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Prevalence of Depression among Medical Students at Taibah University, Madinah, Saudi Arabia

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Abstract

Background: *The medical students are frequently under psychological pressure which makes them more prone to develop physical and mental problems including depression. Few studies investigated its prevalence in Saudi Arabia.*

Objectives: *This study aimed to determine the prevalence of depression and to hypothesize risk factors influencing this problem among Taibah University medical students, Madinah, Saudi Arabia.*

Methods: *A cross-sectional study was conducted at Taibah College of medicine, Madinah, Saudi Arabia. The study recruited all medical students registered during the study year 2013/14. A self-administered electronic questionnaire was completed by 555 students during the month of May 2014. Detailed information was collected from the students through a well designed structured questionnaire including PQ-2 instrument for depression screening. The prevalence of depression was estimated, and appropriate statistical analyses were performed to compare the prevalence by students' characteristics.*

Results: *The response rate was 92.5% (555 out of 600 students). The overall prevalence of depression was 28.3% (95% CI= 24.5%-32.1%). The prevalence was significantly high among male (31.6%) and single students (33.6%). Students reported eating one meal per day, taking energy drinks and use stimulant drugs showed also significant high prevalence. The prevalence was significantly high among students with associated medical problems, particularly back pain (60%), hypertension (55%) and bronchial asthma (47.5%). Sleeping related factors appeared to influence the prevalence of depression among the studied students where prevalence was high among those reported less sleeping hours, use of sleeping medications and those spent > 2 hours in bed before sleeping.*

Conclusion: *The study revealed a considerable high prevalence of depression and hypothesized a variety of influencing factors among the studied medical students. These findings urge the faculty administration to increase awareness among the students and to encourage more studies to implement effective preventive and counseling services.*

Key words: *Depression, Medical students, Prevalence, Saudi Arabia.*

INTRODUCTION

Psychological and mental health problems among university students are considered one of the vital and escalating public health problem worldwide, for which epidemiological data is required and should be addressed as a priority problem (1). Medical education is among the most challenging and stressful ones (2), and several previous studies have shown that medical students experience a high level of stress during their undergraduate course (3-7). High level of stress may have a negative effect on cognitive functioning and learning of students in the medical school (8). Results of studies suggest that mental health worsens after students begin medical school and remain poor throughout the training (3).

The studies conducted on medical students in different regional countries have shown that medical students have high rates of anxiety & depression during their training. El-El-Gilany et al. (9) conducted cross sectional study among male medical students in both Mansoura University, Egypt and King Faisal University in Riyadh, Saudi Arabia, and concluded that anxiety & depression represented a prevalent problem in both countries (9).More recently, another study was conducted on 50 medical students at Faculty of Medicine, King Faisal University, Al Ahsaa Governorate, where the prevalence of stress was 53% among the studied students (10). Other Saudi studies conducted in different faculty of medicine showed similar high prevalence (11,12)

It is recommended to conduct psychological and mental screening of medical students, as they will be tomorrow's physicians (2). As anxiety and depression represent the most important health related problems among medical students (1), and as there are great lack of data about the prevalence of these problems among medical students in Madinah city, Saudi Arabia, there would be an urgent need to conduct epidemiological study to assess the magnitude of this fundamental problem among medical students at Taibah university. The objective of the study was to determine prevalence depression among male and female medical students at Taibah University, Madinah, Saudi Arabia, and to compare students' characteristics by their depression status.

METHODS

Across section study was conducted to determine the prevalence of depression among medical students at Taibah University, Madinah, Saudi Arabia during the study year 2013/14. All the male and female medical students in the five academic years of Taibah College of Medicine (n=600), were invited to complete self-administered electronic mailing, anonymous questionnaire during May 2014. The questionnaire was designed by the research team and it was based on PQ-2 for depression screening questions (13-15). The questionnaire has also included socio-demographic and data related to dietary habit and other lifestyle factors. Sleeping related variables and associated chronic medical problems ware also included in the study questionnaire. The PQ-2 is an ultra short screening instruments, including simple questions inquiring about the frequency of depressed mode and anhedonia over the past two weeks and, and include only the first two items from PHQ-9. The question was as follow: over the past 2 weeks, how often have you bothered by any of the following statements; i) little interest or pleasure in doing things, ii) Feeling down, depressed or hopeless. The PQ-2 score ranges from 0-6 where score 0 indicates "not at all", score 1 "Several days", 2 "more than half the days", 3 "nearly every day". The cutoff score of 3 was used as the optimal cutoff point in this study for screening purpose. It is mentioned that cutoff score of 3 would enhance the sensitivity of PQ-2 questionnaire and improve its specificity (14). The validity of other variables included in the study questionnaire in relation to the studied depression status was obtained from discussions with psychiatrist and an epidemiologist.

