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Stress and coping among international medical students at Lithuanian University of Health Sciences (LUHS)

Medicine

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SUMMARY

Author: Mohammed Munir Mohammed

Title: Stress and coping among international medical students at Lithuanian University of Health Sciences (LUHS)

Aim: To explore the nature of stress, coping and gender differences among international medical students at Lithuanian University of Health Sciences (LUHS).

Objectives:

1. To measure stress severity among international medical students of LUHS.
2. To asses the cause of stress and factors affecting it among the international medical students of LUHS.
3. To measure coping of stress among the international medical students of LUHS.
4. To investigate the gender differences in stress severity, sources and factors, and coping of stress.
5. To provide the university with the results and conclusion of the research work.

Methodology: A cross-sectional study was conducted among 120 international students of LUHS from all years of study of medical faculty. Stressed was assessed by using global rating of stress. Sources of stress is assessed by using MSSQ. Coping strategies are assessed by using Brief COPE.

Study participants: International medical students of LUHS.

Results: A total of 120 students, male was 54,2%. Perceived stress was 54,2%. Most stressful year was 3rd year (65%), followed by 5th year (60%). 52,3% male and 56,4% female reported suffering from stress. Test/examination, heavy workload, need to do well, teach – lack of teaching skills, and large amount of content to be learnt were the top stressors. Planning, active coping, acceptance, positive reframing, and self-distraction are most common used coping strategies. No statistically significant difference was among genders in perceived stress. There was a significant difference between the genders among 8 stressors and 6 coping strategies.

Conclusions: More than half of the international students in LUHS suffered from academic stressed. Focus should be on reducing the sources of stress. A stress management program should be added to the medical program. Also a need to bring about academic changes in the teaching quality.

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CONFLICT OF INTEREST

The author reports no conflicts of interest.

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DĖL PRITARIMO TYRIMUI

LSMU Bioetikos centras, įvertinęs (MA) vientisųjų studijų programos – MEDICINA VI k. stud. Mohammed Munir Mohammed (mokslinio darbo vadovas: prof. Benjaminas Burba, LSMUL KK Psichiatrijos klinika) mokslinio-tiriamojo darbo temos: „Stree and coping among international medical students at Lithuanian University of Health Sciences (LUHS)“ tiriamojo darbo anotaciją, tiriamojo asmens informavimo formą, tiriamojo asmens sutikimo formą ir anketą, kurie leidžia spręsti, jog planuojamame tyrime neturėtų būti pažeistos tiriamojo teisės, todėl šiam tyrimui pritariama.

Bioetikos centro vadovo pavaduotojas doc. E. Peičius

ABBREVIATIONS LIST

1. Lithuanian University of Health Sciences (LUHS)
2. Medical Students Stressor Questionnaire (MSSQ)
3. Problem Based Learning (PBL)
4. Non-Problem Based Learning (Non-PBL)
5. Standard Deviation (SD)
6. Minimum (Min)
7. Maximum (Max)

INTRODUCTION

The universities around the world are responsible for their students to acquire knowledge and skills that are required for professional future responsibilities. With the medical program that is used to train the students, there are some negative consequences that can affect the students both physically and psychologically. [1] The academic stress has been an interesting topic throughout many years, particularly among university students. [2]

Stress especially among medical students has been noted in many countries around the world. [1-5] Already since the beginning of the training process, the medical student experience stress. [1] Studies about stress and coping among medical students have been done in countries such as Bangladesh, Saudi Arabia, Malaysia, and India. [1-5]

Academic stress is not the only stressors which affect medical students, but also time pressure, social adjustment, especially adjusting to the university life while separating from family and friends. In addition to that, concern about the future, tests, grades, financial problems. [2]

Stress can cause problems for health, both psychological and physical. [1] Thus, it is necessary to understand the stressors among the medical students, and the ways of coping. This gives the university, LUHS, a better aspect view of the stress among the students, and how to prevent the stress for future initiatives to safeguard the wellbeing of students. [1]

The study is designed to collect sufficient amount of information about the prevalence of stress, the causes of stress, and coping of stress among the international medical students. All are done by usage of questionnaires that are specific designed for each topic area.

