Original Article

Mental Health Status of Medical Students: A Cross Sectional Study

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Abstract

Background: Mental health of medical students who will be responsible for community health has great importance. This study was designed to determine the prevalence of probable mental disorders during the internship period of medical students.

Methods: This descriptive cross sectional study evaluated 404 medical students of Shahid Beheshti University of Medical Sciences, in Tehran, the capital of Iran. The data collecting instrument was a self-rated questionnaire including standard mental health questionnaire SCL-90-R, demographic and socio-economic data. The score 0.7 and above were designated as possible cases of mental disorders. Analysis performed by SPSS software, version 14 (SPSS Inc, Chicago, Il, USA). p-value<0.05 was considered significant.

Results: 53.8% of participants were female, and 79.4% were single. From all participants, 14.1% had Global Severity Index (GSI) score more than 0.7. Mean and standard deviation of GSI score was 0.32 (0.27). The frequency of probable mental disorder in medical students was 16.3% in somatization; 24.5% in obsessive-compulsive; 15.6% in interpersonal sensitivity; 16.8% in depression; 18.8% in anxiety; 14.6% in hostility; 11.4% in phobic anxiety; 16.8% in paranoid ideation and 13.9% in psychoticism. Students who had no children, lived in dormitory, had good economic status and were satisfied with their private life and studying course had significantly lower GSI scores.

Conclusion: Between 11 to 24% of the students had mental disorders in different dimensions and economic status, living place and number of children were related to the disorders.

Keywords: Education, Internship and residency, Medical, Mental health, Students

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Introduction

Basic medical certification may take from five to eight or even nine years, depending on the universities educational curriculums. The goal of medical education is training professionals to have the appropriate knowledge, skills and attitudes for meeting rapidly transforming health care needs (1-3). Medical curriculums almost always have had significant psychological distress for physicians-in-training and could negatively affect their mental health and therefore, their academic performance. Transition periods, especially between pre-clinical, clerkship and internship are particularly stressful and can damage the mental health of the students (4). In comparison with general population and age matched peers higher prevalence of depression and anxiety had been reported in

medical students and the studies showed higher psychological distress in female students (1).

Different levels of stress had been shown in studies on mental health of medical students worldwide. A review of studies on mental disorders of medical students in Western countries shows a frequency of 20% to 35% (5-8). In Iran conventional medical degree programs take 7 years, 5 semesters for basic sciences, 1 year for physio-pathology, 2 years for clerkship and 18 months for internship. Studies on Iranian medical students revealed a frequency of mental disorders between 31% and 51.8% (9,10). Although, there are a few studies on mental health situation of medical students in internship period, but there is not enough evidence to be generalizable to all medical students. We need more studies to make more valid and reliable evidence for policy makers.

This study was designed to determine the prevalence of probable mental disorder in internship period of Iranian medical students at Shahid Beheshti University of Medical Sciences using SCL-90-R standard questionnaire.

Methods

This descriptive cross sectional study evaluated 404 medical students in internship period at Shahid Beheshti University of Medical Sciences, in Tehran, the capital of Iran. Medical education in Iran lasts about seven years and consists of one and a half year internship period at the end. The method of sampling was census. The questionnaires were anonymous and participation in the study was voluntary.

The data collecting instrument was a self-rated questionnaire including standard mental health questionnaire SCL-90-R, demographic and socio-economic data (age, gender, marital status, number of children, partner's degree and occupation). We measured variables that may have an association with mental health of participants, as number of shifts and economic status (housing situation, having private car and cellphone). The SCL-90-R was first developed in 1973 by Derogatis et al., for assessment of psychological distress (11). The SCL-90-R was translated into Persian (the official language of Iran), and the validity and reliability has been assessed (10, 12, 13). Correlation coefficient of the questionnaire was 0.97. Internal consistency for all dimensions of the questionnaire was more than 0.70. The sensitivity and specificity was 0.94 and 0.98 respectively by comparing the questionnaire with DSM III-R psychiatric interview (12, 14). Five point Likert scale of distress from zero (none) to four (extreme) used for SCL-90-R items. This scale measured the experienced distress related to listed symptoms during the last 7 days in nine symptom dimensions. The score 0.7 and above were designated as possible cases of mental disorder, this cutoff point was chosen based on similar studies (10, 12, 15, 16).

