



Assessment of Mental Stress among First Year Medical Students and Change in Level of Stress before Examination

Authors

Snigdha Prava Mishra, Minati Patnaik

Associate Professor, Department of Physiology, M.K.C.G. Medical College, Ganjam, Odisha

Corresponding Author

Snigdha Prava Mishra

Department of Physiology, M.K.C.G. Medical College, Ganjam, Odisha

Email: snigdhamishra@rediffmail.com

ABSTRACT

Background and Aim: *Students are exposed to new educational environment when they enter medical colleges. Huge syllabus, peer stress, stress of hostel life and examination are among the major factors for development of stress in medical students. We carried out this study to assess prevalence of stress among medical students and to find out the change in level of stress before examination.*

Materials and Methods: *Two stage surveys were carried out among first year medical students 8 weeks and 1 week before first professional M.B.B.S. examination. Kessler Psychological Distress Scale (K10) was used to record the response about perceived stress. Questionnaire was distributed among 116 students after verbal consent. Collected filled up questionnaire was coded in Microsoft Excel® spreadsheet. Data were presented as mean, standard deviation and percentage. Chi-square test and t-test were used according to necessity in Microsoft Excel®.*

Results: *Survey carried out 8 weeks before examination had 94% survey response rate. Sixty nine percent students had different level of stress, among them 17% had severe stress. Survey carried out 1 week before examination had survey response rate 84%. In this stage, 94% students had stress, among them 37% had severe stress and increase in stress level was statistically significant ($p < 0.0001$). Mean score of individual item of the scale also showed increase in stress among students 1 week before examination.*

Conclusion: *Majority of first year medical students have mild to moderate level of stress. Stress level increases before the examination. Most of them have moderate to severe stress before examination.*

Keywords: *Kessler Psychological Distress Scale, Medical students, Perceived stress, Psychological distress.*

INTRODUCTION

Attraction of students towards medical course is influenced by diverse familial and social factors along with self-motivational factors. When students enter medical colleges, they face sudden exposure to professional educational environment. A huge syllabus also may contribute to development of stress in undergraduate medical students. ^[1]

Learning capabilities varies among students and each student has their preferred method of learning. ^[2] However, teaching style in a medical college cannot be modified according to individual students' preference. This gap between the teaching and learning methods further increases stress of students. High prevalence of depression is also evident in medical students

which increases with increment of year of study.

^[3] Examination is another factor which increases mental stress and examination related stress also increases sympathetic nervous system activity in students. ^[4,5]

Kessler Psychological Distress Scale (K10) is widely used validated instrument to test mental stress level in recent 4 weeks period. ^[6] Hence, we designed this study to assess the level of stress among first year medical students and to determine the change in stress level before examination.

MATERIALS AND METHODS

A descriptive study was designed to assess stress level of first year medical students. For sample size calculation we reviewed previous similar studies. Study by Solanky *et al.* found that 41.2% undergraduate student suffers from severe stress during the course of study. ^[7] Study by Nagajyothi *et al.* also found similar level of stress. ^[8] Hence, we assumed that we would get similar level of stress among medical students. We used $n=4pq/E^2$ formula to calculate the minimum sample size where, n = sample size, p = proportion of population having stress = 0.4 or 40%, $q=1-p$, E = allowable error = 0.1 or 10%. ^[9] Calculated sample size was 96. Students were informed about the aim of the study with special care to decrease the chance of hypothesis guessing. As the study was a survey with self-administered questionnaire, only verbal consent from the subjects were taken.

Kessler Psychological Distress Scale (K10) was used as an instrument for assessing the stress among first year medical students. This validated scale has ten items and the responses were recorded in 5 point Likert-type scale where score 1 was given to response – ‘None of the time and 5 was given to response – ‘All of the time’. ^[6] An additional segment was added in questionnaire to record name, age, sex and roll numbers of students. Survey was carried out in two stages, first stage survey was carried out 8 weeks before first professional examination and second survey with same questionnaire was carried out 1 week

before the examination. Printed single page questionnaire was distributed among 116 students 8 weeks before first professional M.B.B.S. examination. In second stage, same was repeated among those students who participated in previous survey. After collecting the filled up questionnaire, the responses were coded in spreadsheet and kept for statistical analysis.