The aim of this study is to explore the nature of stress, coping and gender differences among international medical students at Lithuanian University of Health Sciences (LUHS). The study is aimed to ask the students themselves for their perceptions of stress and coping of stress, in order to better understand the causes of stress during the 6 years' medical program, and to inform initiatives to safeguard the wellbeing of students by decreasing the stress levels of present and future undergraduates.

AIM AND OBJECTIVES OF THE THESIS

Aim: To explore the nature of stress, coping and gender differences among international medical students at Lithuanian University of Health Sciences (LUHS). The study is aimed to ask the students themselves for their perceptions of stress and coping of stress, in order to better understand the causes of stress during the 6 years' medical program, and to inform initiatives to safeguard the wellbeing of students by decreasing the stress levels of present and future undergraduates.

Objectives:

1. To measure stress severity among international medical students of LUHS.
2. To asses the cause of stress and factors affecting it among the international medical students of LUHS.
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LITERATURE REVIEW

Stress in general can be a cause of many problems, both physically and psychologically. Many studies have been done regarding the stress among students, especially medical students. Many were done for the same manner; to understand the underlying stressors, and to safeguard the wellbeing of students. [10-13]

Stress is difficult to define, but we can say that it is the "wear and tear" our bodies experience as we adapt to our frequently changing environment. [10] It can also be described as a situation where the environmental requirements or demands exceed the effectiveness capacity of an individual to give an effective response. [2] Simply when the pressure exceeds a person's ability to cope, by then stress occur. [10]

During stress, hormones are released to prepare the body, also there is an increase in heartbeat and blood pressure. Resulting more blood sent to the heart and major muscles, away from “less important” regions in the body, such as digestive system (Thus, the feeling of nausea during stress).

The physical and psychological effects of stress can affect and create positive or negative influences. Positive influences would be such as a trigger which can help to compel an action. [1,10] Negative influences would result symptoms and feelings of depression, anger, rejection, burnout, and even suicide thoughts. [7-8,10-12] Those symptoms may lead to other health problems such as sleep disturbances, cynicism, headaches, high blood pressure, and stroke. [10,13] The emotional and sleep disturbance is connected with the decrease of well-being. Leading to affection on the daily life and work capacity, which in turn decreases the energy of the student and engagement with academic demands. Those disturbances also intensify the sensitivity to stressful experiences of medical studies. [13] Not only that, due to stress leads to burnout. Study was made showing that burnout seems to be linked with an increased possibility of serious thoughts of dropping out. [14] Furthermore, as result of the emotional distress, the student might develop different effects including stress-induced disorders and deteriorating performance, leading to a negative impact on the students learning ability and cognitive function, resulting mental and physical problems, and may weaken the sense of worth and might affect the academic achievement. [11,15] This is due to that the fact that stress can decrease attention, reduce concentration, have an impact on decision making, and decrease the ability of the student to establish good relation with patients. Resulting, the feeling of being inadequate and unsatisfied with their future clinical practice as doctors and affect the quality of patient care. [16-17]

Stress has also been linked to decreased empathy and academic dishonesty. [25] Studies have been shown that the mental health of the students worsens after the beginning of the medical studies and persist reduced throughout the studies. [7-8,15]

Perception of stress is also important, meaning, one could report suffering of very small amount of stress but still believe it to have a big impact on their health. [18] Study showed that high amount of stress and perception that it could affect their health might be on a greater risk of premature death by 43%. This could be due to the effect between the amount of stress and perception on health together with the individual’s negative expectations, and locus of control concerning health. [18] Also, a study showed that negative thinking has a direct relationship with anxiety. [26]

A cross-sectional study was made in Bangladesh, where MSSQ was used to evaluate stress and sources of stress. [1] It was conducted on a total of 990 medical students from two public and six private medical universities in Bangladesh. The stress prevalence was 54%, 53% male and 55% female, and higher stress level in the public medical university. 54% of students were suffering of stress in third year, while fourth year 55%. Top five stressors were Test/examinations, large amount of content to be learnt, lack of time to review what have been learnt, heavy workload, and verbal or physical abuse by teachers. Those stressors were reported causing moderate to high stress among the medical students. [1]

