare graduates for a personally rewarding and socially meaningful career. However, reports have shown that this is a time of great personal distress for physicians-in-training.[11] It has long been recognized as involving numerous stressors that can affect the wellbeing of the students.[12]

Similar results were found in a study done by Kumar SD, et al in JSS medical college, Mysore, among 332 students, prevalence of depression, anxiety and stress were found to be 124 (37.3%), 168 (50.6%) and 109 (32.8%) respectively.[7] Similar results found in a study done by Taneja N et al, among 187 medical students of New Delhi, prevalence of depression (32.1%), anxiety (40.1%) and stress (43.8%).[13]

Prevalence of depression, anxiety and stress was found to be 40%, 50% and 37.5% respectively in 403 medical students of Government Medical College Srinagar, Kashmir.[14] In a study of 200 medical students in Gaya, Bihar, India, 27%, 30%, and 43% has depression, anxiety, and stress, respectively.[15] A study done by Iqbal S Gupta S, Venkatarao E, at Bhubaneswar, India, among 383 medical undergraduates, revealed a slightly higher levels of depression (51.3%), anxiety (66.9%) and stress (53%).[1] The reason for this difference in prevalence might be due to variations in the methodology, type of questionnaire used and differences in curriculum, teaching and learning facilities, different cultural background, lifestyle, academic management etc.[16]

In our study, first year medical students have more depression due to vast syllabus, fear of failure, parental and peer pressure, tight schedule, away from home, tough topics. Similar results noted in studies done in JSS medical college, Mysore[7] and a private college in Karnataka[17]. But according to a study done

in Bhubaneswar, second year medical students have more depression compared other year of study.[1] On joining medical college, students embark their professional journey with high expectations and are loaded with lots of new information to be crammed which at times become difficult to process. The students leave the protected, pampered, and very supportive environment of their family and come to stay in hostel under highly competitive environment. This could be contributing to the higher prevalence of depression, anxiety, and stress seen in 1st-year medical students in this study.[18]

In our study, univariate analysis showed that poor satisfaction with own education, less water consumption, having financial stress were significantly associated with depression, anxiety and stress. While spending more hours with gadgets and less hours of sleeping were significantly associated with depression and stress. Year of study was significantly associated with depression and mothers with graduate education was significantly associated with stress. Similarly, according to a study done by Iqbal S, Gupta S, Venkata Rao E at Bhubaneswar, students who were satisfied with their education had lower depression, anxiety and stress scores.[1] Similarly in other studies, along with medical education, stressors like financial stress, mental illness in the family associated with depression, anxiety and stress[1,7,10-14] and less sleeping hours associated with depression, anxiety and stress[19]. In our study, drinking water less than 1 litre strongly linked with depression, anxiety and stress as drinking water have minerals and helps in body metabolism. Similar results seen in a study done by Haghighatdoost F et al, at Isfahan University of Medical Sciences (IUMS).[20] A study done by Zaenb H etal in Saudi Arabia shows similar results of our study that is using gadgets for more hours associated with depression, anxiety, stress.[21]

Multivariate logistic regression analysis revealed that**,** the predictors of depression, anxiety and stress were, not satisfied with own education, partially satisfied with own education and less consumption of water. Year of study was found a predictor for only depression, Predictors for anxiety and stress was financial problems. But according to a study done by Iqbal S Gupta S, Venkatarao E, at Bhubaneswar, India[1], the logistic regression analysis predictor was year of study for depression, anxiety and stress. Predictor for stress is female gender. A study done by Taneja N, Sachdeva S, Dwivedi N of New Delhi[13] denotes coping up with medical syllabus as a predictor for depression, anxiety and stress. A study done by Sanjiw Kumar and Amir Kumar in Gaya, Bihar[15] coping up with medical syllabus is predictor for anxiety and stress. According to a study done in Tripura Medical college and North Bengal Medical college[22,23], the predictors for depression, anxiety and stress are Staying in hostel, not satisfied with own education, not comfortable with English. In a study done in Karachi, Pakistan[20], the predictors for depression and anxiety are students with substance abuse, mental illness in the family.

Conclusion

The present study found that the prevalence of depression was 34.7%, anxiety was 44% and stress was 30.3%. Sociodemographic and personal factors like not satisfied with own education, less consumption of water, having financial stress were significantly associated with depression, anxiety and stress. Spending more hours with gadgets, less hours of sleeping associated with depression and stress. Mothers with graduate education associated with stress. First year medical students are more depressed compared with other year students. Not satisfied with own education, partially satisfied with education, less consumption of water was found the major predictors of depression, anxiety and stress in our study. Predictors for anxiety and stress is financial stress. Students' distress may influence professional development and adversely impact academic performance contributing to academic dishonesty and substance abuse, and may play a role in attrition from medical school. Medical students under strain are either unaware of their situation or reluctant to seek help.

Limitations

This study done only in women medical undergraduate students. The present study was based on results from a self- administered questionnaire, hence reporting bias cannot be totally eliminated. This study was limited to one geographical area.

Recommendations

1. There is a need for the regular screening and counselling services to be made available to the students in the medical colleges for the early diagnosis and further control of this morbidity.

2. Further studies need to be conducted in future to identify socio-demographic factors and other factors related to academic curriculum in medical colleges so that remedial measures can be suggested at an earliest, otherwise not only medical fraternity will suffer but also society would be affected on a large scale.

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