Statistical analyses performed by SPSS software, version 14 (SPSS Inc, Chicago, Il, USA). We used chi-square and Fissure exact test for categorical variables, and t-statistics, and one-way ANOVA and Kruskal-Wallis test for continuous variables. $p\text{-value}<0.05$ was considered significant in analysis.

Results

404 medical interns participated in the study. 53.8% of participants were female, 79.4% were single and 79.5% of married students had no children. Literacy and job of spouse, satisfaction with studying discipline, age and minimum monthly shifts had significant differences between genders. Other socio demographic characteristics are illustrated in table 1.

The mean and standard deviation of total GSI score and nine subscale scores of SCL-90-R questionnaire in compare with cutoff point 0.7 are shown in table 2. Of all participants 14.1% had GSI score more than 0.7.

Table 1. Demographic and other characteristics of participants

Sex	**Female N (%)**	**Male N (%)**	**Total N (%)**	**P value**
	214 (53.8)	184 (46.2)		
Marital status				0.46
Married	43 (20.2)	35 (19.1)	78 (19.6)	
Single	170 (79.4)	146 (79.3)	316 (79.4)	
Divorced	1 (0.4)	3 (1.6)	4 (1.0)	
Number of children				0.11
Zero	33 (76.7)	29 (82.9)	62 (79.5)	
One	7 (16.3)	6 (17.1)	13 (16.6)	
Two and more	3 (7.0)	0	3 (3.9)	
Literacy of spouse				0.004
Diploma	4 (7.8)	9 (20.5)	13 (13.4)	
BS	9 (17.6)	18 (40.9)	28 (28.9)	
MS	14 (27.5)	4 (9.1)	19 (19.6)	
Doctorate	24 (47.1)	13 (29.5)	37 (38.1)	
Job of spouse				<0.001
Clerk	15 (30)	7 (16.3)	22 (23.4)	
Non-governmental	18 (36)	2 (4.7)	20 (21.3)	
University student	16 (32)	22 (51.2)	39 (41.5)	
Housekeeper	1 (2)	12 (27.9)	13 (13.8)	
Type of residence				0.77
Own personal	59 (29.2)	44 (26)	103 (27.5)	
Rented	18 (8.9)	20 (11.8)	38 (10.2)	
Dormitory	74 (36.6)	61 (36.1)	135 (36.1)	
With parents	51 (25.2)	44 (26)	98 (26.2)	
Private car				0.08
Yes	89 (42.6)	93 (51.4)	183 (46.3)	
No	120 (57.4)	88 (48.6)	212 (53.7)	
Mobile phone				0.55
Yes	202 (95.3)	170 (93.9)	376 (94.5)	
No	10 (4.7)	11 (6.1)	22 (5.5)	
Economic status				0.40
Weak	28 (13.3)	31 (17.1)	61 (15.4)	
Fair	128 (61)	99 (54.7)	229 (57.8)	
Good	54 (25.7)	51 (28.2)	106 (26.8)	
Satisfaction with private life				0.77
Weak	42 (20)	32 (17.5)	76 (19.1)	
Fair	97 (46.2)	90 (49.2)	188 (47.2)	
Good	71 (33.8)	61 (33.3)	134 (33.7)	
Satisfaction with studying discipline				0.01
Weak	13 (6.2)	26 (14.1)	39 (9.8)	
Fair	88 (41.7)	79 (42.9)	171 (42.8)	
Good	110 (52.1)	79 (42.9)	190 (47.5)	
	Mean (SD)	Mean (SD)	Mean (SD)	
Age	24.3 (1.85)	25.1 (2.06)	24.7 (2.01)	<0.001
Length of internship (months)	8.5 (5.13)	9.0 (5.45)	8.8 (5.29)	0.44
Minimum monthly shifts (days)	6.4 (1.98)	7.3 (1.87)	6.9 (1.9)	0.001

