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Research Article

**STRESS AMONG MEDICAL STUDENTS IN NISHTAR
MEDICAL COLLEGE MULTAN**¹Dr. Mohsin Saeed, ²Dr. Dilawar Sher, ³Dr. Nabeel Saleem¹DHQ teaching Hospital Gujranwala²MO BHU Bandial Tehsil Quaidabad District Khushab³DHQ teaching Hospital Gujranwala**Abstract:**

This study aimed to determine the prevalence and sources of stress among Thai medical students. The questionnaires, which consisted of the Thai Stress Test (TST) and questions asking about sources of stress, were sent to all medical students in Nishtar Medical College Multan. A total of 686 students participated. The results showed that about 61.4% of students had some degree of stress. Seventeen students (2.4%) reported a high level of stress. The prevalence of stress is highest among third-year medical students. Academic problems were found to be a major cause of stress among all students. The most prevalent source of academic stress was the test/exam. Other sources of stress in medical school and their relationships are also discussed. The findings can help medical teachers understand more about stress among their students and guide the way to improvement in an academic context, which is important for student achievement.

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INTRODUCTION:

Learning and memory can be affected by stress. Although an optimal level of stress can enhance learning ability (Kaplan & Sadock, 2000), too much stress can cause physical and mental health problems (Niemi & Vainiomaki, 1999), reduce students' self-esteem (Linn & Zeppa, 1984; Silver & Glickin, 1990) and may affect students' academic achievement.

Previous studies have found stress in medical students to be associated with anxiety and depression (Rosal et al., 1997, Shapiro et al., 2000), interpersonal conflicts (Clark & Rieker, 1986), sleeping problems (Khanna & Khanna, 1990) and lower academic and clinical performance (Linn & Zeppa, 1984). There is some evidence of medical student suicide (Hays et al., 1996) and drug abuse (Newbury-Birch et al., 2000; Pickard et al., 2000).

Stress can also decrease attention, reduce concentration, impinge on decision making, and reduce students' abilities to establish good relationships with patients (Shapiro et al., 2000) resulting in their feeling inadequate and unsatisfied with their clinical practice in the future. This might affect their patients' lives and the community's health.

Linn & Zeppa (1984) considered that some stress in medical school is needed for learning. They divided stress into two categories. Stress which can be used to facilitate learning and performance is called 'favorable stress', and stress with devastating consequences is called 'unfavorable stress'. Stress may be experienced differently by students. Some stress may be considered as 'favorable stress' for some students but 'unfavorable stress' for others, depending on the individual's experience and coping skills.

The aim of this study is to investigate self-perceived stress among medical students in the students of Nishtar Medical College Multan. It is hoped that if medical teachers better understand the nature of stress among their students, they can find ways to help students reduce stress and improve academic achievement.

The specific objectives of the study are to determine the proportion of medical students who have self-perceived stress, and to identify sources of stress during medical training, especially in the academic context.

METHODS:

Step I—Focus group discussions, with 6–10 medical students in each academic level, were carried out by the author to obtain qualitative information about sources of stress during medical training.

Step II—The questionnaires were sent to all medical students in Nishtar Medical College during the second and third month of the second semester in academic year 2011 to 2012. The questionnaire consisted of three parts:

- Part I: Demographic data and personal information.
- Part II: Thai Stress Test questionnaire to measure stress levels.
- Part III: Questions about sources of stress, derived both from literature reviews and information gained from focus group discussions (as mentioned in Step I). The students were asked whether they had encountered any events listed as sources of stress during this academic year. They were then asked to rate their stress level for each particular event (from 0 ¼ 'no stress at all' to 4 ¼ 'severely stressful').

All students participating were given information about the study, and completed informed consent sent with the questionnaires.

The Thai Stress Test (TST) (Phattharayuttawat et al., 2000) was chosen as the instrument to measure stress in this study. The main reason in choosing the instrument, although it is a relatively new and still a not widely used instrument, was to reduce problems concerning cultural and language barriers, since the instrument was developed specifically to measure stress in Thai people. The Thai Stress Test consists of 24 items that describe psychological reactions (both positive and negative) in relation to events occurring in daily life of Thai people. Each could be rated on a three-point scale: 'never', 'sometimes' and 'often'. The respondents were asked to put a tick (*T*) in the column corresponding to the feeling that has applied best to them during the past month.

