Perception of stress, anxiety, depression and coping strategies among medical students at Oman Medical College

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Abstract

Objective: To explore the stress sources, prevalence of anxiety and depression and coping strategies among preclinical and clinical under graduate medical students.

Methods: A cross sectional study was conducted on Oman Medical College Students of pre-clinical and clinical years. Data was collected using Medical Student Stressor Questionnaire (MSSQ), Hospital Anxiety and Depression scale (HAD) and COPE questionnaire. Statistical analysis was performed using SPSS (IBM SPSS Statistics 20.0).

Results: A total of 288 participants were enrolled in which 123 were pre-clinical and 165 were clinical medical students. Nearly two thirds (78.1%) of students were aged between 20-24 years. Among all 87.5% (252) were females and 12.5% (36) were males. Collective score of academic stress factors in the pre-clinical group was not statistically different ($p = 0.865$) to the clinical group. There was no significant difference (P: 0.826; 95% CI: -3.511-2.804) in the mean score of pre-clinical and clinical group regarding Social Stress factors. Coping strategies to control stress score in the pre-clinical group was statistically significantly ($p < 0.001$) higher than the clinical group.

Conclusion: The higher level of stress is associated with poor academic performance, large content of study material, exam and time constraints. Coping strategies in students were mainly better time management, emotional support, talking to family members/friends helps and good sleep relaxes them to control stress.

Key words: Stress, coping stress, medical students, anxiety, depression

Background

The goal of medical education and curriculum is to produce knowledgeable, skillful, competent, safe and professional physicians. Some aspects of medical education training and burden of curriculum may cause some negative effects on medical students' mental and emotional health[1]. Mental health wellbeing plays a significant role in medical student's career development during study and has a significant impact on the long-term health of doctors practicing in different fields of the health care system[2].

Medical education is stressful and demanding. Overwhelming burden of information, and lots of competition to excel makes students anxious, and nervous and with minimal opportunity to relax and recreate [3]. Most students become more active, creative, and productive because of stress as it enables concentration for better performance and energizes the person for hard work. However, stress can cause significant problems in student's careers; prolonged, uninterrupted, unexpected and unmanageable stress is damaging [4]. Stress results when pressure exceeds one's perceived ability to cope; it does not necessarily follow the presence of a potential stressor. Academic stress is a normal, desirable, and beneficial part of our lives that can help one learn and grow. However , stress is associated with depression, drug abuse, anxiety and suicide [5-6]. Studies suggest that student distress subsequently may affect students' care of patients, relationship with faculty and family members, and ultimately it can cause damage to the culture of the medical profession[7-8].

Coping strategies are specific efforts that individuals employ to manage stress, both behavioral and psychological, so they can tolerate, reduce, or minimize stressful events. Previous studies show that coping plays a central role in adaptation to stressful life events[9]. Literature has reported the high incidence of stress in medical students in different parts of the world. The most common stressors among medical students are high parental expectations, frequency of examinations, vastness of academic curriculum, sleeping difficulties, performance in periodic examinations, and worries about the future[10] . Stressors of medical students are generally academic related stressors, interpersonal related stressors, teaching and learning-related stressors, and social related stressors. Therefore, early detection of stressors among medical students may prevent unwanted consequences on their health[11].

Oman Medical College (OMC) offers a seven-year curriculum, leading to the degree of Doctor of Medicine (MD). The College admits students directly after their graduation from secondary school. Students enter a one year General Foundation Program. After successful completion of the General Foundation Program, OMC students enter a six-year MD Program. The MD Program entails two years of premedical science studies, followed by two years of basic biomedical science studies, and culminates in two years of clinical training.

We conducted a study on medical students at Oman Medical College regarding their perception and recognition of stress and coping strategies.

Methodology

A cross sectional study was carried out at Oman Medical College in 2014 -15. Students of pre-clinical and clinical years who consented to participate in the study are included in this survey.