The frequency of probable mental disorder in medical students was 66 (16.3%) in somatization; 99 (24.5%) in obsessive-compulsive; 63 (15.6%) in interpersonal sensitivity; 68 (16.8%) in depression; 76 (18.8%) in anxiety; 59 (14.6%) in hostility; 46 (11.4%) in phobic anxiety; 68 (16.8%) in paranoid ideation; and 56 (13.9%) in psychoticism.

Table 2. Scores of total GSI and seven scopes of SCL-90-R questionnaire comparing with cutoff point 0.7

	Mean (SD)	P value	95% CI
Total GSI	0.32 (0.27)	<0.001	(-0.40) –(-0.34)
Somatization	0.34 (0.30)	<0.001	(-0.38)- (-0.32)
Obsessive-Compulsive	0.37 (0.32)	<0.001	(-0.35) –(0.28)
Interpersonal sensitivity	0.33 (0.32)	<0.001	(-0.39) - (0.33)
Depression	0.35 (0.31)	<0.001	(-0.37) - (-0.30)
Anxiety	0.32 (0.31)	<0.001	(-0.40) – (0.34)
Hostility	0.34 (0.31)	<0.001	(-0.39) - (0.32)
Phobic Anxiety	0.19 (0.29)	<0.001	(-0.53) – (0.47)
Paranoid ideation	0.36 (0.33)	<0.001	(-0.37) – (0.30)
Psychosis	0.26 (0.29)	<0.001	(-0.46) – (0.40)

Total GSI and nine sub scale scores did not have significant difference between genders. In compare with divorced medical students their married peers had lower scores in obsessive compulsive and inter personal scales. Students who did not have children had lower GSI and nine sub scale scores as compare with having both one and two or more children. Students living in dormitory had significantly lower scores in total GSI, somatization and paranoid ideation scales. Students who lived in rented houses had higher scores in interpersonal sensitivity, anxiety, depression and psychosis than students who lived in dormitory. Students who had car were less anxious. Students who owned cell phone had lower psychosis scores. Good economic status caused lower scores in interpersonal sensitivity. Students with good and fair economic status had significantly lower scores in phobic anxiety scale as compare with peers with weak economic status. Good satisfaction with private life caused lower scores in total GSI, depression and anxiety scales. Students with good and fair satisfaction with studying discipline had lower GSI and nine subscales scores of SCL-90-R questionnaire. The results of GSI and nine subscales comparison within different socio demographic variables are illustrated in table 3.

Discussion

The results of our study showed that the prevalence of probable mental disorder in the students of medicine in our study was lower than Iranian general population (17). A comparison between medical and non-medical student's mental distress using SCL-90-R questionnaire showed that Global Severity Index (GSI) in medical and non-medical students was 0.6 and 0.36 respectively (14).

Table 3. Comparing mean (SD) of total GSI and nine subscales scores of SCL-90-R questionnaire within different socio demographic variables

