Assessment of Mental Health among Iranian Medical Students: A Cross-Sectional Study

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Abstract:

Objectives: More mental morbidities were reported in medical students than their nonmedical peers, which may negatively influence their lives and future career. The aim of this study was to assess the mental health status among medical students of Shiraz University of Medical Sciences.

Method: Two hundred and eight 1st to 4th year Medical students took part in this cross-sectional study. General Health Questionnaire with 28 items (GHQ-28) was used for data collection. We performed descriptive statistics, Mann Whitney U test, one way ANOVA and Tukey's post hoc and Kruskal Wallis H and Chi square test for statistical analysis.

Results: The mean age of participants was 20.70 ± 1.14 (mean $\pm$ SD) years. More than half of them (54.4%) had total GHQ score above the cut-off point considered as probably abnormal mental health status. Years of education, positive family history and low satisfaction of the medicine discipline affected their mental health. Third and fourth year students had significantly higher mean scores of total GHQ (p-value = 0.009) and anxiety, somatic and social subscales (p-value = 0.001, 0.004 and 0.026). Students with positive family history of mental illness and low satisfaction of field of the study significantly had higher GHQ scores (p-value = 0.012 and < 0.001 respectively).

Conclusion: Poor mental health prevalence is high among medical students in Shiraz. Proper changes in educational programs and other effective interventions to raise the students' satisfaction may reduce the effect of other stress reasons and improve their mental health status.

Keywords: Medical students, Mental health, Depression, Iran

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Introduction

Mental health in medical students is a noteworthy issue due to their exposure to several stress factors during the medicine education years. Higher frequency of mental morbidity such as depression and anxiety and also higher levels of psychological distress were seen in medical students in comparison to general population, increasing with the years of training. [1]

Factors contributed to distress and the following impairments of mental health in medical students include examinations especially in first year students, [2] academic performance before and after medical school, [3] heavy work load, [4, 5] concerns for financial matters and lack of adequate sleep. [6, 7] This can result in adverse effects on academic performance, career, [3, 7] and contact with patients. [8] Other consequences may include cynicism, [5] burnout, [11] anxiety, depression and higher occurrence of alcohol and substance abuse among medical students. [1, 9, 10]

Mental problems in medical students are usually under diagnosed because of their concern for stigma and its unintended influence on their academic and career evaluation and reduction in hospital benefits. [11, 12]) So, medical student as future health care providers need special supports for improvement and protection of their mental health status.

Studies have been performed on this issue in different setting. A systematic review on the prevalence of depression, anxiety and distress among medical students outside North America suggested that the rates of theses mental morbidities are remarkable. [13]

A study in Vanderbilt University showed that anxiety and depression were more prevalent among medical students in comparison to other students of nonmedical disciplines and there were significantly higher rates of possibility of alcohol abuse and eating disorders. [14]

Similar study in Iran reported that close to 50 percent of the medical students had ill mental health based on General Health Questionnaire (GHQ) score and there were significantly different scores due to age, gender and level of education. [15]

However, according to our best knowledge there is not any published study assessing mental health in medical students of Shiraz, so we aimed to measure the prevalence of mental health disorders and some of its associations among this population.

Methods

We conducted this cross-sectional study to assess mental health among medical students of Shiraz University of Medical Sciences from February to April 2014.

The following formula was used to calculate the sample size, with p = 0.45 and using figures from previous similar study (16):

$$N = \frac{Z_{1-\alpha/2}\,(P)\,(1-P)}{E^2}$$

The sample size was calculated to be 240 and the participants were medical students of preclinical training years selected by stratified random sampling, who were administered the Persian version of General Health Questionnaire (GHQ-28). The sampling population was stratified by the year of entrance to the medical school and the participants were selected by proportion to size method and randomly by using random number table and based on the students ID number, in each layer.

The inclusion of the participants was based on being a first to fourth year medical student and to have the consent to participate in the study. Those who were not willing to complete the questionnaire were excluded and substituted by the next student on the list.