Data Collection Tool/Survey Questionnaire:
Self-administered Questionnaire has 6 Sections:
I. Demography including age, gender, current residence, family residence, family income, family size, father and mothers' education.
II. Academic stress factors :
0 no stress to 4 causing severe stress
III. Social stress factors:
0 no stress to 4 causing severe stress
IV. Coping strategies to control stress :
0= Never done 1=I have not been doing this, 2 = I've been doing this a little bit, 3 = I've been doing this a medium amount, 4 = I've been doing this a lot
V. Physical well being factors including somatic, agitation, habits and chronicity :
from 1-4 Strongly disagree to Strongly agree
VI. Hospital Anxiety and Depression scale (HAD)

Data was collected using Medical Student Stressor Questionnaire (MSSQ) for academic and social stress. This is a validated and reliable questionnaire adopted with permission of the author. A number of studies reported that reliability of six constructs of the Medical Student Stressor Questionnaire (MSSQ) ranged between 0.64 and 0.92, indicating acceptable to high level of internal consistency. Its validity and reliability was established among medical students in different Malaysian medical schools [12-14].
Hospital Anxiety and Depression scale (HAD); the cut-off point of a score of 8 or more for either the anxiety or depression components denote possible anxiety and depression [14]. This cut-off point had a sensitivity of 0.89 and a specificity of 0.75 for the anxiety component and a sensitivity of 0.80 and specificity of 0.88 for the depression component [15].

Coping strategies were assessed using the abbreviated version of the COPE Inventory, a validated and reliable instrument available online [16-17]. It is used to assess a broad range of coping behaviors among adults with or without clinical conditions. It consists of 19 items, and each item is rated on a 4-point Likert scale ranging from "I have not been doing this at all (score 1)" to "I have been doing this a lot (score 4)". The higher score indicates greater coping by the respondents. The items are scored to produce different dimensions of coping each reflecting the use of a coping strategy: active coping, planning, acceptance, denial, self-distraction, use of smoking, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, humor, religion, and self-blame.

The study protocol was approved by the ethical review committee. All students in pre-clinical and clinical years were invited to participate. Participants were enrolled after taking written informed consent. The principal investigator ensured uniformity and two research assistants trained participants how to fill it out. Validation of the questionnaire on small pilot group was also completed. Questionnaires were brought back after being filled out and entered in the database. All questionnaires were included in the study, and there were no missing responses.

Data Analysis

Statistical analysis was performed using SPSS (IBM SPSS Statistics 20.0). Data were expressed in frequencies, mean and percentages. Cross tabulation was performed to determine if there was a relationship between subgroups. The chi-square test for categorical data, t-test and Mann-Whitney test were used to compare differences between the two groups with parametric and non-parametric continuous data for hypothesis testing.

Results

A total of 288 participants were enrolled in which 123 /180 (68%) were pre-clinical and 165/185(89%) were clinical medical students. Nearly two thirds (78.1%) of students were aged between 20-24 years. Among all 87.5% (252) were females and 12.5% (36) were males. Majority of students' family (75.6%) were urban residents and 78.8 % currently resided in the campus accommodation (Table 1).

