ORIGINAL ARTICLE

Assessment of Negative Emotional States of Depression, Anxiety and Stress among First MBBS Students - A Cross Sectional Study

Monali Hiwarkar[1], Anjali Prasad[2], Mahendra Kumar Pant[3] and Onjal Taywade[4]
Associate Professor of Anatomy, Government Doon Medical College, Dehradun[1], Assistant Professor of Anatomy, Shri Krishna Medical College & Hospital, Muzaffarpur[2], Professor of Anatomy, Government Doon Medical College, Dehradun[3] and Associate Professor of Biochemistry, Government Doon Medical College, Dehradun[4], India.

Abstract:

Background and Introduction:
Modern lifestyle is full of expectations, struggle, deadlines and frustrations. Medical students all around the world face huge stress during graduation period. Hence, we wanted to evaluate the degree of depression, anxiety and stress among first year MBBS students of a private Institute of Madhya Pradesh, India.

Aims and Objectives:
1. To assess and quantify the level of depression, anxiety and stress among first MBBS students and study its relationship with gender.
2. To find out the difference in DASS (Depression Anxiety and Stress Scale) scores during stressed and relaxed state.

Material and Methods:
This cross- sectional study was conducted among 200 first MBBS students in a private medical college, in Indore. A standard questionnaire-DASS 21 (Depression Anxiety and Stress Scale) was administered to these students twice; first during relaxed state i.e. two weeks before exams & later in stressed state on the day of exam.

Results:
A greater number of participants had normal DASS scores during relaxed state as compared to the stressed state. The severity of symptoms was moderate in depression subscale, severe in anxiety subscale & mild in stress subscale both in relaxed & stressed state.
There was a significant difference between total DASS scores in relaxed versus stressed state (p<0.01); scores lower during relaxed state as compared to the stressed state. We could only find a significant correlation between anxiety and gender; anxiety in males being higher as compared to females.

Conclusion:
The level of depression, anxiety and stress is less in relaxed state as compared to the stressed state. The perception of depression and stress by DASS score is similar in both the genders, but we found a difference in the level of anxiety, being more in males. There is a need for routine screening of depression, anxiety and stress among medical students for early detection and better management.

Keywords: First MBBS, Depression, Anxiety, Stress.

Introduction:
Modern lifestyle is full of expectations, demands, struggles, deadlines and frustrations. This may lead to stress and anxiety and even depression in many individuals. Though an optimal level of stress is useful as it helps a person to perform and excel in his/her task, it has negative effects on health of an individual, physically, as well as psychologically[1].
Stress can be defined as a process where environmental demands exceed individual's adaptive capacity,

resulting in psychological as well as biological changes, which may increase risk of diseases[2].
Anxiety is a psychological and physiological state characterized by cognitive, somatic, emotional and behavioural components[2]. Depression is a mood disorder characterized by symptoms like feeling of hopelessness, guilt, worthlessness and/or helplessness. It may also present with symptoms such as persistent sadness, anxious or empty feelings, irritability, restlessness and loss of interest in activities or hobbies once pleasurable[2]. Medical education is amongst the most stressful educational activity. A medical student during graduation, faces stress in the form of acclimatization to a new environment, new subjects, peer pressure, fear of seniors and of course the examinations. Apart from this, high self-expectations and expectations by family and society make medical student prone to experience greater stress and anxiety. Physical, mental and social abuse of medicos commonly known as ragging by the seniors may also add up to frustrations among medical students. The stress is expected to be more during exam times due to the obvious reasons like pressure to complete syllabus in time, or to face viva as well as stress associated with the uncertainty of the results[3]. Even today, psychological disorders are often neglected because of the stigmas attached to them and also because of non-specificity in diagnosis, indefinite clinical presentations and long follow-up[4]. Medical students all around the world have shown an increase level of stress and depression[5-9]. However, little attention has been paid towards evaluation of depression, anxiety and stress among medical students in India. Hence, the present study was designed to evaluate the degree of depression, anxiety and stress among first year MBBS students of a private institute of Madhya Pradesh, India.

