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## Alexandria Journal of Medicine

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Original Article

# Screening for psychological distress among High School Graduates Accepted for Enrollment at Alexandria Faculty of Medicine: Academic year 2016/2017



الاكتشاف المبكر للاضطراب النفسي بين خريجي المدارس الثانوية المقبولين للالتحاق بكلية الطب جامعة الإسكندرية العام الجامعي 2017–2016

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## ABSTRACT

**Background:** Mental and psychological health of adolescents in general and prospective medical students in particular is a priority area to investigate as it affects wellbeing of the future doctors.

**Objectives:** The current research was conducted to screen first year medical students accepted for enrollment at Alexandria Faculty of Medicine to identify those with a high probability of having psychological distress before the start of academic courses as well as explore the sources of stress among them.

**Methods.**

A cross sectional survey of 779 high school graduates accepted for admission to Alexandria Faculty of medicine was conducted. Participants were approached on the days of obligatory pre-enrollment medical examination. The translated Arabic version of DASS 21 questionnaire was used to screen students for three negative emotional symptoms namely depression, anxiety and stress. Inquiry about age, sex, residency and type of high school was added.

**Results:** More than a tenth of studied medical students (12.6%) suffered from severe or profound stress and 29.1% of them had mild to moderate stress. Moreover, one fifth (20%) of studied students were severely anxious and less than one third (29.3%) had mild to moderate anxiety. Severe and profound depression was diagnosed among 14.3% of students whereas, 18.7% them were moderately depressed. No association was found between any of studied negative emotional symptoms and the students' educational background or their residency.

**Conclusion:** Nearly half of the prospective medical students might have some sort of psychological distress before starting their study in the Faculty of Medicine. They should be investigated to verify diagnosis and start intervention to minimize its adverse effects on academic performance and advancement at the faculty. Stress management courses should be considered for all medical students.

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## 1. Introduction

The World Health Organization defines mental health as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community”.<sup>1</sup> The Health people 2020 Leading Health

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Indicators (LHIs) is a subset of Healthy People objectives chosen to communicate high-priority health issues and actions that can be taken to address them. There are 26 LHIs organized into 12 topics. Mental health is one of these 12 topics and percent of adolescents with major depressive disorders one of LHIs.<sup>2</sup>

Adolescents experience many physical, emotional, hormonal, social and intellectual pressures. These pressures can easily lead to one or more of a variety of mental health disorders; all are matters of concern.<sup>3</sup> Half of all mental health disorders in adulthood start by age 14, but most cases are undetected and untreated.<sup>4</sup> In U.S, the lifetime prevalence of mental disorders severe enough to cause significant impairment in daily functioning among adolescents is approximately 20%.<sup>5,6</sup> Higher figures were reported in studies conducted among high school students in Arab and developing countries.<sup>7–9</sup>

Stress of studying and challenge of admission to the college among high school students add greatly to the usual stressors among adolescents and might lead to a higher probability of developing psychological distress.<sup>6</sup> In addition, Transition of teens graduating from high school to college is a time of excitement and adventure for many young people and filled with uncertainty. This particular situation might bring up things to think about regarding general well-being and many health concerns include negative mental and emotional symptoms.<sup>10</sup>

Studies conducted in many countries found that the prevalence of some emotional and mental health problems among medical students across different grades is substantially high.<sup>11–13</sup> This could be attributed to stressful and demanding work schedule at the faculty, frequent exams, excessive competition, being away from home, lack of leisure time and contact with death.

Joining medical school with pre-existing emotional or mental ill health will affect the ability of students to cope with these stresses and adjust to them and this might increase the probability of developing major health problems including mental ones. Early screening and diagnosis of medical students even before enrolment in their academic courses allow providing the required support and proper management of any pre-existing disorder that can affect their academic performance and advancement.<sup>14–16</sup>

The current research was conducted to screen first year medical students to identify those with a high probability of having psychological distress before the start of academic courses for further investigations as well as to explore the major sources of stress among them.

## 1.2. Subjects and methods

A comprehensive survey of all high school graduates accepted for enrollment at Alexandria Faculty of Medicine for the academic year 2016/2017 was adopted. Students were approached on the days of obligatory pre-enrollment medical examination (3 consecutive days). Students less than 18 years old were excluded as a written consent should be obtained from their parents (n = 41) rendering the number of eligible students equal 876. Participation of students was voluntary. The response rate was 93.5%.