Table 1: Characteristics of Study Participants

	Total (n=210)	Pre-Clinical (n=123)	Clinical (n= 165)	X^2	*P*-Value
Age				6.826	0.033
<20	50(17.4)	22 (7.6)	28 (9.7)		
20-24	225 (78.1)	100 (34.7)	125 (43.4)		
>25	13 (4.5)	1 (0.3)	12 (4.2)		
Gender				0.894	0.0.344
Male	36 (12.5)	18 (6.2)	18 (6.2)		
Female	252 (87.5)	105 (36.5)	147 (51)		
Family Residence				1.121	0.29
Urban	214 (75.6)	93 (32.9)	121 (42.8)		
Rural	69 (24.4)	25 (8.8)	44 (15.5)		
Current Residence				10.953	0.004
With family	23(8)	16 (5.6)	7 (2.4)		
In campus	227 (78.8)	97 (33.7)	130 (45.1)		
Outside campus	38 (13.2)	10 (3.5)	28 (9.7)		
Father's Education				1.286	0.732
Primary	70(24.3)	27 (9.4)	43 (14.9)		
Secondary	67(23.3)	31 (10.8)	36 (12.5)		
Graduate	58 (20.1)	23 (8)	35 (12.2)		
Post-graduate	93 (32.3)	42 (14.6)	51 (17.7)		
Mother's Education				4.179	0.243
Primary	90 (31.2)	39 (13.5)	21 (10)		
Secondary	90 (31.2)	40 (13.9)	35 (16.7)		
Graduate	73 (25.3)	25 (8.7)	25 (12)		
Post-graduate	35 (12.2)	19 (6.6)	6 (2.9)		
Anxiety	225 (78.1)	99 (34.4)	126 (43.8)	0.701	0.402
Depression	236 (81.9)	98 (34)	138 (47.9)	0.747	0.387

Participants were asked multiple questions regarding academic stress factors. Their answers were coded from 1 to 5 where 1 is not stress and 5 is severe stress. The most frequent responses were high and severe stress (74.3%) during tests/examinations and more than half experienced high or severe stress due to heavy workload (Table 2). Collective score of academic stress factors in the pre-clinical group was not statistically different (p = 0.865) to the clinical group.

Table 2. Student's response on Academic Stress Factors

	No stress	Mild stress	Moderate stress	High stress	Severe stress
Tests/examinations	3(1)	19 (6.6)	52 (18.1)	111 (38.5)	103 (35.8)
Falling behind in reading schedule	12 (4.2)	27 (9.4)	88 (30.6)	86 (29.9)	75 (26)
Large amount of content to be learnt	2 (0.7)	15 (5.2)	58 (20.1)	103 (35.8)	110 (38.2)
Lack of time to review what has been learnt	8 (2.8)	28 (9.7)	54 (18.8)	95 (33)	103 (35.8)
Heavy workload	8 (2.8)	39 (13.5)	83 (28.8)	91 (31.6)	67 (23.3)
Difficulty understanding the content	25 (8.7)	73 (25.3)	90 (31.3)	63 (21.9)	37 (12.8)
Learning context full of competition	17 (5.9)	58 (20.1)	111 (38.5)	69 (24)	33 (11.5)
Unable to answer the questions from the teachers	22 (7.6)	62 (21.5)	92 (31.9)	64 (22.2)	48 (16.7)
Unjustified grading process	36 (12.5)	65 (22.6)	72 (25)	70 (24.3)	45 (15.6)
Getting poor marks	14 (4.9)	43 (14.9)	46 (16)	72 (25)	113 (39.2)
Participation in class presentation/discussion	67 (23.3)	88 (30.6)	64 (22.2)	47 (16.3)	22 (7.6)
Need to do well (imposed by others)	56 (19.4)	74 (25.7)	71 (24.7)	53 (18.4)	34 (11.8)
Feeling of incompetence	60 (20.8)	66 (22.9)	75 (26)	52 (18.1)	35 (12.2)
Unwillingness to study medicine	109 (37.8)	58 (20.1)	58 (20.1)	35 (12.2)	28 (9.7)
Parental wish for you to study medicine	104 (36.1)	57 (19.8)	59 (20.5)	39 (13.5)	29 (10.1)
Not enough feedback/guidance/encouragement from teacher (s)	55 (19.1)	86 (29.9)	85 (29.5)	37 (12.8)	25 (8.7)
Uncertainty of what is expected of me	44 (15.3)	67 (23.3)	94 (32.6)	54 (18.8)	29 (10.1)
Lack of recognition for work done	42 (14.6)	71 (24.7)	87 (30.2)	56 (19.4)	32 (11.1)
Inappropriate assignments	53 (18.4)	76 (26.4)	79 (27.4)	55 (19.1)	25 (8.7)
Lack of teaching skill in teacher	48 (16.7)	76 (26.4)	77 (26.7)	49 (17)	38 (13.2)
Not enough study material	55 (19.1)	83 (28.8)	76 (26.4)	49 (17)	25 (8.7)
Lack of Relevancy of the course to real life	55 (19.1)	55 (19.1)	88 (30.6)	55 (19.1)	35 (12.2)
Language barrier	65 (22.6)	74 (25.7)	67 (23.3)	48 (16.7)	34 (11.8)
Lack of self-assessment	44 (15.3)	74 (25.7)	66 (22.9)	71 (24.7)	33 (11.5)
Education System	35 (12.2)	55 (19.1)	91 (31.6)	64 (22.2)	43 (14.9)