In Malaysia, another study using MSSQ was also conducted on medical students of University Sains Malaysia. [3] The stress prevalence was 29,6%, where it was highest in second year (36,5%), followed by fourth (35,3%) and third year (31,4). Out of all the factors, such as gender, study year, ethnicity, religion, and grades, year of study was the factor most significantly associated with medical student's stress. The top stressors in this study were tests/examinations, large amount of content to be learnt, lack of time to review what have been learnt, getting poor marks, and need to do well (self-expectation), in other words, academic related problems. [3]

Coping strategies can effect people's health related behaviors, thus they are very important. [27] Individuals who use problem-focused coping strategies tend to not have substance use problems, such as smoking or drinking. While the individuals who use avoidant coping strategies, are more likely to have these problems. [27] Muller and Spitz showed that active coping strategies are negatively linked with stress, while avoidant coping strategies are positively linked with stress. [27]

At King Saud bin Abdulaziz University for Health Science, in Riyadh, Saudi Arabia, a study was made in aim to identify sources of stress among their medical students, and to determine the coping strategies used by the students. [2] Almost 53% of the students felt stressed, and 32,1% felt that they could not cope with stress. More than 82% found studying is stressful, while 64,3% were not sleeping well, and 57,1% were stressed by interpersonal conflicts. The study also showed that female medical students had higher specific stressor score compared to male medical students. [2] The study used Brief COPE to determine the coping strategies among the students. Most applied coping strategies were blaming oneself and being self-critical, seeking advice and help from others, and finding comfort in religion.

Even though the female students were more stressed than males, they tend to use more coping strategies than male students. The study recommended that there should be more attention paid to improve the methods of teaching and the quality of study environment. [2]

In another study, where Brief COPE was used with the aim to examine stress, coping and gender differences in final year medical students. [4] The study was conducted on 117 final year medical students at Kasturba Medical College, Manipal University, in Karnataka, India. 45,9% reported mild stress, and 49,5% moderate stress. Academic performance and professional identity were the top stressors. While in coping, planning, active coping, acceptance, and self-distraction were the most frequently used coping strategies. Also, there were no gender differences in stress. In coping of stress, female students used more emotional coping strategies more than male students. The study concluded that the findings in the study pointed towards a need of stress management program with coping skills training. [4]

A cross-sectional study with an aim to assess the perceived sources of stress and coping strategies among the medical students at the Management and Science University in Malaysia, found that 46% of the 376 medical student who were participated in the study felt stress. [5] Worries of the future and financial difficulties were the the most common stressors. The study used Brief COPE scale, where active coping, religious coping reframing, planning, and acceptance were the top strategies used to cope stress among the students. The study concluded that the main stressors were mainly financial and academic related. The students used active coping strategies rather than avoidance, and they should receive consultation on how to cope and manage stress. [5]

Brief COPE scale was also used in a cross-sectional study in Nepal. [6] The study was made to identify the sources of stress, their severity and coping strategies. The results showed that most common stressors were academic and psychosocial related. Most important and also most severe stressors were staying in hostel, high parental expectations, vastness of syllabus, and test/exams. By using Brief COPE, most common used cope strategies were positive reframing, planning, acceptance, active coping, and self-distraction. [6] As conclusion, advisors may train the students to cope and manage stress. Also they conclude that there is a need to bring academic changes in evaluation system and quality of teaching. [6]

A study conducted among Canadian medical students, concluded that are neither tougher nor better at coping stress than their peers in the population. [9] Mostly to emphasize the importance of stress management during the medical studies, whether by integration into the curriculum or informal mentorship. [9]

The medical program in LUHS is problem-based learning (PBL) during second and third year. [19] In a study conducted in UK, a comparison of course-related stressors between PBL and non-PBL medical programs, showing that there are significant differences in the perceived course-related stressors affecting the students. [20] There were significantly more students on the PBL program felt that they did not know what the faculty expected of them. The study stated the this could be due to a lack of clearly defined limits of what is needed to be learned, which results doubt to the depth of learning required. That could lead to lack of confidence in the student about whether that they have learnt inadequate or in excessive amount. [20] Helping students with coping and managing stress was also recommended in this article. Thus, to ensure the optimum learning and wellbeing among the medical students. [20]

RESEARCH METHODOLOGY AND METHODS

This cross-sectional survey study was conducted in Lithuanian University of Health Sciences (LUHS) using an anonymous self-administered questionnaire. The study was carried out during December, 2015 among the international students of the medical faculty. The object of the study included only the international students of the medical faculty. The study was conducted on 20 randomly selected international medical students from each year 1-6 (120 students in total). The study was enrolled after clearance was obtained from the university and ethical committee.