Aims and Objectives:
1. To assess and quantify the level of depression, anxiety and stress among first MBBS students of a private medical college in Indore and study its relationship with gender.

2. To find out the difference in DASS (Depression Anxiety and Stress Scale) scores during stressed state and relaxed state.

Material and Methods:
This cross-sectional study was conducted among 200 first MBBS students in the age range of 19 to 24 years. at a private medical college in Indore, Madhya Pradesh from October 2019 to January 2020. Apparently healthy and willing participants were included in this study. Institutional Ethical Committee approval was obtained from the institution. A standard questionnaire DASS 21(Depression Anxiety and Stress Scale) was administered to these students, after taking their valid informed consent, during lecture hours in the classroom. The DASS questionnaire was given twice; first during relaxed state when there were no exams i.e. two weeks before exams & later in the stressed state on the day of exam before going to practical viva voce. Demographic details like age, sex were noted. DASS-21 is a 21-item short version synthesized from the original 42-item survey[10]. This pre-validated questionnaire has seven items for each of the three scales designed to measure the negative emotional states of DASS. The questions 3, 5, 10, 13, 16, 17, and 21 form the depression scale; questions 2, 4, 7, 9, 15, 19, and 20 forms the anxiety scale while questions 1, 6, 8, 11, 12, 14, and 18 are covered in stress scale. A four-point severity/frequency scale was used to rate the extent to which the respondents had experienced each symptom over the past week from "never" (0) to "most of the time" (4). The sum of the scores obtained was multiplied by 2 and then evaluated as per the severity-rating index. In our study, the scores under severe & very severe group were taken together for ease of analysis. Data was collected & analysed using SPSS-20 version. As the distribution of Data was not normal (Shapiro Wilk test, p-value < 0.05), non-parametric tests like Wilcoxon signed rank & Mann Whitney U

test were applied for comparing the data. Chi-Square test was applied to assess the relation of Depression, Anxiety and Stress scores among male & female participants during stressed & relaxed state.

Results:

Table No 1: Distribution of participants based on DASS score during relaxed state & stressed state

DASS score (Relaxed state)	Normal			Mild			Moderate			Severe		
Subjects Total (n=200)	Total No. (%)	Female No. (%)	Male No. (%)	Total No. (%)	Female No. (%)	Male No. (%)	Total No. (%)	Female No. (%)	Male No. (%)	Total No. (%)	Female No. (%)	Male No. (%)
Depression	126 (63)	59 (29.5)	67 (33.5)	20 (10)	15 (7.5)	5 (2.5)	38 (19)	18 (9)	20 (10)	16 (8)	6 (3)	10 (5)
Anxiety	91 (45.5)	52 (26)	39 (19.5)	23 (11.5)	6 (3)	17 (8.5)	36 (18)	14 (7)	22 (11)	50 (25)	26 (13)	24 (12)
Stress	133 (66.5)	63 (31.5)	70 (35)	40 (20)	22 (11)	18 (9)	17 (8.5)	7 (3.5)	10 (5)	10 (5)	6 (3)	4 (2)
DASS score (Stressed state)	Total No. (%)	Female No. (%)	Male No. (%)	Total No. (%)	Female No. (%)	Male No. (%)	Total No. (%)	Female No. (%)	Male No. (%)	Total No. (%)	Female No. (%)	Male No. (%)
Depression	91 (45.5)	44 (22)	47 (23.5)	33 (16.5)	18 (9)	15 (7.5)	47 (23.5)	26 (13)	21 (10.5)	29 (14.5)	10 (5)	19 (9.5)
Anxiety	42 (21)	28 (14)	14 (7)	30 (15)	13 (6.5)	17 (8.5)	58 (27)	22 (11)	36 (18)	70 (35)	35 (17.5)	35 (17.5)
Stress	110 (55)	55 (27.5)	55 (27.5)	33 (16.5)	12 (6)	21 (10.5)	32 (16)	17 (8.5)	15 (7.5)	25 (12.5)	14 (7)	11 (5.5)

DASS - Depression, Anxiety and Stress Scale.