Data were collected using a self-administered questionnaire include baseline data about students' age, residency, place of living in Alexandria and type of high school as well as tools for assessment of their level of psychological distress and an inquiry about the main sources of this psychological distress in their life if any. Assessment of psychological distress was done using the validated Arabic version of Depression, Anxiety, Stress scale (DASS 21) questionnaire.<sup>17</sup> It can be used to identify adolescents and adults with suspected disorders for further investigations. Psychometric properties of the both English and Arabic versions were assessed with proved reliability and validity.<sup>17–19</sup>

The validated Arabic version of DASS 21 questionnaire is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. Each of the three DASS-21 scales contains 7 items. Each of the 21 items is to be answered on a 4 points rating scale ranging from 0 = "Never" to 3 = "Almost always".

The score of each of the student's responses was multiplied by 2 for each subscale, and then classified according to DASS 21 scoring manual into five categories, namely normal, mild, moderate, severe and extremely severe disorder.<sup>17</sup> Stress level is categorized as normal (0–14), mild (15–18), moderate (19–25), severe (26–33), and extremely severe (34 and above). Regarding anxiety the score is categorized as normal (0–7), mild (8–9), moderate (10–14), severe (15–19) and extremely severe (20 and above). Depression level is measured by the depression subscale and categorized as normal (0–9), mild (10–13), moderate (14–20), severe (21–27) and extremely severe (28 and above).

IBM Statistics SPSS program version 20 was used in analyzing the data. Data was presented using number and percentage. As the data was not normally distributed, Chi-square test, Mann Whitney test and Kruskal-wallis test at 5% level of significance were used to verify significant association between demographic and educational characteristics of students and presence of psychological distress. Simple correlation between the three scores for stress, anxiety and depression was tested at 5% level of significance.

## 2. Results

### 2.1. Baseline characteristics of studied students. (n = 779)

Table 1 describes baseline characteristics of studied students. More than a half of screened students (57.8%) are girls. The majority of them (92.3%) aged 18 years old with only 7.7% of them were 19 years.

Nearly two thirds of students (63%) were from outside Alexandria and only 37% of students were from Alexandria. Regarding the place of living in Alexandria, 55.1% of them live with their family, nearly two fifths (42.5%) were residing the student university hostel and a minority live alone or with his/her relatives.

The vast majority of studied students (93.5%) were graduated from governmental secondary schools. only 6.6% of medical students were enrolled in private schools.

No statistically significant difference was found between male and female students regarding any of the previous characteristics. (P > 0.05)

### 2.2. Psychological distress among high school graduates accepted for enrollment at Alexandria Faculty of Medicine: Academic year 2016/2017

Table 2 demonstrates the results of screening of studied high school graduates for level of psychological distress. One eighth (12.6%) of enrolled students suffered from severe or profound stress and 29.1% of them had mild to moderate stress. No statistically significant difference was found between male and female students regarding the levels of stress however the mean stress score was significantly higher among female students as compared to males (P = 0.002).

Nearly 20% of studied students were suffering from severe to profound anxiety and 29.3% had mild to moderate anxiety. Female students were significantly more anxious than males as P < 0.001. Moreover the mean anxiety scale score was significantly higher among females.

**Table 1**

Baseline characteristics of studied high school graduates Accepted for Enrollment at Alexandria Faculty of Medicine: Academic Year 2016/2017.

Baseline characteristics	Males (n = 329)		Females (n = 450)		Total (n = 779)	
	No.	(%)	No.	(%)	No.	(%)
Residence						
Alexandria	113	34.3	175	38.9	288	37
Outside Alexandria	216	65.7	275	61.1	491	63
Place of living in Alexandria						
With family	177	53.8	252	56.0	429	55.1
Student hostel	139	42.2	192	42.7	331	42.5
With relatives	2	3.3	1	0.2	3	0.4
Alone	11	0.6	5	1.1	16	2.1
Type of school						
Governmental	307	93.3	421	93.6	728	93.5
Private Arabic	9	2.7	15	3.3	24	3.1
Private language	13	0.4	14	3.1	27	3.5

**Table 2**

Results of screening of studied students using DASS 21.

