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Effect of Stress on Academic Performance of Undergraduate Medical Students

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Abstract

Medical students experience stress during their academic years. This stress is related to financial issues, health problems, social issues and academic difficulties. Stress can either negatively or positively influence academic achievements. The aim of this study is to explore the relationship between stress and academic performance of medical students and identify sources of stress effecting academic performances.

All the medical students of undergraduate third year at Sheikh Zayed Medical College, Rahim Yar Khan, Pakistan, were invited to participate in the study. Medical Student Stressor Questionnaire (MSSQ) was used for the assessment of the effect of stress on academic performance of students. It consists of 40 items representing the six stressor domains: Academic-related stressors (ARS); Intrapersonal and interpersonal-related stressors (IRS); teaching and learning-related stressors (TLRS); social-related stressors (SRS); drive and desire related stressors (DRS); group activities related stressors (GARS). Cronbach's coefficient alpha was calculated to assess the internal consistency of the instrument and for each of the six stressor domains.

A total of 200 undergraduate medical students participated in the study. Among them 90 (45%) were males and 110 (55%) were females. All domains of MSSQ are reliable showing Cronbach's alpha greater than 0.7. Female students showed higher level of stress than males before and after exams. The major source of stress experienced by students was related to academics (2.78), followed by teaching and learning (1.88), while the domain derive and desire domain caused minimum stress to students (1.30).

Undergraduate medical students experience considerable stress in their third year. Academic related factors are the major cause of stress in students. It is important that students should be educated to manage stress effectively otherwise it can adversely influence their health and academic performance.

Keywords: Medical students; Stress; Academic performance

Introduction

Stress refers to the "sum of physical, mental and emotional strains or tensions on a person" [1]. It is defined as a condition typically characterized by symptoms of mental and physical tension or strain as depression or hypertension, which can result from a reaction to a situation in which a person feels threatened or pressured or both [2]. The term stress was first employed in the 1930's by the Endocrinologist Hans Selye [3] who published a model of stress. In this model stress is divided into eustress and distress. The stress which enhances function (physical or mental, such as through strength training or challenging work) is called eustress, while persistent stress that is not resolved through coping or adaptation and may lead to anxiety or withdrawal (depression) behavior is known as distress [3].

Literature indicates that undergraduate medical students experience stress during their academic years [4,5]. This stress is related to issues including, financial problems, health problems, social issues or academic difficulties [6]. Evidence indicates that first year medical students stress is related to more academic factors than social factors [7]. Students who begin with relatively low academic grades are more likely to experience greater stress [8]. Compared to first year, stress increases in third year [9]. Among the sources reported as stressful for students include tests and examinations, wide range of content to be learnt, lack of time to do revisions, poor marks, heavy workload and difficulty in understanding the content [10].

Studies established that chronic and continued exposure to stressful condition leads to emotional, physical and mental disturbance of the students [11,12]. Persistent stress leads to low self-esteem of students, difficulty in handling situations, sleep disorders, decreased attention and abnormal appetite which eventually effects the academic achievement and personal growth of students [13]. Stress can also lead to improved performance and one of the reasons for this could be students approach to coping with stress [14] and the other could be the environmental context [15].

There are multiple factors which influence stress among medical students [16]. However, the effect of stress on the performance of students has remained relatively unexplored. Considering that stress can either negatively or positively influence academic achievements, the aim of this study is to explore the relationship between stress and academic performance among medical students and identify sources of stress affecting academic performance. The objectives of the study are:

- To determine the sources of stress among undergraduate medical students.
- To determine the effect of stress on the academic performance of medical students.
- To determine the level of stress experienced by medical students

Methods

The study was conducted at Sheikh Zayed Medical College, Rahim Yar Khan, Pakistan. The Institutional Ethics Committee of Sheikh Zayed Medical College, Rahim Yar Khan approved the study. All undergraduate third year medical students were invited to participate in the study. Informed consent was obtained from all participants. Participation in the study was voluntary.