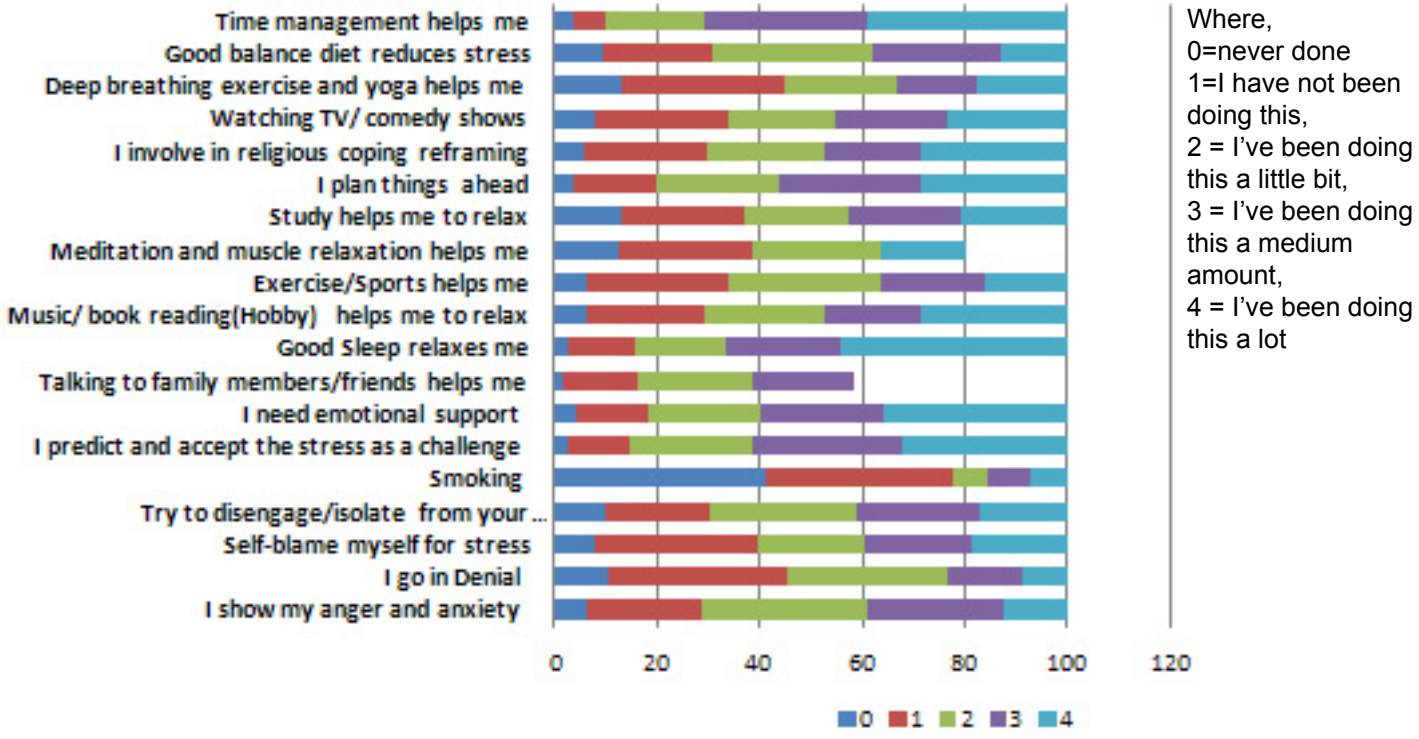
Nearly one third of participants feel mild stress when they need to talk to patients about personal problems and due to lack of time for socialization with friends. More than a quarter (29%) of the participants feel no stress secondary to verbal or physical abuse by other student(s), and 26.2% experienced severe stress due to insufficient time for family (Table 3). There was no significant difference (P: 0.826; 95% CI: -3.511-2.804) in the mean score of preclinical and clinical group regarding Social Stress factors.

