REPERCUSSION OF ACADEMIC STRESS ON VITAL PARAMETERS AMONG MEDICAL STUDENTS OF AYUB MEDICAL COLLEGE ABBOTTABAD

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ABSTRACT:

OBJECTIVES:

An increased stress is a common cause of mental fatigue and physical consumption among medical students. Therefore, the purpose of this study was to assess the effect of stress on vital parameters during students' examination and to highlight the importance of personal well being among medical students.

METHODOLOGY:

The major aim of this study was to assess the effect of academic stress on vital parameters in medical students. This study was carried out in Ayub Medical College, Abbottabad in September to October 2018. The subjects selected for the study were final year MBBS students. Data was collected before and during the examinations. After taking their due consent, physical parameters such as blood pressure (both systolic and diastolic), heart rate were measured and psychological parameters like perceived stress and total mood disturbance were evaluated. Data was analyzed by using SPSS-22.

***RESULTS**:*

Parameters like blood pressure (both systolic and diastolic) and total mood disturbance score with a p-value of <.01 showed significant difference during examination. However other variables like age, height, weight, BMI, heart rate, and perceived stress score showed no significant difference.

CONCLUSION:

The study concludes that students during examinations were under pressure which resulted in anxiety and stress. Total Mood Disturbance is considered a more reliable and prominent factor in interpretation of a student's stressed and disturbed state. It is more closely related to the stress state of students than any other.

KEYWORDS: *Medical Students, Perceived Stress, Total Mood Disturbance, Vital Parameters, Body Mass Index, Heart Rate, Academic Stress*

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INTRODUCTION:

Stress, a scientific concept, much known but little understood, is much recognized today than ever before. Apparently, none of the professionals has remained oblivious of its potential negative effects. The term "stress" was first used in 1956 by Selye as external threats disturbing the homeostasis. Endocrinologists define stress as "a stimulus that disturbs our mental and physical equilibrium and reduces ability to cope even in ordinary situations"[1]. Any factor that can serve as a threat to the homeostasis is called a stressor and "the resultant response by the host" is known as the stress response. Even though organisms evolved and adapted the stress response as part of the struggle for survival, it has been noted that presence of prolonged stress responses, if severe, can result in disease precipitation and damage to body tissues[2]. Whenever a body faces any load or petition as a result of it, the non-specific reactions of the body to any external load is referred to as Stress. The body changes physiologically, this reaction includes non-specific adjustable modifications to restore the body functions. However, frequent unlimited stressful experiences with passing time may precipitate pathologic conditions[3]. And this stress is becoming a major problem in Pakistan. Person to person variations about perceived stress exist and it depends upon their adaptation, point of view, circumstances, and handling techniques. Students are exposed to complex situations with different stress stimuli such as examination, family expectation and academic performances. They need to adapt to their lifestyle. There are a number of studies showing a vast range of stress and anxiety faced by especially medical students. So, it seems very relevant and meaningful to estimate medical students' stress level[4]. Education beyond high school level (undergraduate and postgraduate) imposes more stressful conditions on students[5]. Medical profession is considered the most vast and challenging field, which induces long-term stress symptoms in medical students[6]. Medical studies are lengthy, immense, time demanding and stressed during preclinical years because of academic overburden, inner psychological pressure by family and professors to maintain remarkable scores in studies and due to inadequacy of required time. Therefore, students have to work extra hard to deal with all these stressors and this can be a serious threat to their academic progress, mental and physical health[7]. Stressful events may lead to severe anxiety and negative mood in students. An increased stress is a common cause of mental fatigue and physical consumption among medical professionals. It must be noted that the quality of healthcare delivery in hospitals is badly affected by high levels of stress among medical professionals. A significant 10.5% of doctors were reported for professional mistakes in a study conducted in England in 1997[8,9]. Previous studies have revealed that there is a certain effect of stress on vital parameters. Blood pressure and heartbeat are among these changes. The present study was aimed to assess the effect of stress on vital parameters during students' examination.