	Males (n = 329)	Females (n = 450)	Total (n = 779)	P Value
	No (%)	No (%)	No (%)	
Stress	204(62)	250(55.6)	454(58.3)	0.476
No stress				
Mild	45(13.7)	68(15.1)	113(14.5)	
Moderate	42(12.8)	72(16.0)	114(14.6)	
Severe	31(9.4)	50(11.1)	81(10.4)	
Profound	7(2.1)	10(2.2)	17(2.2)	
Total stress score	0–21	0–21	0–21	(0.002)*
Min.–Max				
Mean ± SD	6.37 ± 4.58	7.36 ± 4.33	6.94 ± 4.46	
Anxiety				(0.006)*
No anxiety	189 (57.4)	206 (45.8)	395 (50.7)	
Mild	63 (19.1)	85 (18.9)	148 (19.0)	
Moderate	27 (8.2)	53 (11.8)	80 (10.3)	
Severe	24 (7.3)	45 (10.0)	69 (8.9)	
Profound	26 (7.9)	61(13.6)	87 (11.2)	
Min.–Max.	0–21	0–21	0–21	(< 0.001)*
Mean ± SD.	3.75 ± 3.54	4.85 ± 3.95	4.38 ± 3.82	
Depression				(0.187)
No depression	170 (51.7)	226 (50.2)	396(50.8)	
Mild	55(16.7)	71(15.8)	126 (16.2)	
Moderate	57(17.3)	89(19.8)	146(18.7)	
Severe	16(4.9)	36(8.0)	52(6.7)	
Profound	31(9.4)	28(6.2)	59(7.6)	
Min.–Max.	0–21	0–21	0–21	(0.509)
Mean ± SD.	5.42 ± 4.53	5.55 ± 4.43	5.49 ± 4.47	

\* Significant at p value less than 5%.

According to DASS 21, nearly half of enrolled students had a certain level of depression ranged from mild to profound. Severe and profound depression was diagnosed among 14.3% of students and 34.9% had either mild or moderate depression. No statistically significant difference was found between male and female students regarding their state of depression.

No association was found between any of studied conditions of mental ill health and the type of high school or their residency ( $P < 0.05$ ).

Significant strong positive correlation was found between the scores of three DASS 21 subscales namely stress, anxiety and depression. ( $p < 0.001$  and  $r > 0.58$ ).

### 2.3. Sources of stress among students with symptoms suggestive of mental ill health. (n = 558)

Table 3 shows that the majority of students reported that studying and educational system are the main source of stress to them (88.4% and 99.3% respectively). On the other hand, less than two

thirds of them (62.2%) were under stress due to fears concerning the future. Family and social stresses were reported by 45.2% as one of their stressors. Relations with others were one of stressors reported by one quarter of students (25.4%). No statistically significant difference was found between male and female students regarding sources of stress in their lives.

#### 2.3.1. Discussion

The top three sources of stress perceived as highly stressful by medical students were examinations, large amount of content to be learnt, and lack of time to review what have been learnt.<sup>20</sup>

Mental health of medical students has been widely discussed over the past few years. The findings of several studies have raised concerns about the prevalence of some mental health conditions in medical students. [21–23] In a meta-analysis done by Puthran et al.<sup>24</sup> a total of 62 728 medical students were pooled across 77 studies. Their analyses demonstrated a global prevalence of depression amongst medical students of 28% (95% CI 24.2–32.1%).

**Table 3**  
Sources of stress among students with symptoms suggestive of psychological distress.

Sources of stress#	Males (n = 218) No. (%)	Females (n = 340) No. (%)	Total (n = 558) No. (%)	P value
Educational system stresses	217(99.5)	337(99.1)	554(99.3)	0.563
Stresses due to students' duties	189(86.7)	304(89.4)	493(88.4)	0.329
Fears concerning the future	133(61.0)	214(62.9)	347(62.2)	0.646
Family and social stresses	98(45.0)	154(61.1)	252(45.2)	0.458
Relations with others	50(22.9)	92(27.1)	142(25.4)	0.275

#Categories are not mutually exclusive.

Investigating Egyptian students showed higher levels of negative emotional states as compared to the figures worldwide which could be attributed to the educational system in the Egyptian Faculties.

DASS 21<sup>17</sup> questionnaire was used in two previous studies to estimate the prevalence of psychological distress among medical students at Alexandria faculty of medicine. The overall estimated prevalence of stress/emotional disturbance among students from all grades in the Faculty was 82.5% in the first research. However the more recent one reported a prevalence of 43.9% and 57.9% for anxiety and depression respectively among first year students after finalizing their first trimester in the faculty.<sup>25,26</sup> Abdel wahed and Hassan<sup>27</sup> who conducted their study at El Fayoum University, reported the prevalence of stress, anxiety and depression among medical students in different grades as 62.4%, 64.3%, and 60.8% respectively.

Existence of negative symptoms include depression, anxiety and stress at unfavorable levels among prospective medical students if not properly investigated and managed might adversely affect their health as well as their academic performance and advancement at the Faculty.