Table No 2: Individual DASS scores grouped as normal, mild, moderate and severe range expressed as mean and STD deviation

DASS score Relaxed state	Normal range (mean ± SD)	Mild range (mean ± SD)	Moderate range (mean ± SD)	Severe range (mean ± SD)
Depression	4.24± 2.51	10.50± 0.88	16.65± 2.05	26.13± 4.22
Anxiety	3.45± 1.93	8.00±1.0	11.59± 1.79	20.98± 5.73
Stress	7.31± 3.55	17.05± 1.01	22.12± 1.65	28.20± 2.39
DASS score Stressed state	Normal range (mean ± SD)	Mild range (mean ± SD)	Moderate range (mean ± SD)	Severe range (mean ± SD)
Depression	4.57± 2.64	10.75± 0.98	16.81± 2.23	26.69± 4.08
Anxiety	3.57± 2.0	8.00± 1.2	11.72± 1.66	23.30± 6.66
Stress	8.42± 3.80	17.13± 1.0	21.56± 1.74	29.04± 3.61

Table No 3: Comparison of participants based on total DASS score values

Total DASS score	n=200 (mean± SD)	Males (mean± SD)	Females (mean± SD)	p-value
Relaxed state	30.37± 19.84	30.71± 19.17	30.02± 20.60	0.57
Stressed state	39.67± 22.65	40.04± 21.83	39.29± 23.58	0.66

Table No 4: Comparison between male & female participants based on individual DASS score in relaxed and stressed state

Relaxed state scores	Males (mean± SD)	Females (mean± SD)	p-value
Depression	9.16± 7.34	8.80± 7.60	0.66
Anxiety	10.10± 7.19	9.55± 8.40	0.19
Stress	11.45± 7.10	11.67± 7.16	0.88
Stressed state scores	**Males (mean± SD)**	**Females (mean± SD)**	**p-value**
Depression	12.24± 8.51	11.14± 8.06	0.43
Anxiety	13.49± 7.94	13.37± 9.51	0.42
Stress	14.31± 7.78	14.78± 8.53	0.78

Table No 5: Relation between individual DASS scores during relaxed & stressed state in male & female participants.

	Chi- Square test	Significance (p- value)
DASS scores during relaxed state	Depression	0.72
	Anxiety	0.03[*]
	Stress	0.51
DASS scores during stressed state	Depression	0.86
	Anxiety	0.01[*]
	Stress	0.75

[*]Significance level of p- value < 0.05

Table No 6: Comparison of prevalence of depression anxiety & stress according to DASS scores with similar published studies.

Sr. no	Author of the study		Year of study	Sample size (no.)	Depression (%)	Anxiety (%)	Stress (%)
1	Vaidya PM et al [16]		2007	109	51.37	66.05	39.44
2	Iqbal et al[17]		2015	353	51.3	66.9	53
3	Sunil kumar et al[4]		2016	332	37.6	52.1	33.7
4	Moutinho et al[18]		2016	761	34.6	37.2	47.1
5	Sumaya et al[11]		2017	247	55.9	66.8	54.7
6	SM Abu Alim [19]		2017	105	54.3	64.8	59
7	Subita et al [20]		2018	101	33.7	34.7	14.8
8	Present study	Relaxed state	2020	200	33.5	54.5	37
		Stressed state		200	45	79	54.5

Table No 7: Significance of DASS scores between male and females in similar published studies.