The questionnaires were completed and returned back by 555 out of contacted 600 medical students registered at Taibah College of medicine during the study year. The background and purpose of the study were explained at the beginning of the questionnaire.The collected data were entered and analyzed using SPSS package (version 19.0). Data was presented using frequencies, mean and standard deviation as appropriate. The

prevalence of depression among the studied students was assessed, analyzed and compared by all studied students' characteristics using appropriate statistical tests (chi square and Fischer exact tests). *P* values ≤ 0.05 were used as indicators of statistical significance differences between the studied groups. The participation of students was voluntary and ethical considerations were also considered to ensure confidentiality and privacy of the collected data. Finally, approval was taken from the ethics committee at Taibah College of Medicine.

RESULTS

Out of the contacted 600 medical students, 555 students were completed and returned back the study questionnaire with a response rate of 92.5%. The overall prevalence rate of depression among the studied medical students at Taibah University was 28.3% (157/555).

Table 1. Prevalence of depression by socio-demographic data of the studied medical students.

Socio-demographic characteristics		**Depression**				**P value**
		Yes (n= 157)		**No (n= 398)**		
		No.	%	No.	%	
Gender	Male	64	24.05	197	75.5	0.06
	Female	93	31.6	201	68.4	
Academic level	1st	34	29.3	82	70.7	0.29
	2nd	40	33.6	79	66.4	
	3rd	32	31.4	70	68.6	
	4th	26	24.8	79	75.2	
	5th	25	22.1	88	77.9	
Social status	Married	4	10.5	34	89.5	0.01*
	Single	153	29.6	364	70.4	
Living status	Alone	12	33.3	24	66.7	0.49
	With family	145	27.9	374	72.1	
Family income	< 5000	9	30.0	21	70.0	0.7
	5000 – 10000	42	30.9	94	69.1	
	> 10000	106	27.2	283	72.8	

*Significant

Table 1 presents the prevalence of depression among the studied students by their studied socio-demographic factors. The depression was more prevalent among female students, but without statistically significant difference (31.6% among females vs. 24.05% among males). The prevalence of depression was more among 2nd and 3rd academic level students where the prevalence was 33.6% and 33.1%, respectively. A significant high level of depression, however, was found among single students where the prevalence was 29.6% compared to only 10.5% among married students (p= 0.01). The prevalence of depression was also higher among students who reported living alone (33.3%) and those reported monthly family income < 5000 SR (30.0%), and 5000-10000 SR (30.9%), although not statistically significant differences.

Table 2. Comparison between depressed and non-depressed students according to life-style factors.

Lifestyle factors		**Depression**				**P value**
		Yes		**No**		
		No.	%	No.	%	
Fast food per week	None or once	51	27.4	135	72.6	0.87
	2 to 3 times	71	28.1	182	71.9	

	4 to 5 times	23	28.4	58	71.6	
	> 5 times	12	34.3	23	65.7	
BMI	Underweight	12	24.0	38	76.0	0.85
	Normal	93	29.5	222	70.5	
	Overweight	34	27.6	89	72.4	
	Obese	18	26.9	49	73.1	
Soft drinks per week	None or once	53	27.6	139	72.4	0.36
	2 to 3 times	53	29.8	125	70.2	
	4 to 5 times	19	21.6	69	78.4	
	> 5 times	32	33.0	65	67.0	
Number of meals per day	1	15	51.7	14	48.3	0.003*
	2	81	31.6	175	68.4	
	3	48	21.7	173	78.3	
	> 3	13	26.5	36	73.5	
T.V. watching time per day	< 2 hours	58	27.2	155	72.8	0.12
	2 – 4 hours	49	24.3	153	75.7	
	5 – 6 hours	32	34.0	62	66.0	
	> 6 hours	18	39.1	28	60.9	
Keeping in touch with friends outside medical school	Never	15	37.5	25	62.5	0.003*
	Rarely	66	26.0	188	74.0	
	Often	51	26.7	140	73.3	
	Most of the time	13	25.0	39	75.0	
	All the time	12	66.7	6	33.3	
Smoking	Yes	24	35.5	44	64.7	0.35
	No	129	27.2	346	72.8	
	Ex-smoker	4	33.3	8	66.7	
Stimulant drugs	Yes	13	48.1	14	51.9	0.019*
	No	144	27.3	384	72.7	
Energy drinks	Never	85	25.3	251	74.4	0.028*
	Rarely	49	31.2	108	68.8	
	Often	16	32.7	33	67.3	
	Most of the time	4	40.0	6	60.0	
	All the time	3	100.0	0	00.0	