Statistical Analysis

According to the score, the students were divided into 4 groups: No stress (score <20), Mild stress (score 20-24), Moderate stress (score 25-29), and Severe stress (score >30) category. Chi-square test was used to compare the score of each group of the survey 8 weeks before and 1 week before examination. Unpaired t-test was used to compare the mean score of individual item in Microsoft Excel® data analysis tools. ^[10] P value of <0.05 was considered statistically significant.

RESULTS

One hundred and nine students returned filled up questionnaire in first stage survey which indicated survey response rate 94%, and 97 students returned the questionnaire in second stage of survey with response rate 84%. The result of survey conducted 8 weeks before examination showed that 69% had perceived stress. Among the subjects with stress, 33% had mild stress, 19% moderate stress and 17% had severe stress. Result of survey carried out 1 week before examination showed that 94% of students had stress. Among them 27% experienced mild stress, 30% moderate stress, and 37% had severe stress. The difference in stress level in two survey was statistically significant ($p<0.0001$) when tested by Chi-square test. Percentage of students, categorized in 4 groups of stress category is shown in Figure 1. When individual item score was compared by t-test it showed that except the item 2 and 3, all other item showed statistically significant ($p<0.05$) difference in mean score. These data are presented in Table 1.

Figure 1: Percentage of students according to sum score of ten items in K10 scale.

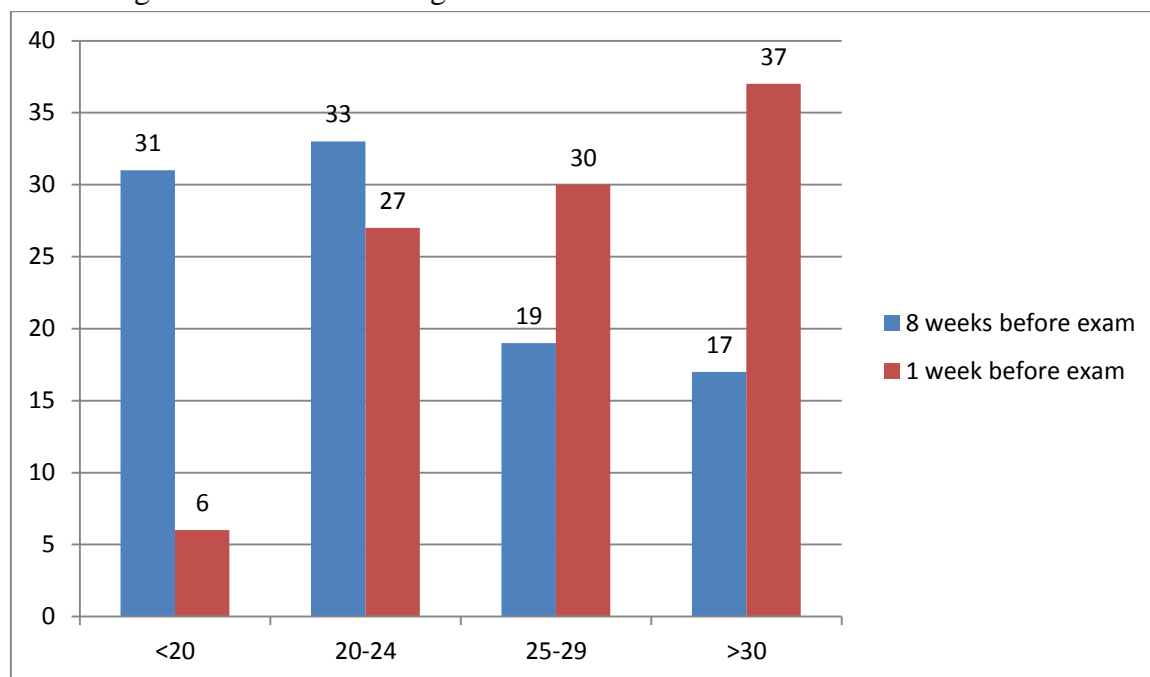


Table 1: Scores of individual scale items expressed in mean and standard deviation and compared by unpaired *t*-test.