To calculate scores, positive and negative scores were combined separately. Weights of 0, 1 and 3 are assigned to represent 'never', 'sometimes' and 'often' respectively, then stress status is categorized by using the matrix table of the TST. The test has good reliability (alpha coefficient ¼ 0.84), and construct validity (eigenvalue > 1). It also has shown sufficient power to discriminate between people with stress disorders and normal people with statistical

significance. It is also possible to use the instrument to differentiate people into four categories: those with excellent mental health, normal mental health, mild stress, and high stress.

Analysis

The prevalence of stress in medical students was reported as a percentage. Comparing stress between variables of interest was analyzed by using a chi-squared test. Students' perceived sources of stress were reported in percentage and ranking order.

RESULTS:

Data were collected from medical students in all academic year levels (Table 1). A total of 686 medical students participated in this study. The sample comprised an almost equal number of male (49.6%) and female (50.4%) students. The mean age of students was 20.56 years (SD $\frac{1}{4}$ 1.95). Most (62.4%) had good grades for the last semester. About 60% assessed their own coping ability at the 'Fair' level.

Table 1. Demographic data.

Sex:	
Male	49.6%
Female	50.4%
Academic level:	
First year	16.5%
Second year	14.6%
Third year	14.9%
Fourth year	20.7%
Fifth year	17.9%
Sixth year	15.5%
Academic achievement:	
Excellent (> 3.5)	20.3%
Good (3.0–3.49)	42.1%
Fair (2.5–2.99)	26.4%
Poor (< 2.5)	11.1%
Coping ability (self-assessment):	
Very poor	5.0%
Fair	60.2%
Good	32.9%
Very good	2.0%

The results of the Thai Stress Test scores (Table 2) shows that 61.4% of medical students felt stressed, 59% with mild stress, and 2.4% at a high level of stress. The number of students with stress was highest among the third-years (76.5%).

Results of self-evaluation on personal problems are given in Table 3. Among their personal problems, the medical students reported that academic problems (46.8%) were a leading cause, followed by difficulty in peer relationships (42.1%), personal health problems (32.9%), and difficulty in love relationships (32.4%). Students who felt stressed reported

Table 2. Stress levels of medical students identified by Thai stress test.

Stress status	All (%)	1st year (%)	2nd year (%)	3rd year (%)	4th year (%)	5th year (%)	6th year (%)
Excellent mental health	2.3	2.7	2	–	–	7.3	1.9
Normal mental health	36.2	44.1	33	24.5	31.5	33.4	50.9
Mild stress	59.0	52.3	62	73.5	65.5	56.1	44.3
High stress	2.4	0.9	3	3	4	3.2	2.8

Thirty-one sources of stress in an academic context derived from the focus-group discussions and literature reviews

were listed in the questionnaire (Table 4). Even though many of these events happened frequently (from 18 to 99%), the stress levels of medical students for each event were different. Table 5 shows the top 15 stressful events ranked by mean stress level; seven of them were rated as higher than a moderately stressful level (2 ¼ moderately stressful). 'Test/ exam' was ranked first in stressful events, followed by 'falling behind in reading schedule', 'large amount of contents to be learnt', 'learning context—full of competition', 'getting poor mark', 'need to do well (imposed by significant others)', and 'having difficulty understanding the content'.

Table 3. Personal problems (self-evaluation).

Academic problems	46.8%
Difficulty in peer relationships	42.1%
Personal health problems	32.9%
Difficulty in love relationships	32.4%
Family health problems	26.8%
Financial problems	18.4%
Accommodation problems	12.2%
Family problems	11.3%
Drug- and substance-related problems	1.5%

Table 4. Thirty-one events reported to be sources of stress in medical school and percentage of medical students in each stress level.