*Significant

Table 2 displayed the comparison between depressed and no depressed students according to their lifestyle factors. There were no statistically significant differences between depressed and non-depressed students in matters of how many fast food and soft drinks do they eat and drink per week as well as the time of spending in watching T.V. per day and smoking status of students. On the other hand, however, there were statistically significant differences regarding the number of meals per day where the higher proportion of the depressed students (51.7%) was among those reported to have had one meal per day ($p= 0.003$). Keeping in touch with friends outside medical school all the times showed a significant high prevalence of depression among the studied students (66.7%). Students reported uses of stimulating drugs have had a significant high prevalence of depression (48.1%). The prevalence of depression of depression was also significantly high among students using energy drinks, where the prevalence was 32.7%, 40% and 100%, respectively, among students reported often, most of the time and all of the time use of energy drinks.

Table 3. Distribution of depression among the studied students according to their associated chronic medical problems.

Medical problems associated factors		Depression				P value
		Yes		No		
		No.	%	No.	%	
Diabetes Mellitus	Yes	5	38.5	8	61.5	0.41
	No	152	28.0	390	72.0	
HTN	Yes	11	55.0	9	45.0	0.007*
	No	146	27.3	389	72.7	
IBS	Yes	21	36.2	37	63.8	0.16
	No	136	27.4	361	72.6	
Bronchial asthma	Yes	19	47.5	21	52.5	0.005*
	No	138	26.8	377	73.2	
Anemia	Yes	41	42.7	55	57.3	0.001*
	No	116	25.3	343	74.7	
Neck or back pain	Never	20	19.2	84	80.8	0.011*
	Rarely	58	25.3	171	74.7	
	Often	57	33.7	112	66.3	
	Most of the time	19	39.6	29	60.4	
	All of the time	3	60.0	2	40.0	
Neck or back pain effect on daily life	No	98	25.9	281	74.1	0.055
	Slightly	45	30.6	102	69.4	
	Moderately	11	45.8	13	54.2	
	Very much	3	60.0	2	40.0	
Neck or back injury	Yes	25	35.2	46	64.8	0.17
	No	132	27.3	352	72.7	
Visual problems	Yes	91	31.2	201	68.8	0.11
	No	66	25.1	197	74.9	

*Significant

Table 3 presented the distribution of depression among the studied students by their associated medical problems. The prevalence of depression was significantly high among students with hypertension (55%), bronchial asthma (47%), frequent back and neck pain (60%) and anemia (42.7%). Although not statistically significant differences, the prevalence of depression was high among students with DM (38.5%0, IBS (3.2%) and visual problems (31.2%).

Table 4. Comparison between depressed and non-depressed students according to study-related factors.

Study related factors		Depression				P value
		Yes		No		
		No.	%	No.	%	
GPA	> 4.5	52	27.8	135	72.2	0.94
	3.75 – 4.5	66	29.1	161	70.9	
	2.75 – 3.74	36	28.3	91	71.7	
	< 2.75	3	21.4	11	78.6	
Study hours per day	< 2 hours	84	32.6	174	67.4	0.2

	2 – 4 hours	47	25.5	137	74.5	
	5 – 6 hours	20	22.5	69	77.5	
	> 6 hours	6	25.0	18	75.0	
Study state	Self study all the time	78	28.3	198	71.7	0.73
	In a group study all the time	8	36.4	14	63.6	
	Mostly self study	58	26.7	159	73.3	
	Mostly in a group study	13	32.5	27	67.5	
Studying limits social life	Yes	117	29.0	287	71.0	0.57
	No	40	26.5	111	73.5	

*Significant

Table 4 showed the comparison between depressed and non depressed students according to their study related factors. The prevalence of depression showed no statistically significant difference by all study related factors. However, the prevalence was relatively low among those students with low GPA (21.4%), studying hours between 5 and 6 hours (22.5%), self study behavior (26.7%) and among those reported that studying does not limit their social activity (26.5%).