In the current study, screening of the majority of prospective medical students using DASS 21 for three negative emotional symptoms showed that nearly half of the students had some sort of distress. Moreover, Severe and profound depression were diagnosed among 14.3% of students and 12.6% of them were having severe or profound stress. Such figures are lower than those reported in the previous studies targeted medical students across various grades at the faculty and this might be attributed to the added academic stress during the years of education at the faculty. Unexpectedly, figures in the current study were much higher than those reported in a similar study conducted among prospective medical students in Malaysia in which DASS 21 was used. It was reported that no one of the students suffered neither severe nor profound depression and only 6% had mild to moderate depression. Moreover, 3.6% of them had unfavorable level of stress.<sup>20</sup>

There is much evidence that females report more depressive symptoms than males.<sup>28</sup> In the current study both stress and anxiety scores were significantly higher among female students as compared to males. Similarly, Calvarese M in his exploratory study to the effect of gender on the way of reacting to stress among university students reported that females experienced higher levels of depression, frustration, and anxiety than their male counterparts when reacting to stress.<sup>29</sup> In contrary, a previous study conducted by Saxena et al.<sup>30</sup>, one hundred first year Indian medical students were screened for stress using data from investigator tailored Medical Student Stress Questionnaire (MSSQ), Stress perceived was more in males students (82.2%) as compared to females (61.8%). This difference might be due to cultural differences between Malaysian students and other nationalities.

Hussain et al.<sup>31</sup> found that magnitude of academic stress was significantly higher among the private school students whereas Government school students were significantly better in terms of their level of adjustment. On the other hand, results from a

comparative study on Self Esteem and Stress among Private and Government High School Students in Taiwan revealed that students from government and private schools don't have any difference on self-esteem and stress.<sup>32</sup> In accordance, the current work showed no difference between graduates of different schools regarding their scores on DASS 21 scales.

Regarding sources of stress among enrolled students; studying and educational system were the main cited sources followed by fears concerning the future. Family and social stresses were reported by 45.2% of students with unfavorable emotional symptoms as one of their stressors. Similarly, Mostafa et al.<sup>26</sup> in a study of 379 medical students at Alexandria Faculty of Medicine including a sample from all grades of students reported that, curriculum overload as one source of academic stresses was the highest source of stress reported by 88.4% of students followed by fears about the future career (82.2%).

This study gives a baseline data for follow up of medical students to demonstrate the effect of academic stress and the educational system at the faculty on the students prospectively. Also, it is considered the first phase in an intervention program aiming at tackling the problem of mental illness among medical students at Alexandria University, Egypt.

### 3. Conclusion and recommendations

The next generation of doctors should have good mental health and that facilities must be in place to prevent mental ill-health wherever possible to provide timely and appropriate support for medical students who do experience problems. Mental health screening at medical schools allows staff to identify mental health conditions early and connect students with help.

A large percentage of psychological and emotional distress among medical students that was reported in many studies started before enrollment at the faculty and it is mostly attributed to academic stress in the high schools and challenge of joining the faculty. About 50% of first year medical students suffer from different degrees of distress before starting their academic work at the faculty. Such psychological distress and its effect on their academic achievement need to be followed up. Also, planning and implementation of an intervention preventive program against mental and psychological disorders among such high risk group is highly recommended.

### References

- World Health Organization. Mental health: a state of well-being. Updated August 2014 online at [http://www.who.int/features/factfiles/mental\\_health/en/](http://www.who.int/features/factfiles/mental_health/en/).
- Office of Disease Prevention and Health Promotion. Healthy People 2020. Leading Health Indicators. Available online at <<https://www.healthypeople.gov/2020/Leading-Health-Indicators>> (last updated 14/3/2017).
- American Academy of Pediatrics. Mental Health and Teens: Watch for Danger Signs. <<https://www.healthychildren.org/English/ages-tages/teen/Pages/Mental-Health-and-Teens-Watch-for-Danger-Signs.asp> updated 1/10/2015> (Last accessed February 2017).
- World Health Organization. Adolescents: health risks and solutions. Fact sheet, <<http://www.who.int/mediacentre/factsheets/fs345/en/>>. (Updated May 2016).