Event	% of students who indicated the event happened	No.	% of students who rated level of stress	
			Mild	>Mod.
1. Test/exam	99	2	8	88.1
2. Falling behind in reading schedule	96.8	3.1	14.7	77.7
3. Large amount of contents to be learnt	96.3	3.9	18.1	72.7
4. Having difficulty understanding the contents	95	3.8	23.5	66.8
5. Getting poor marks	92.9	4.4	25.9	61.6
6. Grading on a curve	90.1	16.3	23.9	48.1
7. Lack of time to review what have been learnt	88.8	8.7	28.6	50.2
8. Need to do well (self-expectation)	88.8	8.2	24.8	54.4
9. Learning context—full of competition	88.6	7.3	21.4	58.3
10. Unable to answer question(s) from the teachers	87.3	14.3	34	37.4
11. Heavy workload	85.2	4.5	23.2	56.2
12. Participation in class discussion	85	15	36	33
13. Participation in class presentation	82	13.1	33.5	34.3
14. Need to do well (imposed by significant others)	81.5	7.4	17.5	55.2
15. Feeling of incompetence	78.4	5.7	26.2	45
16. Unjustified grading process	66.4	7	18.1	40.3
17. Not enough medical skill practicing	65.1	3.9	17.3	42
18. Lack of time for family and friends	64.1	5.8	22.9	34.5
19. Teacher—lack of teaching skills	56.8	13.1	21	22
20. Not enough study materials	55.8	16.3	22.3	16.4
21. Unable to answer questions from patients	55	9.9	20.7	22.5
22. Inappropriate assignments	54.5	8.2	19.4	25.8
23. Talking to patients about personal problems	51	12.2	23.8	13.7
24. Facing illness or death of the patients	49.3	7.7	19.1	21.3
25. Conflict with other student(s)	48.4	5.5	17.8	24.7
26. Poor motivation to learn	48	5	16.6	25.7
27. Verbal or physical abuse by other student(s)	43.9	7.4	15	20.7

28.	Verbal or physical abuse by teacher(s)	32.7	4.2	13	15.3
29.	Verbal or physical abuse by personnel(s)	32.3	5.4	12.5	14.2
30.	Conflict with personnel(s)	32.3	4.7	15.5	12.4
31.	Conflict with teacher(s)	18.5	3.1	7.3	8.4

Table 5. Top 15 sources of stress in an academic context.

Event	Mean	SD	Rank
Test/exam	2.62	0.95	1
Falling behind in reading schedule	2.46	1.05	2
Large amount of contents to be learnt	2.25	1.04	3
Learning context—full of competition	2.07	1.14	4
Getting poor marks	2.04	1.05	5
Need to do well (imposed by significant others)	2.04	1.12	6
Having difficulty understand the contents	2.03	0.97	7
Heavy workload	1.99	1.02	8
Not enough medical skill practicing	1.98	1.02	9
Unjustified grading process	1.98	1.20	10
Need to do well (self-expectation)	1.87	1.07	11
Lack of time for family and friends	1.85	1.15	12
Feeling of incompetence	1.83	1.04	13
Poor motivation to learn	1.80	1.14	14
Lack of time to review	1.78	1.07	15

DISCUSSION:

The percentage of medical students in this study who felt stressed was 61.4%. This consisted of students with both mild stress level (59%) and high stress level (2.4%). This study shows a higher level of stress than other previous studies among medical students in Pakistan. Turakitwanakan (1997) reported psychological problems in medical students at Srinakharinwirot by using the GHQ-60, and found that 24.6% of the students had mental health problems. This may be a result of using different instruments in the studies. The Thai Stress Test is a screening instrument for stressed people, so it is probable that a higher percentage of students with stress was detected in this study than in other studies.

However, Ngamthipwattana et al. (2000) who also used the Thai Stress Test reported only 17.88% of third-year medical students at Siriraj Hospital to have stress. Therefore, the difference in stress levels among medical students may also stem from the difference in each medical school setting and curriculum. In this study, the third-year medical

students seemed to be under much more stress than students in other academic year levels. This may be the result of the high frequency of tests and examinations at this academic level.

A wide range of prevalence of stress in medical students was also reported by many studies from Western countries. Mosley et al. (1994) assessed stress among third-year medical students at the University of Mississippi Medical Center (UMMC), and reported that 23% of students had a significant level of depression on the Center for Epidemiologic Studies Depression Scale, and 57% had high levels of somatic complaints using the Wahler Physical Symptom Inventory. Guthrie et al. (1995) reported that 36.8% of first-year medical students at a university in the North of England had mental health problems as measured by the General Health Questionnaire. Different instruments for stress measurement and the medical curriculum might still be the reason for the variations.

