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Assessment of depression, anxiety, stress, and cognitive parameters in medical students: A pilot study

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ABSTRACT

Background: As there is an increase in mental health issues among medical students, it is mandatory to assess their mental health status. In our earlier studies, we observed differences in the scores of depression, anxiety, and stress between male and female students. **Aims and Objectives:** The present study was undertaken to assess depression, anxiety, stress, and cognitive parameters in male and female medical students. **Materials and Methods:** A total of 100 medical students' males (n = 50) and females (n = 50) were part of the study after obtaining voluntary, written informed consent. The required sample size for the study was 97 with a 95% of confidence level, 10% of margin of error, and 50% of the population proportion. This means 97 or more measurements/surveys are needed to have a confidence level of 95% that the real value is within ±10% of the measured/surveyed value. Depression, anxiety, and stress were assessed using the DASS 21 questionnaire. Spatial and verbal memory test was administered to assess the cognitive functions. **Results:** The depression scores were significantly higher ($P < 0.0001$) in females when compared with males. Anxiety scores were significantly higher in females when compared with males ($P < 0.0001$). Stress scores were significantly higher ($P < 0.0001$) in females when compared with males. Spatial ($P < 0.0001$) and verbal ($P = 0.0141$) memory was significantly higher in females when compared with males. **Conclusion:** There were significantly higher levels of depression, anxiety, and stress scores in female students when compared with males. Further, spatial and verbal memory was also higher in females. There is a strong need for further detailed studies in this area and for adopting adequate management methods to manage negative psychological emotions in females.

Key words: Depression; Anxiety; Stress; Cognition; Medical students

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INTRODUCTION

Mental health is a major issue of concern globally. Further, the age group of young adults was more prone to develop mental health issues. It was well known that the majority of suicides are happening in this age group. There may be various factors that create the mental health problems such as a financial burden, academic stress, and social inhibition. Expectations from parents and teachers, etc., many studies are highlighting the importance of assessment of the mental health of the students on regular basis. Further, few studies suggested the need for a mental health cell to address the mental health issues of the students. Depression, anxiety, and stress are the negative psychological emotions that interfere with everyday life activities. They lead to a decrease in the quality of life of an individual if not diagnosed and managed in time. Further, the students themselves are not aware that they are under stress until they were assessed using standard tools. Hence, regular assessment of these negative psychological emotions is mandatory

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for college students. Cognitive functions are essential for students to manage their academics successfully. Skills such as learning and memory are most necessary for them to handle the examinations. Depression and anxiety in excess and unmanaged adversely affect cognitive functions and have a negative impact on the academic performance of the students. Hence, there should be regular assessment of these parameters in medical students as they undergo enormous levels of stress.[1-5] Hence, the present study was designed to assess the levels of depression, anxiety, and stress, and cognition in medical students.

Aims and objectives

The present study was designed to assess the levels of depression, anxiety, and stress, and cognition in medical students.

MATERIALS AND METHODS

Study design

The present study was a cross-sectional study.

Study setting

The present study was conducted at R.D. Gardi Medical College, Ujjain, Madhya Pradesh, India. The study was conducted between January 2022 and July 2022.

Study participants

A total of 100 medical students' males (n=50) and females (n=50) were part of the study after obtaining voluntary, written informed consent. The study protocol was approved by the Institutional Human Ethical Committee. The following inclusion and exclusion criteria were used to recruit the participants.

Inclusion criteria

Willing apparently healthy participants of both genders within the age group of 18–24 years were included in the study.

Exclusion criteria

Participants with severe complications, undergoing some other adjunctive therapies already were excluded from the study.

Assessment of depression, anxiety, and stress

Depression, anxiety, and stress were assessed using the DASS 21 questionnaire. This is a standard and self-administered questionnaire which consumes around 15 min to fill the questionnaire.[6]

Assessment of cognition

Spatial and verbal memory test was administered to assess the cognitive functions. These are standard tests to assess cognitive functions.[7] The numbers and words used in our test were 10. For the assessment of spatial memory, ten pictures were displayed to the subject for a period of 1 min. Followed by a 1-min break, where he was given a mathematical calculation to solve. This is just to deviate him. Soon after the break, he was asked to recall the pictures. A score of one is given for correct recall. For the assessment of verbal memory, the procedure is the same as spatial memory, but the displayed was numbers of three digits.

Ethical considerations

The present study protocol was approved by the Institutional Human Ethical Committee (IEC/14/4 dated20-12-2021). Confidentiality of data was maintained. Voluntary and informed consent was obtained from all the participants.