For the present study Medical Student Stressor Questionnaire (MSSQ) was used to determine the effect of stress on the academic performance of students [17]. It is a valid and reliable instrument which consists of 40 items representing six stressor domains: Academic-related stressors (ARS); Intrapersonal and interpersonal-related stressors (IRS); Teaching and learning-related stressors (TLRS); Social-related stressors (SRS); Drive and desire related stressors (DRS); Group activities related stressors (GARS).

Respondents were asked to rate each source by choosing from five responses, "causing no stress at all", "causing mild stress", "causing moderate stress", "causing high stress" and "causing severe stress". The scoring method assigns marks from 0 (i.e. causing no stress) to 4 (i.e. causing severe stress) to each of the responses respectively [18].

Data was analyzed using descriptive statistics. Mean was calculated for each item. Cronbach's coefficient alpha was calculated to assess the internal consistency of the instrument and for each of the six stressor domains.

Results

A total of 200 undergraduate medical students participated in the study. Among them 90 (45%) were males and 110 (55%) were females. All the students responded to all the items in the scale (item response rate=100%).

Table 1 shows Cronbach's Alpha value for each stressor domain. Table 2 shows stress level before and after exams in students. Table 3 shows stressor domain distribution of high, moderate and mild stress. Table 4 shows item means causing high, moderate and mild stress.

Stressor Domain	Cronbach's alpha Value
Academic Related Stressor (ARS)	0.87
Teaching and Learning Related Stressor (TLRS)	0.86
Intrapersonal and Interpersonal Related Stressor (IRS)	0.82
Group Activities Related Stressor (GARS)	0.81
Drive and Desire Related Stressor (DRS)	0.75
Social Related Stressor (SRS)	0.74

Table 1: Cronbach Alpha value for each stressor domain.

Variables	Mean		Standard deviation
Stress before and after exam	Before	79.73	8.8
	After	67.42	9.52
Stress before exam in male and in female	male	75.70	9.87
	female	83.03	8.19
Stress after exam in male and in female	male	65.5	9.46
	female	68.93	8.83

Table 2: Stress level before and after exams in students.

Stress Domain	Moderate Stress
Academic Related Stressor (ARS)	2.78 (87.3%)
Teaching and Learning Related Stressor (TLRS)	1.88 (86.5%)
Intrapersonal and Interpersonal Related Stressor (IRS)	1.79 (82.1%)
Social Related Stressor (SRS)	1.65 (74.3%)
Group Activities Related Stressor(GARS)	1.50 (73.9%)
Derive and Desire Related Stressor(DRS)	1.30 (70.6%)

Table 3: Stressor domain distribution of high, moderate and mild stress.

ARS	1. Getting poor marks	2.86
	2. Large amount of content to be learnt	2.83
	3. Tests/Examinations	2.80
	4. Having difficulty to understanding the content	2.75
	5. Heavy workload	2.39
	6. Falling behind in reading schedule	2.40
	7. Quota system in examination	2.01
	8. Learning context full of competition	2.11
TLRS	9. Inappropriate assignments	2.31
SRS	10. Facing illness or death of the patients	2.30
SRS	11. Frequent interruption of my work by others	2.01
	12. Unable to answer questions from patients	1.94
	13. Talking to patients about personal problem	1.66
	14. Lack of time for family and friends	1.55
	15. Working with computers	1.11
ARS	16. Unable to answer questions from the teachers	1.89
	17. Lack of time to review what have been learnt	1.90
	18. Need to do well (self-expectation	1.91
	19. Not enough medical skill practice	1.80
	20. Unjustified grading process	1.65
IRS	21. Poor motivation to learn	1.94
	22. Conflicts with other students	1.91
	23. Verbal or physical abuse by personnel (s)	1.90
	24. Verbal or physical abuse by other student (s)	1.88
	25. Verbal or physical abuse by teacher (s)	1.86