Table 3. Student's response on Social Stress factors

	No stress	Mild stress	Moderate stress	High stress	Severe stress
Unable to answer questions from patients	42 (14.6)	56 (19.4)	83 (28.8)	67 (23.3)	40 (13.9)
Talking to patients about personal problems	61 (21.2)	93 (32.3)	81 (28.1)	40 (13.9)	13 (4.5)
Facing illness or death of the patients	47 (16.3)	53 (18.4)	59 (20.5)	67 (23.3)	62 (21.5)
Frequent interruption of my work by others	38 (13.2)	70 (24.3)	74 (25.7)	66 (22.9)	40 (13.9)
Verbal or physical abuse by other student(s)	86(29.9)	60 (20.8)	67 (23.3)	44 (15.3)	31 (10.8)
Verbal or physical abuse by teacher(s)	65 (22.6)	53 (18.4)	67 (23.3)	57 (19.8)	46 (16)
Verbal or physical abuse by personnel	71 (24.7)	61 (21.2)	57 (19.8)	55 (19.1)	44 (15.3)
Conflict with teacher(s) and students	59 (20.5)	73 (25.3)	64 (22.2)	55 (19.1)	37 (12.8)
Lack of time for family	28 (9.7)	56 (19.4)	63 (21.9)	61 (21.2)	80 (27.8)
Lack of time for friends	47 (16.3)	85 (29.5)	68 (23.6)	47 (16.3)	41 (14.2)
Peer pressure	71 (24.7)	61 (21.2)	73 (25.3)	54 (18.8)	29 (10.1)
Problems with friends	99 (34.4)	62 (21.5)	58 (20.1)	48 (16.7)	21 (7.3)
Poor motivation to learn	69 (24)	64 (22.2)	64 (22.2)	51 (17.7)	40 (13.9)
Working with computer	143 (49.7)	58 (20.1)	47 (16.3)	27 (9.4)	13 (4.5)
Financial issues	110 (38.2)	67 (23.3)	49 (17)	36 (12.5)	26 (9)
Health issues	105 (36.5)	52 (18.1)	60 (20.8)	34 (11.8)	37 (12.8)
Challenges of living alone	80 (27.8)	50 (17.4)	52 (18.1)	63 (21.9)	43 (14.9)
Transportation issues	94 (32.6)	50 (17.4)	70 (24.3)	37 (12.8)	37 (12.8)

More than one third of students 38.9%, 36.1%, 41.3% and 44.1% pick out better time management, emotional support, talking to family members/friends helps and good sleep relaxes them to control stress, respectively. Nearly one third of students think plan things ahead (28.8%) and involve in religious coping reframing (28.8%) helped them a lot to cope with stress (Figure 1). Coping strategies to control stress score in the pre-clinical group was statistically significantly ($p < 0.001$) higher than the clinical group.