Table 5. Comparison between depressed and non-depressed students according to sleep habits.

Sleeping related factors		**Depression**				**P value**
		Yes		**No**		
		No.	%	No.	%	
Sleep duration	< 5 hours	33	31.4	72	68.6	0.72
	5 – 7 hours	88	27.8	229	72.2	
	> 7 hours	36	27.1	97	72.9	
Time spent in bed before sleeping	< 30 minutes	66	25.9	189	74.1	0.000*
	30 – 60 minutes	55	25.3	162	74.7	
	> 1 – 2 hours	27	38.0	44	62.0	
	> 2 hours	9	75.0	3	25.0	
Sleep medications	Never	128	26.5	355	73.5	0.004*
	Rarely	19	33.3	38	66.7	
	Often	8	66.7	4	33.3	
	Most of the time	2	66.7.0	1	33.3	
Exam night sleep						0.37
	< 3 hours	107	43.7	245	56.3	
	3 – 6 hours	45	23.9	143	76.1	
	> 6 hours	5	33.3	10	66.7	
Exam night sleep effect on performance	Good	48	28.9	118	71.1	0.8
	Bad	47	29.7	111	70.3	
	No effect	62	26.8	169	73.2	

*Significant

Table 5 presented the distribution of prevalence among the studied students according to their sleeping habit. Time spent in bed before sleeping, and use of sleep medications showed significant high prevalence of depression. The students spent > 2 hours in bed before sleep showed a prevalence of 75%. The students reported use of sleep medication was also showed high prevalence of depression (66.7%). Other sleeping related factors revealed no statistically significant differences regarding the prevalence of depression among the studied students, although the prevalence was high among students reported < 5 hours of sleeping (31.4%), and those reported sleeping less than 3 hours at examination night (43.7%).

DISCUSSION

The present study revealed a relatively high prevalence of depression among medical students at Taibah College of medicine. The estimated prevalence was 28.3% (95% CI= 24.5%-32.1%). A similar prevalence was reported in a recent Saudi study conducted on 136 medical students of Umm Al-Qura University in Makkah, Saudi Arabia, where the overall prevalence of depression among the studied students was 30.9% (11). A much higher prevalence, however, was reported in previous Saudi studies. The prevalence of depression among medical students was 53% in one study conducted in College of Medicine, King Faisal University in Al Ahsaa region (10), and it was 63% in another study conducted on 775 medical students of College of Medicine, King Saud University in Riyadh city (11). The higher prevalence of depression among medical students has been explained by several theories in many researches. Some have contributed these findings to that medical students pass through continuous examinations throughout their academic years. Studying medicine is competitive. Several academic stressors were reported in many previous researches (16).

The prevalence of depression among medical students in this study showed significant variations by some socio-demographic characteristics of students. The prevalence was significantly high among female students (31.6%), single students (29.6%), and among students who reported living alone (33.3%). In all previously mentioned Saudi studies, the prevalence of depression and stress was higher among the female students. Also, in a recent cross-sectional conducted on 450 female medical students in King Abdulaziz University, Jeddah, Saudi Arabia, the prevalence of depression was 36.5%; while 21.8% and 14.7% had a border-line and morbid depression, respectively (17).

Other studies conducted Australia (18), and Finland (19), however, have shown that the gender differences in specific stress symptoms and overall prevalence or mean scores of stress were scarce and did not turn out to be a significant factor in reporting of stress. According to Saudi higher educational policy, however, there are separate campuses for male and female students in their studies, and it could be speculated that relatively a poor learning environment exists in the female campus with lesser educational facilities and recreation opportunities would increase the level of stress and depression among them. However, this issue is just speculation and requires further investigation. Single students and those living lonely, away from their family, showed significant high prevalence of depression. This finding appeared consistent with the results of South Korean study reported high depression prevalence among students living alone at a lodging house or a rented room , unmarried students, and among students with financial difficulty (20).

Although not significant, the level of depression in this study was found to decrease as the students progressing in their study years. It was 33.6% and 31.4% in the 2nd and 3rd academic years, respectively, and it was reduced to reach 22.1% among students in the 5th year. This finding has been documented in other studies (12, 19). These findings, however, were contradictory to the finding of another study where the level of stress increased progressively during the course, to reach as high as 40% by the end of the clinical training period (21). Results of other studies in North America, however, suggest that mental health worsens after students join a medical school and remains poor throughout the course (22), especially in the transition from basic science teaching to clinical training (23). These contradictions could be attributed to the nature of the present and other similar studies as they were cross-sectional and not cohort studies to be sure that the stress is really decreasing in the study subjects.