	26. Conflict with teacher (s)	1.85
	27. Conflict with personnel (s)	1.80
GARS	28. Participation in class discussion	1.90
	29. Participation in class presentation	1.87
	30. Need to do well (imposed by others)	1.80
	31. Feeling of incompetence	1.40
TLRS	32. Uncertainty of what is expected of me	1.40
	33. Not enough study material	1.74
	34. Lack of recognition for work done	1.65
	35. Teacher lack of teaching skills	1.59
	36. Lack of guidance from teacher	1.76
	37. Not enough feedback from teacher (s)	1.53
DRS	38. Family responsibilities	1.60
	39. Unwillingness to study medicine	1.60
	40. Parental wish for you to study medicine	1.59

Table 4: Domain items causing high, moderate and mild stress.

Discussion

The study was conducted to determine the prevalence of stress among medical students and to observe an association between the levels of stress and academic performances. Findings from the study indicate that there is a relationship between stress and academics; they are inversely proportional to each other. Medical education is perceived as being stressful and a high level of stress may have a negative effect on cognitive functioning and learning of medical students [19]. In the present study before exams, medical students showed higher level of stress than after exams. This finding is consistent with existing evidence in which level of stress is high before examination [20].

Females in our study demonstrated more stress as compared to male students. Misra and Castillo (2004) conducted a study in which they concluded that perception and reaction to stress is different in both genders [21]. Female students show greater anxiety, changes in physiological states and increased emotional response to stress as compared to male students [22].

In the present study Medical Student Stress Questionnaire (MSSQ) was used to determine stress among medical students. In MSSQ six domains are used for the identification of sources of stress among students. In the present study academics (ARS) was the major source of stress, and the highest three sources were "getting poor marks", "large amount of content to be learnt," and "going through tests and examinations". These findings are consistent with existing evidence that academic requirements substantially contribute to students stress levels [23-25].

In terms of teaching learning related stressors (TLRS) 'inappropriate assignments,' contributed significantly to students stress. This is consistent with existing literature that medical students are loaded with many assignments which led to increased stress [26]. However it would be assumed that these assignments would somehow contribute to their learning, while in our study inappropriate assignments indicated that students' learning is hindered by these assignments. This may imply that teachers need to be more thoughtful when giving assignments to students to ensure learning takes place.

Social related stressor (SRS) refers to any form of community and societal relationships that cause stress. In our study, 'facing illness or death of the patients,' contributed significantly to students stress. This finding is also consistent with existing evidence that students feel helpless in coping with illness and death [27]. This may imply that students need counseling and training in managing such situations.

In the present study moderate stress was found in the domains of interpersonal and intrapersonal related stressor (IRS) and group activities related stressor (GRS). In these domains majority of the items are related to conflicts and group work which according to our study findings contributed less to students' stress. Derive and desire related stressor (DRS) had the lowest prevalence, and less effect on the academic performance. It generally relates to unwillingness to study medicine due to various reasons including wrong choice by the student or parental wish to study medicine.

Overall, findings of the present study indicate that students undergo considerable stress before examinations and females students more so. Our study found that ARS is the only stressor domain that scored more than 2.00 and this indicates that it caused high stress to the students. Whereas, the other five domains; IRS (1.79), GARS (1.58), TLRS (1.87), SRS (1.66) and DRS (1.50) caused moderate stress to the students. To resolve the problem of poor academic performance, students may need to identify sources, levels of stress and a coping strategy to improve their performance.

The findings of the present study are from a single medical institution but factors inducing stress among medical students are consistent with existing evidence from other cultures. The effect of stress could have been further explored, but this can be a future longitudinal study in which students educated in managing stress effectively and its prolonged exposure could be studied.

Conclusion

Undergraduate medical students experience considerable stress in their third year. Academic related factors are the major cause of stress in students. It is important that students should be educated to manage stress effectively otherwise it can adversely influence their health and academic performances.

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