Sr no	Author of the study		Year	Sample size	Male	Female	p-value in Depression	p-value in Anxiety	p-value in Stress
1	Iqbal et al[17]		2015	353	145	208	<0.05*	<0.05*	<0.001*
2	Roy PP et al[3]		2015	200	100	100	<0.001*	0.50	0.84
3	Sunil kumar et al[4]		2016	332	215	193	0.01*	0.22	0.05
4	Moutinho et al[18]		2016	761	336	425	0.03*	0.61	<0.001*
5	Sumaya et al[11]		2017	247	134	113	0.17	0.16	0.008*
6	SM Abu Alim et al[19]		2017	105	57	48	0.71	0.65	0.89
7	Subita et al[20]		2018	101	58	43	0.31	0.21	0.41
8	Sravani et al[21]		2018	845	200	645	0.97	0.66	0.94
9	Present study	Relaxed state	2020	200	102	98	0.66	0.19	0.88
		Stressed state					0.43	0.42	0.78

*Significance level of p- value < 0.05

This study covered 200 participants (102 males and 98 females) with a mean age of 19.33 ± 1.37 years. DASS scores were calculated during the relaxed state i.e. two weeks before the exam and later during the stressed state i.e. just before going for the exam viva voce.

A greater number of participants had normal DASS score during relaxed state as compared to stressed state. (Table No.1) The severity of symptoms was predominantly moderate in depression subscale, severe in anxiety subscale & mild in stress subscale both in relaxed & stressed state. During relaxed state about 33.5 % participants had depression, 54.5 % had anxiety & 37 % had stress; whereas 45 % had depression, 79 % had anxiety & 54.5 % had stress during the stressed state. Though depression & stress was more among females and anxiety was more in males during relaxed state; in stressed state, all 3 parameters were found to be more in males.

The individual DASS scores during relaxed state was less as compared to the stressed state. (Table 2)

There was a significant difference between the total DASS score in relaxed versus stressed state (p<0.01). However, there was no significant difference in total DASS scores of male & females during relaxed or stressed state. (Table 3) There was no significant difference in individual mean depression, anxiety & stress scores during relaxed versus stressed state. (Table 4) We could find a significant relation between anxiety and gender. Results for anxiety in males were high as compared to females during relaxed as well as stressed state. (Table 5)

Discussion:

At the inception of the first year, a medical student gets the mixed feeling as he/she joins medical institute. On one hand there is euphoria of getting selected in the medical stream, dreams and a sense of pride, while on the other, there is apprehension about the new course with tough theory subjects and strange practical activities like dissection. Moreover, medical students have to face many stressful situations like adjusting to a new environment, peer pressure, fear of seniors and of course the never-ending examinations. Apart from this, high self-expectations, expectations by the family or society coupled with the responsibility of dealing with human health, makes medical student prone to experience more stress and anxiety. Ragging or abuse of these newcomers also generates feeling of being a victim. On the other hand, there is no academic program or support system to deal with such situations. This further adds to the stress and students often feel helpless.

Some degree of stress is obviously helpful for students in meeting new challenges and inculcating the habit of discipline. But persistently high & unrelieved stress can lead to psychological, physical & behavioral problems. Few other factors like home sickness, adapting to new college environment, relations with new friends may add to the stress perceived by the students. Being a medical student requires sacrifice of social as well as personal life that can cause discomfort and stress[11]. On top of this, examinations act as an unavoidable natural stressor leading to increased stress, anxiety & depression[4].

Various studies have revealed a high prevalence of anxiety, depression, and stress among medical students. Dyrbye et al conducted a nationwide survey in United states to compare the prevalence of burnout and other symptoms of psychological distress among medical students relative to the general population and found that, medical students were more likely to report depressive symptoms compared to college students of similar age from the general population[12]. Miller et al investigating first-year students postulated that stress in this group stemmed from the nature and overload of the work inherent to the medical course, as well as from the academic structure of the course and its teaching methods[13]. The exhaustive medical curriculum and the volatile nature of subject's demands repeated reading by a student. Furthermore, the ever-increasing medical information also demands additional reading for keeping the knowledge up to date[14]. This unquenchable thirst of knowledge & associated stress often leads to a

high prevalence of psychological illness among medical students[15].