METHODOLOGY:

The study was conducted in Ayub Medical College Abbottabad, Khyber Pakhtunkhwa, Pakistan on final year MBBS students of session September to October 2018. Ethical approvals were granted by the Ethical Committee of Ayub Medical College and approval from the Principal of Ayub Medical College Abbottabad was also taken to carry on research work further. Sample size was 50 (25 samples on a normal working day and 25 on the day of examination). Subjects were selected by judgmental sampling in which healthy male/female volunteers aged 21 to 25 years not taking any specific medications and non-smokers were selected for study. Total of 50 questionnaires were collected from 25 volunteers including 5 females and 20 males both on a normal working day and the day of examination. Questionnaires were distributed among volunteers and were guided how to fill it and were collected. They were briefed about the study and were informed about the appropriate method of filling the questionnaire provided to

them. On a normal working day the researcher went to Ayub Medical College Abbottabad at 8 in the morning, taking permission from final year MBBS professors to take 1-hour time from his lecture duration. Introduced her to students and briefly explained the study, took their consent and information. Guided them how to fill a questionnaire and the participants were asked to complete 2 questionnaires, one about Perceived Stress (PSS 14) and the other one about TMD (POMS questionnaire). On the same day, after completing the questionnaire , participants were taken to the physiology laboratory of Ayub Medical College, where anthropometric measurements were done. Anthropometric measurements include measuring weight in kg using weight machine, age by asking participant, BMI by formula weight/height, height by height measuring scale in centimeters and converting it into meters afterwards, heart rate by manual pulse recording of radial artery and blood pressure by using sphygmomanometer of the individuals recorded on a separate record sheet. The weight of each volunteer was recorded using a digital balance. Volunteers were weighed, with both feet on the scale in flat position and arms on the respective lateral sides of the body. A fixed stadiometer was used to measure heights of the volunteers. The volunteers stood barefoot with the back positioned against the scale. They assumed the lateral anatomical position with chin up, and arms relaxed on the respective lateral sides. They were instructed to take a deep breath and a movable headboard was pressed on to the top of the head, with pressure enough to compress the hairs. The height was measured to the nearest 0.1 cm.

Body mass index (BMI) was calculated using the weight in kilograms (kg) divided by square of the height in meters. BMI = Weight (kg) / Height (in meter) Blood pressures were measured using the sphygmomanometer CPE 2348 after the individual rested for 5 minutes. Most of the time, the right arm was used for checking the blood pressure and in case of any ambiguity contra-lateral arm was used to confirm the readings are correct. Heart rate of the volunteers was monitored manually by counting beats at radial arteries by noting at stopwatch. Statistical analyses were carried out using SPSS-22 statistical software. P-value less than 0.05 was accepted as significant.

RESULTS:

Results were obtained for all 25 volunteers. The data were normally distributed. The analyses were easier with normal distribution of the data. Variables like systolic blood pressure in stressed (during exams) state and perceived stress in stressed state showed a normal distribution. The population in our study was all young adults (21-25 years). Five females and 20 males participated in the study. Values of systolic blood pressure before examinations were 114±10 mm of Hg and during exams were 127±12.2 and diastolic blood pressure were 80±8 mm of Hg minute, 94±9 mm of Hg before and after examination, respectively. Significant difference between, before and during exams states of participants were observed for Systolic B.P, Diastolic B.P with a p-value of <0.01. The mean PS concentration for students in stressed condition was 37.2±4.8 while the mean PS concentration for unstressed students was 33.9±3. From the concentration of the means, it is evident that the difference is not significant as observed through paired T-test (p=.011) shown in Table 1. No significant difference between the perceived stress level of both states was observed (p=0.01). The mean TMD score for students in stressed condition was 103.8±20.1 while the mean TMD score for unstressed students was 88.4±19.6. From the concentration of the means, it is evident that the difference is highly significant as observed through paired T-test (p<.001) as shown in Table 1. However, no significant difference was observed between stressed (during exams) and unstressed (before exams) states for age, height, weight, BMI (p=.946), heart rate (p=.149), perceived stress score (p=0.011). Males were taller (p=0.001), heavier (p=0.35) and had higher BMI (p=0.001) and heart rate than females. In relation to stress both PSS and TMD showed similar results, PSS score (p=0.27) and TMD (p=0.27) when compared in males and females as shown in Table 1.