Thirty-two of participants were excluded because either the questionnaires were incomplete or the all 28 items of GHQ- 28 were not completed or they did not have the consent to participate in the study. So, data from 208 students were obtained for final data analysis.

Purpose of the study and the confidentiality issues were explained to the participants and instructions about answering the questionnaire were clearly given to them. We provided the self-administered questionnaire to those who volunteered to take part. Verbal consent of the participants were obtained before providing them the questionnaire.

The questionnaire consists of 2 parts; the first part includes questions of the demographic information and the second part consisted of 28 questions of GHQ-28. GHQ-28

was translated into 38 different languages since its introduction. The Cronbach's alpha of the reliability was varied from 0.78 to 0.95 in different studies. [17]

Previous studies have assessed the reliability and validity of Persian form of the GHQ-28 and were of acceptable ranges from 0.73 to 0.89. [18-20]

Through factor analysis, the GHQ-28 has been divided into four subscales, which are somatic symptoms (items 1–7); anxiety/insomnia (items 8–14); social dysfunction (items 15–21), and depression (items 22–28).

The Likert method of scoring from 0 to 3 was used. The scores were summed up by adding all the items on the scale ranging from 0 to 84.

Based on the mean score from the study, we used the cut-off point 23 for total score of the questionnaire.

Statistical Analysis

SPSS version 18 was used for statistical analysis of data. Descriptive statistics for means and frequencies, Mann Whitney U test, one way ANOVA and Tukey's post hoc and Kruskal Wallis H and Tamhane's T2 post hoc test were conducted to compare the GHQ sub scales and total mean scores between different groups and Chi square test to compare the proportion of students with abnormal total GHQ score (above the cutoff point) in different demographic groups. The alpha significant level was considered 0.05.

This study was conducted according to the principles of the Declaration of Helsinki and it was confirmed by Shiraz University of Medical sciences ethics committee (code: IR.SUMS.REC.1394.45)

Results

A total number of 208 medical students from first year to fourth year of training in medicine school took part in the study. Of these, 82 (39.6%) were male and 125 (60.4%) female. Mean age of the participants was 20.70 ± 1.14 (mean ± SD) years. The majority of the participants, 190(93.1%) were never married and only 9 (4.4%) of them were married. Self-reported monthly income of the family was considered as the socioeconomic status of the participants. The monthly income under 9 million Islamic republic of Iran Rials

(IRR) was considered as low socioeconomic, between 9 million to 15 million IRR as moderate and above 15 million IRR of family monthly income was indicated as high socioeconomic status. The majority of the participants were from the high and moderate socioeconomic status, 59.1% and 35.3% respectively. Positive family history of mental illness was seen in 35 (17.4%) of the students. One hundred and eighty participants (88.4%) were highly satisfied with their field of study as they reported.

One hundred and five of the participants (54.4%) had the total score of GHQ above the cutoff point and categorized as abnormal. The mean scores of the four subscales of social, anxiety, depression and somatic were 7.03 ± 4.41, 7.17 ± 4.49, 8.50 ± 3.98 and 4.54 ± 5.08 respectively.

There were no significant difference in total GHQ categories (normal and abnormal based on the cutoff point) and also the 4 subscales between males and females, although a higher proportion of males compared to the females scored above the cutoff point and so categorized as abnormal mental health status.

Mean of total GHQ score was significantly different due to year of training in medical school (p-value =0.009), as third and fourth year students had a higher mean score compared to second year students; significantly for the former with p-values equal to 0.004 and non-significant for the latter with a p-value of 0.06. Also the mean score of anxiety was higher in 4th and 3rd year students compared to second year students with p-value of 0.045 and < 0.001 respectively tested by ANOVA and tukey's posthoc test. Furthermore, mean scores of social and somatic subscales were significantly higher in 3rd year students compared to second year with p-value 0.026 and 0.004 respectively tested by Kruskall Wallis test. (See table 1)

The mean scores of total GHQ, social and somatic subscales were significantly higher in the students with a positive family history of mental illness in comparison with the students with negative family history with p-value equal to 0.020, 0.023 and 0.015 respectively. Also tested with chi square a higher proportion of students with positive family history of mental illness had abnormal mental health status (p =0.012).