The comparison of depression prevalence among medical students in this study by their lifestyle characteristics showed significant variations. The prevalence was significantly high among students reported eating only one meal per day where the (51.7%), and among those kept in touch with friends outside medical school all the times (66.7%). Also, students reported uses of stimulating drugs and energy drinks were found to have a significant high prevalence of depression. Consistent with these findings, bad dietary habit, stimulating medications and energy drinks were found in many studies to be associated with increased risk of mental and psychological disturbance, particularly among adolescents (24-26) Also, the prevalence of depression in this study was higher among smokers (35.5%), and this finding contribute to the evidence suggests that individuals with increased anxiety are more likely to smoke (27,28).

Estimating the prevalence of depression in the studied medical students by their associated medical problems revealed significant high prevalence among students with hypertension, anemia, bronchial asthma and backache. Anxiety symptoms and disorders are found to be associated with a range of general medical disorders (29). However, this association may be a physiologic consequence of the general medical disorder, a psychologic reaction to the experience of having a medical illness, or a chance occurrence of medical problems because of the psychologic disorders. To confirm, longitudinal study design has to be conducted to examine the sound the relationship between psychological disorder and medical problems. The same suggestion has to be applied for our study results regarding the significant high prevalence of depression among medical students reported sleeping disorders. Sleep disturbances commonly are associated with many psychologic disorders including anxiety disorders, and depression, and sleep loss may exacerbate and contribute to relapse of these conditions (30-32).

The study findings revealed varying level of depression among the studied students according to their study related factors. The prevalence was relatively low among students with low GPA (21.4%), self study behavior (26.7%), their studying hours was between 5 and 6 hours (22.5%), and among those reported that studying does not limit their social activity (26.5%). In a previous similar Saudi study, it has been found that students who had moderate and high performance in examination were less likely to develop depression compared to those who had low performance (11). Moreover, some studies have reported no meaningful anxiety-level differences between the SP and MCQ examinations (33).

The strengths of the present study include that the used study questionnaire was comprehensive and based on a simple and valid PQ-2 instrument for depression screening. To the best of the available knowledge, this study is the first to screen for depression among medical students at Taibah College of medicine. Compared to previous similar Saudi studies, the current study recruited all registered male and female students during the study year 2014. The recruitment of all registered students and the obtained high response rate (92.5%) consolidated the study findings. Moreover, this study has compared the prevalence of depression among the studied students by several groups of risk factors; including socio-demographic, lifestyle, associated medical problems, study and sleeping related factors. Some of these factors were not touched before in other similar studies.

This study has also number of limitations. Self-selection and information bias may have been a limitation factor in this study. However, because of the high response rate and the anonymous and electronic distributed questionnaire have greatly minimized the bias expected from the fear of stigma. The use of simple two questions (PQ-2) for depression screening in this study may the validity of this instrument. However, the use of cutoff of 3 (0-6 scores) is known to enhance sensitivity and improve specificity of this instrument. The reliability studies have documented the validity of PQ-2 and PQ-4 as ultra-brief measures of depression and anxiety not only among students but also in the general population (14,15). Furthermore, because of high prevalence of depression among medical students reported in previous Saudi and non Saudi studies would increase the positive predictive value of the instrument. Finally, being a cross-sectional design and including

students from only one medical college, that future research will need to include students from other health related colleges such as college of pharmacy, dentistry and nursing to assess the extent of the problem in medical students affiliated to different health related colleges.

In conclusion, the prevalence of depression was relatively high, particularly among female and single students. The study hypothesized several risk factors to influence the occurrence of this problem among the studied medical students. Among these factors, family structure, social status, dietary habits play great role. Also, the study and sleeping related factors were appeared to influence the prevalence in the studied students. Addressing these results at faculty level may help to increase awareness of students and faculty administrators about this health problem. Also, the findings of study may encourage more researchers to take this important topic into their consideration studying it on large scale in well designed longitudinal study with the aim to develop effective preventive and counseling services for the students.

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Conflict of interest

The authors declare that there have no competing interests and that they have not received any grants for this study.

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