The questionnaires were self-administered questionnaires which were distributed to the students during face-to-face sessions in a lecture hall. The distribution was done separately according the the year of the study. Introduction and explanation was given to the students, and they were told to follow the instructions.

The process of filling the questionnaires took about 15-20 minutes for each year to complete. The questionnaires were then collected on the same day, after completing filling. The completion of the questionnaires was voluntary and anonymous. It would not affect their study progress on their medical course. Written informed consent forms were distributed to the students together with the questionnaires. Those who signed and agreed were the only students whom were enrolled in the study.

The questionnaires were comprised of three parts: (i) socio-demographic questions together with a question about rating of stress of the student at the moment, (ii) questions that are designed to to obtain information about the sources and levels of stress, and (iii) questions that are designed to obtain information about coping of stress. The socio-demographic questions included gender, study year, relationship, smoking, and drinking alcohol. The level of stress is measured through the student's rate of the stress by answering one of the follows, "Not at all", "A little bit", "I have stress", and "I have too much stress". The perceived stress here was split into 2 categories: "Not at all" and "A little bit" was considered as "no perceived stress", and "I have stress" and "I have too much stress" was considered as "Perceived stress".

In this study, a newly developed instrument was used, the Medical Students Stressor Questionnaire (MSSQ). [21] It is an instrument that is used to identify sources of stress. There are 40 item on MSSQ, representing 40 events. Those events have been reported as probable sources of stress in medical students. The respondents were asked to respond to each event by rating the event in themselves during the recent weeks. The rating is done by choosing from five responses: 'causing no stress at all', 'causing mild stress', 'causing moderate stress', 'causing high stress', and 'causing severe stress'. MSSQ is scored by giving a value of 0-4 for each response of each event. A respond of 'causing no stress at all' would be scored as 0, and 'causing severe stress' would be scored as 4. [21] The internal consistency of this questionnaire as indicated by the Cronbach's alpha value was 0,95.

To assess the coping strategies, Brief COPE scale was used. Brief COPE is an abbreviated version of the COPE Inventory [22]. It is used to assess different coping behaviors. [22] Brief COPE consists of 28 items. Each item on the scale is rated on a 4-point Likert scale. The rating was, '1 = I haven't been doing this at all', '2 = I've been doing this a little bit', '3 = I've been doing this a medium amount', and '4 = I've been doing this a lot'. Higher score indicates greater coping by the respondents. The items produced 14 dimensions, 2 items for each dimension. Each dimension reflected the use of a

specific coping strategy, including: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. [22] Cronbach's alpha values 0,87 for the scale, while the Cronbach's alpha for the coping strategies separately range between 0,50-0,84, with only one coping strategy falling below 0.60.

Data were analyzed using IBM SPSS Statistics Version 23.0 (IBM Corporation, New York, USA). Percentage frequencies of occurrence for each socio-demographic variable and perceived stress variables. Recode into different variables was used for perceived stress, then the data was analyzed by frequencies. Descriptive statistics was calculated for stressors, and they were ranked by the highest mean degree. Coping strategies were made by recode into different variables, where 14 coping strategy variables were made and calculated with descriptive statistics. Cross tabs together with chi-square test was done for comparing the socio-demographic variables with perceived stress. Independent Samples Mann-Whitney U test was done for stressors and coping strategies.

RESULTS

Socio-demographic characteristics

A total of 120 medical students responded, 65 (54,2%) of which were male and 55 (45,8%) female students. All years were equally divided; 20 students from each year. 72 (60%) students were single, while 48 (40%) were engaged. Majority of students did not smoke (75,8%). 83 (69,2%) students answered 'Yes' to drinking alcohol. Complete results of socio-demographic characteristics are shown below in Table 1.

Table 1: Socio-demographic characteristics of participants

Variables		**Number**	**Percent (%)**
Gender	Male	65	54,2
	Female	55	45,8
Relationship	Single	72	60
	Engaged	48	40
Smoking	Yes	29	24,2
	No	91	75,8
Alcohol	Yes	83	69,2
	No	37	30,8

Total number of participants = 120.