A higher proportion of students with low satisfaction from their field of study had abnormal total GHQ score compared with the ones with high satisfaction (p-value<0.001). The mean scores of anxiety and somatic subscales were significantly higher in the former group (p-value = 0.049 and 0.011). All details are shown in table 2.

The participants' total GHQ scores were not significantly different between native and nonnative students, and in various marital and socioeconomic status. However, the lowest socioeconomic group had higher mean scores of total GHQ compared to moderate and high socioeconomic status.

Table 1: Mean ± SD scores of total general health questionnaire and its subscales scores in first to fourth year students and their comparison.

Students Training Year / GHQ* subscales	Anxiety (Mean ± SD)	Depression (Mean ± SD)	Somatic (Mean ± SD)	Social (Mean ± SD)	Total (Mean ± SD)
1st year	6.40 ± 3.16	7.26 ± 2.86	3.88 ± 3.49	1.72 ± 0.45	24.75 ± 9.47
2nd year	5.44 ± 3.96	8.22 ± 3.95	2.48 ± 3.06	1.44 ± 0.56	21.46 ± 12.19
3rd year	8.58 ± 4.68	8.55 ± 4.27	5.92 ± 5.74	1.79 ± 0.71	30.98 ± 17.73
4th year	7.67 ± 4.69	9.18 ± 3.82	5.06 ± 5.86	1.71 ± 0.68	29.16 ± 16.11
Total p-value	0.001	0.253	0.004	0.026	0.009

*General health questionnaire

Table 2: The mean scores ± SD of General health questionnaire- 28 in Shiraz medicine students based on gender, family history of mental illness and satisfaction of their field.

GHQ* scales (Mean ± SD) / Parameter	Gender		p-value	Family history of mental illness		p-value	Satisfaction from the field of study		p-value
	Male	Female		yes	No		High	Low	
Social	6.87 ± 4.79	7.13 ± 4.17	0.524	8.85 ± 4.98	6.62 ± 4.18	0.023	6.88 ± 4.22	7.91 ± 5.64	0.444
Anxiety	7.08 ± 4.73	7.23 ± 4.35	0.744	8.34 ± 4.97	6.89 ± 4.34	0.145	6.91 ± 4.39	8.83 ± 4.88	0.049
Depression	8.69 ± 4.11	8.37 ± 3.91	0.352	10.14 ± 5.21	8.17 ± 3.64	0.085	8.33 ± 4.01	9.54 ± 3.79	0.079
Somatic	5.31 ± 5.52	4.06 ± 4.74	0.075	6.54 ± 6.27	4.01 ± 4.66	0.015	4.12 ± 4.83	7.29 ± 6.12	0.011
Total	28.08 ± 17.24	26.65 ± 14.43	0.690	34.37 ± 19.33	25.61 ± 14.14	0.020	26.18 ± 15.11	33.58 ± 16.95	0.033

* General health questionnaire

Discussion

Our study is the first of its kind assessing mental health status and its associations in medical students of Shiraz University of Medical Sciences. More than half the participants had the score above the cutoff point, though were recognized as abnormal in the total GHQ scale. This can be a signal of medical training related distress affecting medical students' mental health. This is somehow close to the findings of Jafari et al, who reported near half of their participants had scored above the normal point in GHQ-12. [15] But this finding of our study is much higher than the prevalence of mental health problems in Dubai medical students found by Ahmadi et al. [16] The prevalence of mental morbidity was also higher among our participants compared with Turkish and Nepalese medical students, which are 48% and 20.9% respectively. [21,22] We found higher percentage of abnormal mental health status among our participants in comparison to a study conducted in Tehran University of Medical Sciences, which was 43.9%. [18] However, this difference between Shiraz and Tehran medical students' mental health status cannot be due to the difference between universities' educational curriculums; as medical educational programs are quite consistent in all the universities of Iran. Living conditions of the students are private homes or university dormitories in both cities, which may be different individually. We think the main reason for this difference is entering graduated students and interns to the above study; but our participants were undergraduate students. [18]