Scale items	8 weeks before exam (n=109)	1 week before exam (n=97)	<i>P</i> value
During the last 30 days, about how often did you feel tired out for no good reason?	2.72±1.00	3.23±0.79	<0.0001*
During the last 30 days, about how often did you feel nervous?	2.58±0.91	2.58±1.03	>0.99
During the last 30 days, about how often did you feel so nervous that nothing could calm you down?	1.82±0.91	2.06±1.18	0.10
During the last 30 days, about how often did you feel hopeless?	2.22±1.08	2.86±1.05	<0.0001*
During the last 30 days, about how often did you feel restless or fidgety?	2.71±1.08	3.41±0.9	<0.0001*
During the last 30 days, about how often did you feel so restless you could not sit still?	1.98±0.87	2.74±1.06	<0.0001*
During the last 30 days, about how often did you feel depressed?	2.44±1.10	2.93±1.0	0.001*
During the last 30 days, about how often did you feel that everything was an effort?	2.89±1.14	3.40±1.08	0.001*
During the last 30 days, about how often did you feel so sad that nothing could cheer you up?	1.96±0.89	2.42±1.05	0.0008*
During the last 30 days, about how often did you feel worthless?	1.83±1.07	2.51±1.17	<0.0001*
Sum of all items	23.15±6.61	28.13±6.25	<0.0001*

* *P* value of unpaired *t*-test <0.05 was considered statistically significant.

DISCUSSION

K10 determine the stress level one month preceding to the survey. We carried out first stage of survey 8 week before first professional M.B.B.S. examination; hence this would indicate the stress level of one month period before 2 months of examination. The finding of this survey revealed that 69% of students were in stress while 31% had no stress. Among the stressed students,

17% were in severe stress group. As this survey was carried out long before the examination, it indicates the level of stress of a medical student all over the year without mental pressure of examination. Vazet *al.* assessed the stress level among first year medical students studying in a university of Zimbabwe and found that 64.5% of the students were in various levels of stress. [11] Abdulghani et al. used the K10 inventory to

determine the stress level and found 63.8% prevalence of stress among medical students of a medical college in Saudi Arabia. ^[12] Study by Saipanish et al. in medical college of Thailand found 61.4% students are in some level of stress and 2.4 % have severe stress. ^[13] Study by Essa used the same K10 scale to determine the prevalence of stress among medical students and found different level of stress among 57.2% of students and among them 12.8% were severely stressed. ^[14] Hence, the stress in medical students is evident worldwide.

For the second stage survey, we took response of students 1 week before the examination; so, this result indicate the level of stress just before examination and we found that there is increase in stress level in students. Ninety four percent of the students are stressed with remarkable 37% students in severe stress level. Study by Solanki *et al.* showed that 55.6% students experience mild to moderate stress and the principal contributing factor for stress is examination. ^[7] Thakur et al. found that stress during examination doubles in student. ^[4] Saipanish et al. also concluded that stress among increase tremendously during examination. ^[13] Result of this study is concordant with these studies carried out in India and abroad. However, study by Shendarkar *et al.* carried out a study on medical students and found no significance difference in stress level in exam going and non-exam going students. ^[15] The reason behind this result may be different survey instrument used in the study. Difference in educational ambience and examination methods are other factor which may contribute to this different result.

When the students have less perceived pressure of examination, the major psychological component felt was that everything is an effort and they feel tired without any good reason commonly. Before the examination, the effort component increases further as well as the tiredness and restlessness. Hence, during course designing and student counseling, these factors should get priority.

LIMITATIONS

We have assessed the stress level and change in stress level before first professional M.B.B.S. examination among first year medical students. Further studies with 4 different year of study and all 4 professional M.B.B.S examinations would reflect more generalized result.

CONCLUSION

Majority of first year medical students have mild to moderate level of stress. Stress level increases before examination. Majority of students face moderate to severe level of stress in preceding one month of examination. Tiredness out of no reason, restlessness and perception of effort are the major component of stress before examination.

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