Perceived stress among the international medical students

There were 50 students (41,7%) who reported having stress, whereas 39 students (32,5%) reported that they have felt a little bit of stress. 16 students (13,3%) reported not having stress at all, and only 15 students (12,5%) reported that they have too much stress (Table 2).

Recode into different variables was used, where the four variables were split into two categories, 'Perceived stress' and 'No perceived stress'. 'Not at all' and 'A little bit' were recode as 'No perceived stress', whereas 'I have stress' and 'I have too much stress' into 'Perceived stress'. After that, descriptive statistics were used to count the number and percentage among the two new groups. 65 students (54,2%) perceived stress, while 55 students (45,8%) had no perceived stress (Table 3).

Among the socio-demographic factors, none of the factors was significantly associated with stress. Also, no significant difference of perceived stress found between males and females (Table 6).

Among the distribution of the study years, the prevalence of perceived stress for for first, second, third, fourth, fifth, and sixth were 40%, 50%, 65%, 55%, 60%, and 55%, respectively. The highest prevalence of perceived stress was observed among third and fifth year students. The prevalence of perceived stress was at an intermediate level and the same among both fourth and sixth year students. First and second year had the lowest level of prevalence of perceived stress.

Table 2: Perceived stress among students.

Stress	**Number**	**Percent (%)**
Not at all	16	13,3
A little bit	39	32,5
I have stress	50	41,7
I have too much stress	15	12,5
Total	*120*	*100*

Frequencies was used for data analysis. Total number of participants = 120.

Table 3: Perceived stress after grouping into 2 groups

Stress	**Number**	**Percent (%)**
Perceived stress	65	54,2
No perceived stress	55	45,8
Total	*120*	*100*

Recode into different variables was used, then data was analyzed by frequencies.
Total number of participants = 120.

Sources of stress among the international medical students

Sources of stress are ranked according to the mean degree of stress perceived by medical students, are shown in Table 4. The most significant sources of stress reported by students were academic related which caused moderate to high stress, those included tests/examinations with score (SD) of 2,64 (0,98), heavy workload 2,11 (1,19), and need to do well (self-expectation) 2,09 (1,22). Following the top three stressors are those sources of stress which caused mild to moderate stress, and they accounted as 80% of the total stressors. Those included, teacher – lack of teaching skills 2,00 (1,09), large amount of content to be learnt 1,99 (1,18), and lack of time to review what have been learnt 1,99 (1,12). The least important stressor was working with computers 0,38 (0,66), which was included in the same category as those stressors which caused none to mild stress. Among male students, the top sources of stress were tests/examination 2,50 (0,95), heavy workload 2,06 (1,22), teacher – lack of teaching skills 2,00 (1,10), lack of guidance from teacher(s) 2,00 (1,05), and need to do well (self-expectations) 1,97 (1,35). Whereas among female students, tests/examinations 2,76 (1,00), not enough study material 2,29 (1,23), need to do well (self-expectation) 2,24 (1,04), lack of time to review what have been learnt 2,20 (1,10), and heavy workload 2,16 (1,67). Working with computers was the least important stressor among male and female students.

A significant difference between males and females found in eight stressors (Table 7). This was found after receiving results of Mann-Whitney U test, which was performed for the data analysis. The result showed that female students tend to be more stressed for those stressor more than male students. The stressors included, Verbal or physical abuse by other student(s), not enough study material, conflict with personnel(s), inappropriate assignments, poor motivation to learn, lack of time to review what have been learnt, verbal or physical abuse by teacher(s), and frequent interruption of my work by others.

Table 4: Stressors (identified by MSSQ) ranked by mean degree of stress perceived by medical students.