Statistical analysis

The required sample size for the study was 97 with a 95% of confidence level, 10% of margin of error, and 50% of the population proportion. This means 97 or more measurements/surveys are needed to have a confidence level of 95% that the real value is within ±10% of the measured/surveyed value. Data were analyzed using SPSS 20.0 version. Student t-test was applied to assess the significance of the difference between the groups. A $p < 0.05$ was considered significant.

RESULTS

Table 1 presents the depression, anxiety, and stress scores of the female participants. Most of the female participants were having moderate depression and anxiety levels. Most of the female participants were having severe stress scores. Table 2 presents the depression, anxiety, and stress scores in male participants. Most of the males were having moderate depression scores. Most of the males were having mild anxiety scores. Most of the males were having mild stress scores. Table 3 presents the spatial and verbal memory scores of male and female participants. Both spatial and verbal memory was significantly high in female participants.

DISCUSSION

Mental health is a major public health issue in recent years. There is a marked increase in mental health issues, especially in medical students. Academic pressure and financial burden were reported to be the major causes.[8-11] Earlier studies reported excessive amounts of depression, anxiety, and stress in medical students and it varied among the genders and semesters.[12] The present study was undertaken to assess and compare depression, anxiety, and stress in male and female medical students. Medical training is very tedious and it itself deteriorates the mental health of the

Table 1: Depression, anxiety, and stress scores in female participants (n=50)

Parameter	Depression	Anxiety	Stress
Normal	5 (10)	6 (12)	4 (8)
Mild	10 (20)	4 (8)	6 (12)
Moderate	24 (48)	26 (52)	8 (16)
Severe	10 (20)	10 (20)	22 (44)
Extremely severe	1 (2)	4 (8)	10 (20)

Data were presented as frequency and percentage

Table 2: Depression, anxiety, and stress scores in male participants (n=50)

Parameter	Depression	Anxiety	Stress
Normal	10 (20)	8 (16)	6 (12)
Mild	10 (20)	22 (44)	30 (60)
Moderate	20 (40)	10 (20)	4 (8)
Severe	4 (8)	2 (4)	4 (8)
Extremely severe	6 (12)	8 (16)	6 (12)

Data were presented as frequency and percentage

Table 3: Spatial and verbal memory scores of the participants

Parameter	Females (n=50)	Males (n=50)	P-value
Verbal memory	7±0.28	6±0.28	0.0141*
Spatial memory	9±0.14	6±0.42	<0.0001***

Data were presented as mean and SEM. *P<0.05 is significant, **P<0.01 is significant, ***P<0.001 is significant

students. This excessive stress has a negative impact on the physical and mental health of the students and decreases their quality of life.

There is an increase in the incidence of depression, anxiety, and stress globally.[13] Although it is a global issue, the importance given to this was very little.[14] It was reported that due to the heavy workload, the medical students feel distressed and disappointed.[15] This will lead to absenteeism and a decrease in academic performance. The present study findings were similar to the observations reported by earlier researchers.[16-18] Stress is the root cause of anxiety and depression. Poor coping with stress leads to the development of anxiety, depression, and suicidal ideation. Anxiety can be diagnosed by symptoms such as headache, palpitations, and sweating. Rana et al., reported that the stress levels in medical students were further increased after the COVID pandemic.[19] Many studies reported excessive amounts of depression, anxiety, and stress in medical students.[20-22]

Higher levels of anxiety were reported in female students. Interestingly, the prevalence of depression was high in male students.[23] Significant negative correlation was reported between depression and anxiety with the academic performance of the students.[24] In the present study, we have observed higher levels of negative psychological emotions in females. Cognition is the thinking process of the brain. The two-way circuit between the sensory and motor cortex and basal ganglia and cerebellum is essential for cognitive functions.[11] Spatial memory deals with the memory of images. Verbal memory deals with the memory of words. Both these are very essential for college students to deal with their academics. The present study results showed that both these memories are very good in females when compared with males. However, they also have higher levels of stress. This needs to be addressed as an emergency issue. The students must be regularly monitored and those with higher levels of stress must be subjected to counseling and other methods of management. The awareness of mental health must be of prime importance in medical education. Those mentally sound can perform better academically and can become successful doctors.

Limitations of the study

The study results may not be generalized due to its small sample size.

CONCLUSION

There were significantly higher levels of depression, anxiety, and stress scores in female students when compared with males. Further, spatial and verbal memory was also higher in females. There is a strong need for further detailed studies in this area and for adopting adequate management methods to manage negative psychological emotions in females.

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