The DASS screening and outcome measures reflect the status of past 7 days. Hence in the present study, the questionnaire was administered twice i.e. two weeks prior to exam & just before appearing for the actual exam. We found that, during relaxed state, about 33.5 % participants had depression, 54.5 % had anxiety & 37 % had stress whereas 45 % had depression, 79 % had anxiety and 54.5 % had stress during the stressed state. As expected, there was a significant difference between total DASS score in relaxed versus stressed state (p<0.01).

Likely reasons for increased perception of stress, anxiety and associated depression can be parental pressure, high self-expectations, inadequate time management, a habit of procrastination, vast syllabus, tough curriculum etc. This is often complicated by issues like losing interest in academics due to personal issues like emotional disturbance etc. On the contrary lack of physical exercise and distractions in the form of mobiles and the internet prevents counterbalancing of the stress. The incidence of these psychological issues was more during the examination times, which can be attributed to the zeal to achieve better grades and outperform others.

In a similar study by Roy PP et al there was no significant difference between DASS scores among male and female participants[3]. But female participants had higher depression, while males had higher stress scores. In our study, we could not find a significant relation between depression and stress scores with gender. However, anxiety was significantly more in males during relaxed as well as stressed state (Chi-square test p<0.05) (Table 5). We could find a significant relation of anxiety being reported more in males as compared to females, which resemble the above study.

The distress perceived by the students influence their professional development and adversely impact academic performance contributing to academic dishonesty & may even lead to substance abuse. Early

screening and intervention are advisable for reducing the stress, anxiety and depression during initial phase. This can be achieved easily with few sessions of counselling which helps to boost student's moral and thereby academic performance. Furthermore, the faculty needs to be educated regarding the signs and symptoms of anxiety, depression and related psychological illness. Since faculty regularly gets the opportunity to interact with the students, they can be the first point of contact for early detection of any stress related psychological illness. This can be supplemented with yearly or six-monthly DASS scoring of the students. The students with abnormal scores can be further evaluated by a psychiatrist and counseled appropriately.

Stephenson et al. have given excellent recommendations to reduce stress among medical students like: a) Form a study group, b) Maintain a close group of friends, c) Know your limit and set your own goals, d) Maintain social activities outside of medicine, e) Be part of a mentorship program, f) Volunteer to run extracurricular events promoting healthcare and support to the community etc[22]. These simple solutions can be easily implemented depending on the resources and additional steps can be taken by the institutional academic committee to cope up with the stress. There are few good steps taken by the government of India like provision of the anti-ragging committee at every institute and strict law to deal with such issues. Medical council of India has started a foundation course for the first year MBBS students from the year 2019, which is focused on the overall professional development of the students. Thus, a student-centred learning environment with activities like physical exercise, group interaction, emotional support, mentoring by faculty, family support etc. are ideal for better psychological health and overall wellbeing of medical students.

Limitation:

In self-reporting and close- ended questionnaire, bias due to inappropriate choice filling cannot be totally

eliminated. Incorrect understanding of the question by the respondents may further add to wrong response.

Conclusion:

The level of depression, anxiety and stress are less in relaxed state as compared to the stressed state. The perception of depression and stress by DASS score is similar in both the genders, but we found a difference in the level of anxiety, being more in males. However, this needs to be verified on a larger population. There is a need for routine screening of depression, anxiety and stress among medical students for early detection and better management.

Conflict of Interest - Nil
Sources of Support - Nil

References:

1. Lakshmi Rajesh CH, Ananda Reddy Endreddy, Shaik S, Rajana B. Perceived stress and prevalence of depression among first year medical students. International Journal of Contemporary Medical Research 2017; 4(11):2346-2349.

2. Wahed Abdel WY, Hassan SK. Prevalence and associated factors of stress, anxiety and depression among medical Fayoum University students. Alexandria Journal of Medicine 2017; 53: 77-84.

3. Roy PP, Kumar SS, Doshi MA. Depression, anxiety and stress among first year undergraduate medical students. Asian journal of Biomedical and Pharmaceutical Sciences 2015; 5(45): 37-38.