Rank	Items	*Degree of stress mean	SD
Causing moderate to high stress			
1	Tests/examinations	2,64	0,98
2	Heavy workload	2,11	1,19
3	Need to do well (Self-expectation)	2,09	1,22
Causing mild to moderate stress			
4	Teacher - lack of teaching skills	2,00	1,09
5	Large amount of content to be learnt	1,99	1,18
6	Lack of time to review what have been learnt	1,99	1,12
7	Not enough study material	1,98	1,24
8	Lack of guidance from teacher(s)	1,95	1,03
9	Not enough medical skill practice	1,90	1,12
10	Unjustified grading process	1,88	1,16
11	Quota system in examinations	1,88	1,10
12	Lack of time for family and friends	1,83	0,90
13	Getting poor marks	1,81	1,13
14	Falling behind in reading schedule	1,77	0,86
15	Uncertainty of what is expected of me	1,73	1,10
16	Unable to answer the questions from the teachers	1,71	0,96
17	Not enough feedback from teacher(s)	1,69	1,11
18	Unable to answer questions from patients	1,68	1,04
19	Feeling of incompetence	1,64	1,17
20	Frequent interruption of my work by others	1,57	1,01
21	Lack of recognition for work done	1,52	1,30
22	Having difficulty understanding the content	1,50	0,95
23	Family responsibilities	1,43	1,05
24	Learning context - full of competition	1,38	0,96
25	Need to do well (imposed by others)	1,36	1,04
26	Poor motivation to learn	1,28	1,22
27	Inappropriate assignments	1,25	0,85
28	Conflict with personnel(s)	1,23	1,10
29	Conflict with teacher(s)	1,23	1,20
30	Facing illness or death of the patients	1,19	1,26
31	Verbal or physical abuse by teacher(s)	1,14	1,36
32	Participation in class presentation	1,11	1,11
33	Participation in class discussion	1,11	1,02
34	Parental wish for you to study medicine	1,03	1,25
35	Conflicts with other students	1,02	0,95
Causing none to mild stress			
36	Talking to patients about personal problems.	0,96	0,97
37	Verbal or physical abuse by other student(s)	0,75	1,08
38	Verbal or physical abuse by personnel(s)	0,72	0,97
39	Unwillingness to study medicine	0,56	1,04
40	Working with computers	0,38	0,66

*Degree of classification: 0-1,00 'causing none to mild stress', 1,01 - 2,00 is 'causing mild to moderate stress', 2,01 - 3,00 is 'causing moderate to high stress' and 3,01 - 4,00 is 'causing high to severe stress'. Data were analyzed by using descriptive statistics. Total number of participants = 120.

Coping strategies used by the international medical students

The coping strategies in this study are ranked according to the mean degree of coping of stress (Table 5). The students in this study used strategies such as planning, with score (SD) of 5,22 (1,73), active coping 5,18 (1,66), Acceptance 5,00 (1,72), positive reframing 4,98 (1,80), and self-distraction 4,69 (1,80). Least used strategy was substance use 2,65 (1,31). Among male students, the most common used coping strategies were planning 5,12 (1,89), active coping 5,06 (1,72), acceptance 4,90 (1,71), positive reframing 4,65 (1,82), and self-distraction 4,29 (1,79). Among female students, positive reframing 5,36 (1,71), active coping 5,33 (1,59), planning 5,33 (1,55), self-distraction 5,16 (1,70), and acceptance 5,11 (1,74). The least used coping strategy among both genders was substance use.

Using Mann-Whitney U test, as shown in Table 8, few coping strategies were significantly different used by the male and female students. Females tend to use self-distraction, emotional support, instrumental support, venting, and positive reframing more than the male students. Whereas the male students tend to use religion more than female students.

Table 5: Coping strategies ranked by mean degree of coping of stress by medical students.

Rank	Coping strategy	Mean	SD
1	Planning	5,22	1,73
2	Active coping	5,18	1,66
3	Acceptance	5,00	1,72
4	Positive reframing	4,98	1,80
5	Self-distraction	4,69	1,80
6	Humor	4,31	1,64
7	Use of instrumental support	4,30	1,61
8	Use of emotional support	4,21	1,67
9	Self-blame	4,17	1,79
10	Venting	4,08	1,52
11	Religion	3,57	1,74
12	Behavioral disengagement	3,17	1,47
13	Denial	2,96	1,36
14	Substance use	2,65	1,31

Data were analyzed by using descriptive statistics. Total number of participants = 120.

Table 6: Difference and significance of perceived stress according to gender.

Gender		Stress		Total
		Perceived stress	No perceived stress	
Male	Count	34	31	65
	% within Gender	52,3%	47,7%	100,0%
Female	Count	31	24	55
	% within Gender	56,4%	43,6%	100,0%
Total	Count	65	55	120
	% within Gender	54,2%	45,8%	100,0%
Pearson Chi-Square:		0,657		
Odds Ratio:		0,849		

Data were analyzed using chi-square test. Significant if p <0,05. Crosstabs was performed. Total number of participants = 120.