The higher mean scores of anxiety and especially depression rather than somatic and social subscales found in our medical students agrees with high proportion of these morbidities measured by their specific tools in United States and Canadian medical students, reported in the systematic review by Dyrbye et al. [1]

Although, there were no significant differences between genders, the prevalence of mental morbidity was higher in males in our study; and this is not similar to other studies' findings, which reported higher mental problems among females. [1, 7, 15, 18]

Third and fourth year medical students had higher proportions of abnormal mental health status with higher mean scores of all subscales; compared with second and first year students. This shows that years of training may negatively influence mental health. Longer time exposure to stress during the years of education might have caused this issue. It may also have deeper impact on students' mental health, such as developing anxiety and social problems overtime. This is consistent with the findings of Jafari et al; [15] but Sherina et al found no association between the years of study in medical school and mental health [7] neither Assadi et al found any significant difference between undergraduate students, interns and postgraduates. [18]

Although mean GHQ scores were not significantly different in three groups of socioeconomic status, the participants with lowest economic position had higher scores. Assadi et al also reported this; [18] similarly, being from a non-poor family was considered as a factor helping better mental health status by Yang et al. [23] However, socioeconomic status in our study was self-reported and only measured by family monthly income, which might not present the exact socioeconomic position of the participants.

Positive family history of mental illness may have an influence on people's mental health; as we found significant higher proportion of morbidity in social mental health status in these participants but this relationship was not reported in any other similar studies.

We found that satisfaction with the field of study may be a factor that would have an impact on mental health; as the participants, who were highly satisfied with the medical field had significantly better mean scores than those with low satisfaction. A study on Malaysian medical students showed a positive relationship between life satisfaction and depression; but there were no reports on students' satisfaction with their field of study and their mental health status. [24] We highly suggest to measure the students' satisfaction by specific tools and evaluate its relationship with their mental health status in future studies.

Our study reported essential descriptive findings of Shiraz medical students' mental health status in preclinical medical school training and some of its associations, which was not available to this day. Besides, this is a very important and prioritized subject and there is a lack of studies in our region. This study provides fundamental information for future

researches, educational and health policy making and appropriate interventions in needed areas to help improve medical students' mental health, as it can have a great influence on their lives and career.

The limitations of this study were the lack of a comparison group of nonmedical students or medical students in clinical years of training and to suffice to self-reported variables of socioeconomic status and participants' satisfaction.

Conclusion

The prevalence of mental health morbidity is considerable among medical students in Shiraz. Proper changes in educational programs and other effective interventions to rise the students' satisfaction may reduce the effect of other stress factors and improve their mental health status.

Future researches may be conducted to compare medical students' mental health with non-medical students. Longitudinal studies may be carried out to assess medical students' mental status, later through their training years.

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Authors' Contributions

All authors report no conflicts of interest relevant to this article.