5. Merikangas KR. Lifetime prevalence of mental disorders in U.S. adolescents: results from the National Comorbidity Study-Adolescent Supplement (NCS-A). *J Am Acad Child and Adolesc Psychiatry*. 2010;49(10):980–989.
6. Leonard NR, Gwadz MV, Ritchie A, et al. A multi-method exploratory study of stress, coping, and substance use among high school youth in private schools. *Front Psychol*. 2015;6.
7. Abdulrhman M, Al-Sughayr, Mazen Ferwana S. Prevalence of mental disorders among high school students in National Guard Housing, Riyadh Saudi Arabia. *J Fam Comm Med*. 2012;19(1).
8. Xianchen L. Behavioral and emotional problems in Chinese Adolescent. *J Am Acad Child Adolesc Psychiatry*. 2001;40:64–78.
9. Fichter MM, Elton M, Diallyna M, Koptagel-Ilal G, Fthenakis WE, Weyerer S. Mental illness in Greek and Turkish adolescent's. *Eur Arch Psychiatry Neurol Sci*. 1988;237:125–134.
10. Mental Health Tips for Teens Graduating from High School. American Academy of Pediatrics 2013. (<<http://www.aap.org>>).
11. Silva AG, Cerqueira AT, Lima MC. Social support and common mental disorders among medical students. *Rev Bras Epidemiol*. 2014;17(1):229–242.
12. Sidik SH, Rampal L, Kaneson N. Prevalence of emotional disorders among medical students in a Malaysian university. *Asia Pacific Family Medicine*. 2003;2:213–217.
13. Yuvaraj BY, Poornima S, Rashmi S. Screening for overall mental health status using mental health inventory amongst medical students of a government medical college in North Karnataka, India. *Int J Commun Med Public Health*. 2016;3(12):3308–3312.
14. Breslau J. The impact of early behaviour disturbances on academic achievement in high school. *Paediatrics*. 2009;123:1472–1476.
15. Baskin TW. Does youth psychotherapy improve academically related outcomes? A meta-analysis. *J Couns Psychol*. 2010;57(3):290–296.
16. Puskar KR, Bernardo LM. Mental health and academic achievement: Role of school nurses. *J Specialists in Paediatric Nursing* 207; 12:215–23.
17. Moussa MT, Lovibond PF, Laube R. *Psychometric properties of an Arabic version of the Depression Anxiety Stress Scales (DASS21)*. Cumberland Hospital, Sydney: Report for New South Wales Transcultural Mental Health Centre; 2001.
18. Gomez, F. A guide to the depression, anxiety, and stress scale (DASS 21). Black Dog Institute ([http://www.iwsm.org.au/images/mental\\_health/Frequently\\_Used/Outcome\\_Tools/Dass21.pdf](http://www.iwsm.org.au/images/mental_health/Frequently_Used/Outcome_Tools/Dass21.pdf)).
19. Ng F, Trauer T, Dodd S, Callaly T, Campbell S, Berk M. The validity of the 21-item version of the Depression Anxiety Stress Scales as a routine clinical outcome measure. *Acta Neuropsychiatrica*. 2007;19(5):304–310.
20. Yusoff MSB, Rahim AFA, Baba AA, et al. Prevalence and associated factors of stress, anxiety and depression among prospective medical students. *Asian J Psychiatry*. 2013;6:128–133.
21. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med*. 2006;81:354–373.
22. Shaheena P, Shafiq M. Mental Health and coping among youth in Kashmir: Implication of psychological implications. *Delhi Psychiatry J*. 2014;17(2):295–302.
23. Ganesh K, Jain A, Supriya H. Prevalence of depression and its associated factors using Beck's Depression Inventory among students of a medical college in Karnataka. *Ind J Psychiatry*. 2012;54(3):223–227.
24. Puthran R, Zhang MWB, Tam W, Roger C. Prevalence of depression amongst medical students: a meta-analysis. *Medical Education April*. 2016;50(4):456–468.
25. Ibrahim MB, Abdelreheem MH. Alexandria University Faculty of Medicine Prevalence of anxiety and depression among medical and pharmaceutical students in Alexandria. *Alexandria J Med*. 2015;51(2):167–173.
26. Mostafa SR, Bassiouny A, El Shafie M, El Tarhony AH. Levels and predictors of stress among medical students in Alexandria. *Alexandria J Med*. 2006;42(4):9–11.
27. Abdel Wahed YW, Hassan SK. Prevalence and associated factors of stress, anxiety and depression among medical Fayoum University students. *Alexandria Journal of Medicine*. Available online 20 February 2016.
28. Boggiano AK, Baret M. Gender differences in depression in college students. *Sex Roles*. 1991;25(11):595–605.
29. Calvarese M. The effect of gender on stress factors: an exploratory study among university students. *Soc Sci*. 2015;4:1177–1184.
30. Saxena Y, Shrivastava A, Singhi P. Gender correlation of stress levels and sources of stress among first year students in a medical college. *Indian J Physiol Pharmacol*. 2014;58(2):147–151.
31. Hussain A, Kumar A, Husain A. Academic stress and adjustment among high school students. *J Indian Acad Appl Psychol*. 2008;34:70–73.
32. Reddy S, Kannekanti P, Hamza A. A Comparative study on self esteem and stress among private and government high school students. *IJRSL*. 2015;2(3):18–22.