Table 1: Data and Characteristics of Population of Study, Stressed and Unstressed Values

	Stressed (During Exams)	Unstressed (Before Exams)	P-Value	Female	Male	P-Value
	Mean±S.D	Mean±S.D		Mean±S.D	Mean±S.D	
Age (Years)	24±1	24±1	-	24±1.1	24±1	0.3
SBP (mm of Hg)	127±12.2	114±10	< .01	135±9	125±12.3	0.1
DBP (mm of Hg)	94±9	80±8	<.01	98±8.3	93±9.2	0.28
Height (Meters)	1.71±0.08	1.71±0.82	-	1.6±0.03	1.7±0.06	<.01
Weight (kg)	71.2±11.3	71.2±11.4	-	76±9.7	70.1±11.7	0.35
BMI (kg/m2)	24.6±3.2	24.6±3.2	0.94	20.5±3	26±2.3	<.01
Heart Rate (b/min)	84±7.7	81±8.1	0.14	79±2.5	85.2±8.1	<.01
Perceived Stress Scale Score	37.2±4.8	34±3.03	0.01	39.4±3.9	37±5	0.27
TMD Score	103.8±20.1	88.4±19.6	<.01	112.8±17.7	101.5±20.4	0.27

DISCUSSION:

As the students were recruited from final year MBBS, these students are in the same environment for almost 5 years, so it is very likely that adaptation and adjustment to such an atmosphere in the last 5 years is a cause of showing non-significant results (conditioning phenomena). A comparison with students from a non-medical discipline might have yielded different results. This study was conducted during class tests, and such tests and stages are taken frequently within a month, so it was not considered as stressful as Final Professional Examination by students as the percentage of these tests stands very low in internal assessment. Study population of our study includes young adults (21-25 years) involving five females and 20 males from the final year MBBS class of Ayub Medical College Abbottabad. This study evaluated Perceived Stress, Total Mood Disturbance (TMD) scores among medical students. The analyses undertaken in this study showed mean concentrations and values for all parameters. Mean PSS score in stressed state was 37 while in unstressed state was 34. TMD score mean in this study analysis showed 104 in stressed state and 88 in unstressed state. Insignificant relation of perceived stress was stated (p=.01) by this study in stressed and unstressed states of students. Other studies revealed similar results (p>.01) and study by Shah and colleagues concluded that there is an insignificant relation between PS and academic performance in students (p>.05) while at the same time the result was significant (p<0.05) based on gender[10-12]. TMD showed a significant difference (p<.001) for all parameters in stressed and unstressed states by our study. Years of medical studies have always been more vulnerable to mood instability. Same line of results (p<.001) as our study has been reported[13]. Mood parameters were assessed using the Depression Anxiety Stress Scale (DASS) scoring system and were found significantly raised (p<.001) by other studies[14-16]. Based on reports in this study, it can be assumed that TMD is a stronger predictor of stress level than perceived stress. Results have shown more physical impairments. Parameters like Systolic B.P, Diastolic B.P and TMD score with a p-value of <.01 showed significant difference between stressed and unstressed. This study revealed high mood derangements with psychologically and physiologically

disturbed states of students. However, other variables like age, height, weight, BMI (p=.946), heart rate (p=.149), perceived stress score (p=.011) showed no significant difference between stressed and unstressed conditions. In this study male participants were taller (p=0.001) and heavier (p=0.35) than females and they showed more BMI values (p=0.001) and increased heart rate. The results showed inconsistent scores and no significant gender difference in most of the studies conducted worldwide[17,18].

CONCLUSION:

Strong impact of stressors on college students affects their academic efficacy as well as personal life. There is a marked difference in the environments at the schools and the university environments as the latter are different and bear more challenges to students than the former. Also, the responsibilities of students in universities are more demanding and different than those in schools. There is reduced parental involvement, the students may have to live away from their family for prolonged periods of time and they may have to discharge additional duties. All these factors have been found to play a role in the development of stress especially at the beginning of academic year. Since the majority of students represent the future of their families, the society and the country, increased attention has been drawn towards the physical and mental well-being of the students at higher education institutions. Among these students, medical students are more prone to the adverse effects of academic as well as non-academic stress as they progress in their rather long academic and professional career. Results of our study highlighted the importance of mood stability during class tests because these tests are inescapable natural stress causing factors leading to stress, anxiety and gloomy mood. It is timely to disseminate the information to the administration of medical institutes that a stressful environment can precipitate mood disturbance and low productivity in medical students. This disoriented mood state can be improved by proper guidance and counseling sessions held regularly at colleges so that support to disturbed and stressed students could be provided to achieve good grades and remarkable academic scores.

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