Figure 1



Students were asked multiple questions regarding health problem descriptions in the past year. Their answers were coded into strongly disagree, disagree, agree and strongly agree. The most frequent health issues are headache, backache, bodyache and lack of appetite. There was not significant difference (p-0.878; 95% CI-1.787-1.529) observed between pre-clinical (Mean-30.66±6.48) and clinical (Mean-20.79±7.79) group score regarding health issues.

Table 4: Health Problems descriptions in the Past Year

Statement		Strongly disagree	Disagree	Agree	Strongly agree
Somatic	Skin rash	161 (55.9)	64 (22.2)	41 (14.2)	22 (7.6)
	Back pain	67 (23.3)	46 (16)	116 (40.3)	59 (20.5)
	Allergic illness (Asthma, rhinitis, etc)	173 (60.1)	59 (20.5)	37 (12.8)	19 (6.6)
	Infectious diseases	146 (50.7)	64 (22.2)	56 (19.4)	22 (7.6)
	Frequent colds	82 (28.5)	79 (27.4)	90 (31.3)	37 (12.8)
	Generalized bodily pains	66 (22.9)	52 (18.1)	109 (37.8)	61 (21.2)
Agitation	Sleep problems	35 (12.2)	46 (16)	104 (36.1)	103 (35.8)
	Headache	35 (12.2)	47 (16.3)	125 (43.4)	81 (28.1)
	Nausea	92 (31.9)	94 (32.6)	69 (24)	33 (11.5)
	Lack of appetite	80 (27.8)	75 (26)	92 (31.9)	41 (14.2)
Habits	Overeating	106 (36.8)	76 (26.4)	72 (25)	34 (11.8)
	Drinking alcohol	241 (83.7)	32 (11.1)	10 (3.5)	5 (1.7)
	Smoking tobacco	235 (81.6)	38 (13.2)	7 (2.4)	8 (2.8)
Chronicity	Chronic illness	208 (72.2)	49 917)	17 (5.9)	14 (4.9)
	Disability that interferes with daily activities	167 (58)	62 (21.5)	36 (12.5)	23 (8)

In the questionnaire, students were asked multiple questions regarding how they have been feeling in the past week (Table 5). Their answers were coded into most of time, a lot of time, occasionally and not at all. The most frequent response was most of time 147 (51%), 106 (36.8%) and 101 (35.1%) for laugh and see the funny side of things, look forward with enjoyment to things and enjoy a good book or program respectively. No significant difference was found between the preclinical and clinical groups on the anxiety and depression scores.)

Table 5: HAD scale

	Most of the time	A lot of time	Occasionally	Not at all
I feel tense or wound up	44 (15.3)	55 (19.1)	150 (52.1)	39 (13.5)
I still enjoy the things I used to enjoy	77 (26.7)	123 (42.7)	63 (21.9)	25 (8.7)
I get a sort of frightened feeling as if something awful is about to happen	54 (18.8)	77 (26.7)	120 (41.7)	37 (12.8)
I can laugh and see the funny side of things	147 (51)	84 (29.2)	46 (16)	11 (3.8)
Worrying thoughts go through my mind	52 (18.1)	72 925)	127 (44.1)	37 (12.8)
I feel cheerful	19 (6.6)	72 (25)	145 950.3)	52 (18.1)
I can sit at ease and feel relaxed	41(14.2)	150 (52.1)	87 (30.2)	10 (3.5)
I feel as if I am slowed down	26 (9)	84 (29.2)	149 (51.7)	29 (10.1)
I get a sort of frightened feeling like butterflies in the stomach	92 (31.9)	113 (39.2)	64 (22.2)	19 (6.6)
I have lost interest in my appearance	31 (10.8)	82 (28.5)	90 (31.3)	85 (29.5)
I feel restless as if I have to be on the move	31 (10.8)	89 (30.9)	138 (47.9)	30 (10.4)
I look forward with enjoyment to things	106 (36.8)	92 (31.9)	79 (27.4)	11 (3.8)
I get sudden feelings of panic	35 (12.2)	88 (30.6)	106 (36.8)	59 (20.5)
I can enjoy a good book or program	101 (35.1)	94 (32.6)	61 (21.2)	32 (11.1)