References:

1. 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; 81:354-73.
2. Pradhan G, Mendinca NL, Kar M. Evaluation of Examination Stress and Its Effect on Cognitive Function among First Year Medical Students. J Clin Diagn Res. 2014; 8:BC05-7.
3. Stewart SM, Lam TH, Betson CL, Wong CM, Wong AM. A prospective analysis of stress and academic performance in the first two years of medical school. Med Educ. 1999; 33:243-50.
4. Guthrie EA, Black D, Shaw CM, Hamilton J, Creed FH, Tomenson B . Embarking

upon a medical career: psychological morbidity in first year medical students. Med Educ. 1995; 29:337-41.
5. Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: causes, consequences, and proposed solutions. Mayo Clin Proc. 2005; 80:1613-22.
6. Wolf TM, Faucett JM, Randall HM, Balson PM. Graduating medical students' ratings of stresses, pleasures, and coping strategies. J Med Educ. 1988; 63:636-42.
7. Sherina MS, Rampal L, Kaneson N. Psychological stress among undergraduate medical students. Med J Malaysia. 2004; 59:207-11.
8. Backović DV, Zivojinović JI, Maksimović J, Maksimović M. Gender differences in academic stress and burnout among medical students in final years of education. Psychiatr Danub. 2012; 24:175-81.
9. Ball S, Bax A. Self-care in medical education: effectiveness of health-habits interventions for first-year medical students. Acad Med. 2002; 77:911-7.
10. Newbury-Birch D, Walshaw D, Kamali F. Drink and drugs: from medical students to doctors. Drug Alcohol Depend. 2001; 64:265-70.
11. Center C, Davis M, Detre T, Ford DE, Hansbrough W, Hendin H et al. Confronting depression and suicide in physicians: a consensus statement. JAMA. 2003; 289:3161-6.
12. Schwenk TL, Davis L, Wimsatt LA. Depression, stigma, and suicidal ideation in medical students. JAMA. 2010; 304:1181-90.
13. Hope V, Henderson M. Medical student depression, anxiety and distress outside North America: a systematic review. Med Educ. 2014; 48:963-79.
14. Ghodasara SL, Davidson MA, Reich MS, Savoie CV, Rodgers SM. Assessing student mental health at the Vanderbilt University School of Medicine. Acad Med. 2011; 86:116-21.
15. Jafari N, Loghmani A, Montazeri A. Mental health of Medical Students in Different Levels of Training. Int J Prev Med. 2012; 3(Suppl 1):S107-12.
16. Ahmadi J, Galal Ahmed M, Ali Bayoumi F, Abdul Moneenum A, Alshawa H. Mental health of dubai medical college students.

Iran J Psychiatry Behav Sci. 2012; 6:79-83.

17. Jackson C. The General Health Questionnaire. Occupational Medicine. 2007; 57: 59.

18. Assadi SM, Nakhaei MR, Najafi F, Fazel S. Mental health in three generations of Iranian medical students and doctors. A cross-sectional study. Soc Psychiatry Psychiatr Epidemiol. 2007; 42:57-60.

19. Noorbala AA, Bagheri Yazdi SA, Mohammad K. The Validation of General Health Questionnaire- 28 as a Psychiatric Screening Tool. Hakim Research Journal. 2009; 11:47- 53. [In Persian]

20. Taghavi M. Assessment of the Validity and Reliability of the General Health Questionnaire. J Psychology. 2001; 5: 381-98. [In Persian]

21. Aktekin M, Karaman T, Senol YY, Erdem S, Erengin H, Akaydin M. Anxiety, depression and stressful life events among medical students: a prospective study in Antalya, Turkey. Med Educ. 2001; 35:12-7.

22. Sreeramareddy CT, Shankar PR, Binu VS, Mukhopadhyay C, Ray B, Menezes RG. Psychological morbidity, sources of stress and coping strategies among undergraduate medical students of Nepal. BMC Med Educ. 2007; 7:26.

23. Yang F, Meng H, Chen H, Xu XH, Liu Z, Luo A et al. Influencing factors of mental health of medical students in China. J Huazhong Univ Sci Technolog Med Sci. 2014; 34:443-9.

24. Swami V, Chamorro-Premuzic T, Sinniah D, Maniam T, Kannan K, Stanistreet D, et al. General health mediates the relationship between loneliness, life satisfaction and depression. A study with Malaysian medical students. Soc Psychiatry Psychiatr Epidemiol. 2007; 42:161-6.