Table 7: Significant stressors between genders.

Item	Gender	Mean	SD	Min	Max	25th Percentile	50th Percentile (Median)	75th Percentile	p sig (Mann-Whitney)
Verbal or physical abuse by other student(s)	Male	0,54	0,94	0	4	0	0	1	0,13
	Female	1,00	1,19	0	4	0	1	2	
Not enough study material	Male	1,71	1,20	0	4	1	2	2,5	0,08
	Female	2,29	1,23	0	4	2	2	3	
Conflict with personnel(s)	Male	1,06	1,12	0	4	0	1	2	0,36
	Female	1,44	1,05	0	4	1	1	2	
Inappropriate assignments	Male	1,11	0,81	0	3	1	1	2	0,47
	Female	1,42	0,88	0	3	1	1	2	
Poor motivation to learn	Male	1,06	1,25	0	4	0	1	2	0,14
	Female	1,53	1,15	0	4	1	2	2	
Lack of time to review what have been learnt	Male	1,82	1,12	0	4	1	2	3	0,42
	Female	2,20	1,10	0	4	1	2	3	
Verbal or physical abuse by teacher(s)	Male	0,86	1,25	0	4	0	0	1	0,07
	Female	1,47	1,43	0	4	0	1	3	
Frequent interruption of my work by others	Male	1,38	0,93	0	4	1	1	2	0,48
	Female	1,78	1,07	0	4	1	2	2	

Independent-Samples, Mann-Whitney U test was performed. Only stressors with significant association are shown. Total number of participants = 120.

Table 8: Significant coping strategies

Item	Gender	Mean	SD	Min	Max	25th Percentile	50th Percentile (Median)	75th Percentile	p sig (Mann-Whitney)
Self Distraction	Male	4,29	1,79	2	8	3	4	5	0,05
	Female	5,16	1,70	2	8	4	5	7	
Emotional support	Male	3,80	1,55	2	8	2,5	4	5	0,04
	Female	4,69	1,69	2	8	3	4	6	
Instrumental support	Male	4,00	1,59	2	8	3	4	5	0,015
	Female	4,65	1,58	2	8	4	4	6	
Venting	Male	3,72	1,63	2	8	2	3	5	0,01
	Female	4,51	1,27	2	7	3	4	6	
Positive reframing	Male	4,65	1,82	2	8	3	4	6	0,027
	Female	5,36	1,71	2	8	4	5	7	
Religion	Male	3,88	1,80	2	8	2	4	5	0,29
	Female	3,20	1,60	2	8	2	2	4	

Independent-Samples, Mann-Whitney U test was performed. Only coping strategies with significant association are shown. Total number of participants = 120.

DISCUSSION OF THE RESULTS

This study found that 54% of the student was suffering of stress, whereas 56,4% of female students reported as stressed, and 52,3% of male students. Similar result was found in a cross-sectional study made in Bangladesh. [1] In that study, the stress prevalence was 54%, 55% female and 53% male. Also, 3rd year students had highest prevalence of stress, which is the same as in this current study. [1] In a study made in Saudi Arabia, 53% felt of the students felt stress, and also reported that female students tend to be more stressed than male students, which is also similar. [2] Those levels of stress are in comparison to that stress level of general population. [3] While in Malaysia, a study found that the stress prevalence among their students was 29,6%, and it was highest among their 2nd year students. [3] The differences in the results between this study, those studies with similar results, and in Malaysia, could be due to that they have different approaches toward management of stress, by enhancing the personal development of the students so that they are able to cope with stress. [3] Also, the amount of stress can be as an indication for a change in the curriculum to achieve a lower level of stress among the medical students. It is also worth emphasizing that excessive stress could have negative influence on health, physically and psychologically. [7-8] Thus, it is important to identify and eliminate the stressors, to prevent long-term effects. [10-13]

Third and fifth year were found as the most stressful years of the medical program in this study. This might be due to the heavy workload and examinations that were reported in top stressors (Table 4). Due that third is is the last year of the pre-clinical studies [19], and students might also have the pressure of doing well and have higher self-expectation before starting the clinical years. While fifth year students for instance, they might have a high self-expectation due to the fact of knowledge mixed with the heavy stress of tests. First year students usually have a problem due to the transitional into 'tertiary' level education. [1] But in LUHS, first students are starting the study year with an introduction course. This is probably one of the reasons they have a lower stress level than other years, but maybe also that the study program is also more different than the other years. [19] Another reason could be that the students have just been entered to the medical 3 months prior and may still need time to face difficulties. 6th year students were also among the lowest in this study, and this could be due to that they have developed skills to cope with stress better.