It was not surprising that academic problems were a

leading cause of personal problems in this study, because academic achievement has always been the top priority for Thai medical students. Even though other problems were also reported, their incidence was not as high as academic problems. Students with stress had also reported significantly more academic problems than students without stress.

It is interesting that other personal problems related to stress in medical students were mostly relationship problems (peer, friends, or family), which are difficult to prevent. However, if medical teachers are aware of these problems and try to understand, they can give their students support when appropriate.

Personal health problems also need to be considered seriously. The students reported that these were significantly related to stress. Medical students should know how to look after themselves very well. But why were health problems so high among medical students? The answer might be that 'they could not apply their knowledge to practice', or 'they did not have enough time to look after themselves', or 'it was a manifestation of stress'. Further studies are needed to understand this important issue more clearly.

In this study, academic achievement was not significantly related to stress level, which was a similar finding to that reported by Ngamthipwattana *et al.* (2000). This might be due to the limitation of the study design. This was a cross-sectional study, which did not follow student progression for a long time, so no changes in achievement could be identified. To consider achievement, changes in academic development should be concerned more than the level of grade at any specific time.

In the academic context, all major sources of stressful events seem to be related to each other. 'Test or exam' was the highest ranked among all stressful events in a study by Wolf *et al.* (1988). The other sources such as 'Falling behind in reading schedule', 'Large amount of content to be learnt', 'Having difficulty understanding the content', 'Heavy workload', and 'Lack of time to review' can bring more stress to medical students as well. Lloyd & Gartrell (1983) and Linn & Zeppa (1984) also reported all of these events as leading sources of stress. Solving these problems is not easy. The whole medical curriculum, including content, teaching and learning methods, and the evaluation process, needs to be analyzed and improved. The learning and practicing schedule of medical students should likewise be arranged to make it feasible for students to participate fully.

Even though 'Test/exam' is a major source of stress, it is necessary for medical training. The other necessary tasks for training are participation in class discussions and presentations, answering teachers' and patients' questions, and facing illness or death of patients. But it needs to be considered whether some events in medical schools are necessary for medical training or not. If they are not necessary, how can they be ameliorated? Though the stress level for some events was not very high, medical students had different abilities with regard to facing problems. The reduction of unnecessary sources of stress would be beneficial.

The highly competitive atmosphere in medical schools may be the result of grading on a curve. This sort of grading process needs to discriminate students to A, B, C, D. Even though their raw scores were not much different, it made a lot of difference when they were graded. It compares student with student. It does not measure what a student knows. Sometimes it is unfair, and can damage the student's academic self-concept (Cooper, 1997). For this reason, everybody competes with one another to get the highest possible marks, and supportive environments among peers are reduced. A better system of evaluation should be considered to solve this problem.

Although it is understandable that getting poor marks can increase stress, it is not the results of the assessment per se that really count. There are other factors that influence the students' perception of their own marks, especially their self-expectation and expectation from their significant others. This might explain why many students perceived themselves to have an unsatisfactory grade though most of them still got a grade higher than 2.5, which was not bad. This needs both psychological and environmental support.

Limitation of this study

This study is a cross-sectional study. Students were asked to rate their subjective feelings in the past one month, which reflected only their current level of stress. However, this limitation is quite difficult to avoid because that is the way most stress measurements are designed. This study selected the second to third month of the second semester to collect data to avoid the stressful time of examination at the end of semester. Therefore, the stress status measured should represent the natural level of stress in medical students.

This study did not investigate medical students'

coping mechanisms. However, it was quite clear from the focus-group discussions that the students did not have enough time even to review their study, or enough time for their families and friends. They must also have some time to relax, something that is necessary to help them face their problems effectively. Other factors, such as supportive academic context and relaxed environment, are also important to help students cope better with stress in medical schools.

CONCLUSION:

The time spent in medical school is a stressful life experience. Many medical students experience stress during their training. This study showed that academic problems were a leading cause of stress. There were a lot of things in the academic context that could make students feel stressed. However, although many of these events caused stress, many were still necessary for medical training. Information from this study can be used to develop appropriate prevention and intervention programs for medical students, and also to create a better medical curriculum.

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