4. Kumar SD, Kavitha HS, Kulkarni P, Siddalingappa H, Manjunath R. Depression, anxiety and stress levels among medical students in Mysore, Karnataka, India. International Journal of Community Medicine and Public Health 2016; 3:359-362.

5. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Academic Medicine 2006; 81:354-373.

6. Salam A, Yousuf R, Bakar SM, Haque M. Stress among medical students in Malaysia: a systematic review of literatures. Internal Medicine Journal 2013; 20:649-655.

7. Rab F, Mamdou D, Nasir. Rates of depression and anxiety among female medical students in Pakistan. East Mediterr Heal J. 2008; 14:126-133.

8. Inam SN, Saqib A, Alam E. Prevalence of anxiety and depression among medical students of private university. Journal of Pakistan Medical Association 2003;53:44-47,

9. Rehmani N, Khan QA, Fatima SS. Stress, anxiety and depression in students of a private medical school in Karachi, Pakistan. Pakistan Journal of Medical Science 2018; 34:696-701.

10. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety Stress Scales. 2nd ed. Sydney: Psychology Foundation; 1995.

11. Sumaya B, Binanzan N, Alhassan A. Depression, anxiety and stress in dental students. International Journal of Medical Education. 2017; 8:179-186.

12. Dyrbye LN, West CP, Satele D, et al. Burnout among U.S. medical students, residents, and early career physicians relative to the general U.S. population. Academic Medicine 2014; 89(3):443-451.

13. Miller P, Surtees P. Psychological symptoms and their course in first-year medical students as assessed by the Interval General Health Questionnaire (I-GHQ). British Journal of Psychiatry 1991; 159(2):199-207.

14. Moir F, Yielder J, Sanson J, Chen Y. Depression in medical students: current

insights. Advances in medical education and practice 2018; 9: 323-333.

15. Desphpande AV. Anxiety levels in First Year MBBS Students, JMSCR Volume 2 Issue 11 November 2014

16. Vaidya PM, Mulgaonkar KP. Prevalence of depression anxiety & stress in undergraduate medical students & its co-relation with their academic performance. Indian Journal of Occupational Therapy 2007; 39(1):7-10.

17. Iqbal S, Gupta S, Venkatrarao E. Stress, anxiety & depression among medical undergraduate students & their socio-demographic correlates. Indian Journal of Medical Research March 2015; 141: 354-357.

18. Moutinho ILD, Moutinho IL, Maddalena NC, Roland RK, et al. Depression, stress and anxiety in medical students: A cross-sectional comparison between students from different semesters. *Revista* da Associacao Medica Brasileira 2017; 63(1):21-28.

19. Alim SAH, Rabbani MG, Karim E, Mullick MS, Mamun A., Fariduzzaman, Khan, MZ. Assessment of depression, anxiety and stress among first year MBBS students of a public medical college, Bangladesh, Bangladesh Journal of Psychiatry 2015; 29(1):23-29.

20. Subita PP, Snehashree S, Seema BG. Study of Depression, Anxiety and Stress among Undergraduate Medical Students of a Teaching Medical Institution. National Journal of Community Medicine 2018; 9(8):566-569.

21. Sravani A, Doshi D, Kulkarni S, Reddy P, Reddy S. Depression, anxiety and stress among undergraduate dental students in Hyderabad City, Telangana, India: A cross – sectional study. Journal of Indian Association of Public Health 2018; 16: 26-29.

22. Stephenson JM, Li M.; Medical school and the enculturation of self-neglect. Medical Student Journal of Australia, 2011; 3(2) available from http://msja.anu.edu.au/archive/issue/05/medical school-and-the-enculturation-of-self-neglect.php.

Address for correspondence: Dr. Onjal Taywade, Associate Professor of Biochemistry, Government Doon Medical College, Dehradun. Email: dronjal@gmail.com, Mobile: 9654824143