Top stressor in this study were academic related including tests/examinations and heavy workload, but also need to do well (self-expectation), teacher – lack of teaching skills, and large amount of content to be learnt. Similar results were found in other studies. [1,3,25] It is also interesting to observe that' teacher - lack of teaching skills' is among top five sources of stress (Table 4). This should be improved by the authorities, since it was not listed in the top stressors among the other studies. [1,3]

This study found that top five coping strategies used by the students were mostly active coping (planning, active coping, acceptance, and positive reframing). While the fifth one was self-distraction, which is an avoidant strategy. It is a positive sign that most common used strategies are active coping. But again, one avoidant strategy is among the top five, which is considered as risk factor for adverse responses to stress. Certain emotional and avoidance coping strategies were found to have negative effect were they expect stress in various areas. [4] Similar results were reported in studies conducted in India, Malaysia, and Nepal. [4-6] The other study which was conducted in Saudi Arabia reported quite different results from this study. [2] The most applied coping strategies were blaming on self and being self-critical, seeking advice and help from others, and finding comfort in religion. [2] Substance use is the least used coping strategy in this study, and similarity was reported in the other studies. [2,5] While the medical students in United Kingdom used substance use as a common coping strategy. [23-24]

Even though the female students were more stressed than male students, there was a difference where they tend to use more coping strategies than male students (Table 8). Similar results were found in other studies. [2,4] They tend to seek emotional and instrumental support more than male students, which was also found in the female students at Kasturba Medical College in India. [4] Male students tend to use religion is coping strategy more than female students in this study.

Further studies of stress, sources of stress, and coping strategies should be made based on the ground results of this cross-sectional study on a larger sample of students. Perceived stress, sources of stress, and coping strategies were self-reported by the students. That might have resulted in some reporting bias. Students may have exaggerated or underreported because of fear being singled out.

CONCLUSIONS

Based on the results and findings of this study, there is a need for stress management program and it is possible to conclude:

1. Stress is common among the medical students, where a bit more than half of the students suffered of stress. The highest prevalence of perceived stress was found among the students of third and fifth year. While the first year students suffered the least of perceived stress. Female students tend to suffer more of stress than male students.
2. Academic stressors were the most common sources of stress, as they were found on the top of the list of stressors on the MSSQ scale. They tend to cause moderate to high stress among the students. The students reported that tests and examinations caused them most stress, while working with computers was reported as the item which caused least stress.
3. Coping strategies were assessed by usage of Brief COPE. Students tend to use active coping strategies rather than avoidant strategies as a coping mechanism of stress. Planning and active coping were reported as the most common used strategies among the medical students. Usage of substances such as alcohol and smoking to cope with stress was reported as the least used coping strategy.

4. The difference of perceived stress between the genders was not statistically significant, even though female students reported that they suffered of stress more. Significant differences in stressor were, that female students tend to be more stressed to verbal and physical abuse from both students and teachers, conflict with personnel, or when be given inappropriate assignments, causing either mild or moderate stress. While in coping strategies, females uses emotions more than males, or usage of avoidant strategy where they distract themselves from the problem. But they tend to use some active coping mechanisms more than males. Males tend to use religion as a coping strategy more than females, this would involve praying or meditating.

The results of this study can be used as a baseline for further studies, which can be exploring the issues in more depth.

PRACTICAL RECOMMENDATIONS

Knowing the sources of stress and coping strategies among the students will help the lecturers, and the university counselors to monitor and control those factors. This can be approached by reducing or eliminate the most common sources of stress, and by giving guidance and teaching the students how to control the stress. Workshops can be included in the curriculum, helping the students to know what to expect in their future time of the studies, consequences of stress, educate them about different coping strategies, and how to cope with stress. Students should construct an effective time management plan for studying and desired activities, to keep their life balanced and have healthy well-being.

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