Discussion

The main goal and objective of medical curriculum is to provide competent and safe doctors to the community however, there are few aspects of medical training which may effect medical students' mental and emotional health . In our study the majority are female students and their families are living in urban areas. More than two thirds of participants are living in a campus hostel. Many studies in the western countries have demonstrated the vulnerability of the medical students to psychiatric disorders [18]. Nearly one third of participants of our study feel mild stress when they need to talk to patients about personal problems and due to lack of time for socialization with friends. They feel stressed due to insufficient time for family as well as facing illness or death of the patient. The majority of studies on stress in medical education focus on the documentation of stress and information on the correlates of stress [19]. (Table I)

Stress and health issues may affect medical students' academic performance. Student's stress may affect care of patients, relationship with faculty, as well as their future learning. Coping strategies are specific efforts that individuals employ to manage stress [20]. Stress among medical students is a great concern as it may effect on behavior of students, inhibition of learning, and ultimately affect patient care in the future [21-22]. (Table 2)

The negative effects of long and tiring medical education on the psychological status of students have been shown in several studies[23-24]. Students in this study have academic stress mainly getting poor marks, large content of study material, exam and time constraints. Similar results are reported in literature, that emotional distress and academic stress is the top most finding in students [25]. Appropriate levels of stress may enhance learning in medical students, however, excessive stress might cause physical and mental health problems, reduced self-esteem, and may affect academic achievement, personal and professional development [26-27]. (Table 3)

In Arab countries, epidemiological research about psychiatric morbidity in medical students is uncommon. Recently performed studies showed high rate of anxiety and depression in undergraduate medical students which is consistent with our findings in this study[28].

Nearly one third of students think plan things a head (28.8%) and involve in religious coping reframing (28.8%) helped them a lot to cope with stress (Figure 1). Coping strategies to control stress score in the pre-clinical group was statistically significantly ($p < 0.001$), higher than the clinical group. Literature shows respecting one's limits, setting priorities, avoiding comparisons and participating in leisure activities are main coping strategies [29-30].

Coping strategies in this study showed that one third of students pick out better time management, emotional support, talking to family members/friends helps and good sleep relaxes them to control stress respectively. As reported in literature the stress management and best active coping strategies are to maintain a well-balanced academic environment for improved learning experience[31]. (Fig I)

Stress can lead to disruptions in both physical and mental health. Self-reported health issues in our studies were headache, backache, body ache and lack of appetite. Stress induced health problems if excessive, might affect academic performance and professionalism of medical students [31-33]. (Table 4)

Stress reduction and adopting a healthier life style have been major concerns of the students that may affect their learning ability and academic performance [34-35]. In our study HAD scale shows significant anxiety level in medical students however, there is no difference in preclinical and clinical students.(Table 5)

Stress can be best managed by regular exercise, meditation or other relaxation techniques, structured time outs and learning new coping strategies to handle stress in medical students [36]. Identifying stress in medical students early in their pre-clinical years and managing appropriately help them in coping with stress in clinical years. This is imperative to get academic achievement by students as well as future doctors' professional development controlling their stress and anxiety [37].

Oman Medical College recognized the importance of students' mental health and emotional integrity. A new service "Counselling Center" managed by the department of Psychiatry and Behavioral Science for students has been established by Oman Medical College in year 2016.

Limitations of the study: This is a cross-sectional study and findings of this study are based on self-reported information provided by students which can have some bias because of respondents' interpretation of the questions.

Conclusion

The study showed a diversity of stress sources and stress in the medical students. The higher level of stress is associated with poor academic performance, large content of study material, exam and time constraints. Coping strategies in students are mainly better time management, emotional support, talking to family members/friends helps and good sleep relaxes them to control stress.

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