	GSI	Somatization	Obsessive-Compulsive	Interpersonal sensitivity	Depression	Anxiety	Hostility	Phobic Anxiety	Paranoid ideation	Psychosis
Gender	0.39*	0.73	0.72	0.14	0.15	0.24	0.66	0.15	0.50	0.69
Female[1]	0.33 (0.27)	0.34 (0.31)	0.38 (0.32)	0.35 (0.32)	0.37 (0.32)	0.33 (0.31)	0.33 (0.31)	0.20 (0.29)	0.36 (0.33)	0.26 (0.28)
Male[2]	0.31 (0.28)	0.33 (0.30)	0.37 (0.33)	0.30 (0.31)	0.33 (0.31)	0.30 (0.31)	0.35 (0.32)	0.17 (0.29)	0.34 (0.33)	0.25 (0.29)
Marital status	0.053	0.23	0.008	0.03	0.09	0.06	0.01	0.052	0.18	0.002
Married[1]	0.30 (0.29)	0.35 (0.33)	0.33 (0.33)[3]	0.30 (0.32)[3]	0.33 (0.33)	0.29 (0.32)	0.32 (0.34)[3]	0.20 (0.31)	0.34 (0.34)	0.22 (0.29)[3]
Single[2]	0.33 (0.26)	0.33 (0.28)	0.39 (0.31)	0.34 (0.31)	0.36 (0.30)	0.33 (0.30)	0.34 (0.29)	0.18 (0.27)	0.36 (0.32)	0.27 (0.28)
Divorced[3]	0.64 (0.32)	0.61 (0.38)	0.72 (0.30)[1]	0.64 (0.41)[1]	0.61 (0.32)	0.56 (0.32)	0.73 (0.34)[1]	0.57 (0.37)	0.63 (0.41)	0.70 (0.33)[1]
No. of children	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
none[1]	0.18 (0.24)[2, 3]	0.22 (0.31)[2, 3]	0.20 (0.30)[2, 3]	0.20 (0.32)[2, 3]	0.20 (0.30)[2, 3]	0.17 (0.28)[2, 3]	0.18 (0.29)[2, 3]	0.09 (0.23)[2, 3]	0.18 (0.28)[2, 3]	0.12 (0.24)[2, 3]
One[2]	0.43 (0.25)[1]	0.47 (0.28)[1]	0.44 (0.25)[1]	0.40 (0.25)[1]	0.49 (0.27)[1]	0.41 (0.29)[1]	0.50 (0.30)[1]	0.25 (0.34)[1]	0.50 (0.32)[1]	0.32 (0.29)[1, 3]
two and more[3]	0.67 (0.32)[1]	0.70 (0.32)[1]	0.63 (0.32)[1]	0.70 (0.32)[1]	0.74 (0.37)[1]	0.66 (0.33)[1]	0.63 (0.38)[1]	0.54 (0.33)[1]	0.66 (0.31)[1]	0.71 (0.38)[1, 2]
Literacy of spouse	0.71	0.85	0.53	0.76	0.44	0.76	0.49	0.70	0.62	0.81
Diploma[1]	0.46 (0.27)	0.50 (0.29)	0.55 (0.29)	0.37 (0.30)	0.54 (0.25)	0.40 (0.32)	0.56 (0.30)	0.24 (0.32)	0.50 (0.36)	0.37 (0.31)
BS[2]	0.37 (0.28)	0.42 (0.29)	0.40 (0.31)	0.36 (0.29)	0.40 (0.30)	0.35 (0.31)	0.38 (0.32)	0.24 (0.34)	0.42 (0.33)	0.31 (0.29)
MS[3]	0.45 (0.28)	0.50 (0.28)	0.47 (0.33)	0.45 (0.31)	0.50 (0.31)	0.45 (0.32)	0.47 (0.34)	0.30 (0.35)	0.54 (0.30)	0.36 (0.33)
Doctorate[4]	0.42 (0.32)	0.44 (0.35)	0.46 (0.32)	0.44 (0.34)	0.43 (0.35)	0.40 (0.34)	0.47 (0.38)	0.34 (0.36)	0.45 (0.33)	0.32 (0.33)
job of spouse	0.29	0.41	0.62	0.14	0.17	0.48	0.30	0.28	0.69	0.24
Clerk[1]	0.31 (0.25)	0.35 (0.27)	0.36 (0.25)	0.29 (0.27)	0.33 (0.30)	0.30 (0.29)	0.32 (0.29)	0.17 (0.27)	0.38 (0.29)	0.23 (0.30)
Non-governmental[2]	0.48 (0.28)	0.52 (0.30)	0.49 (0.33)	0.41 (0.30)	0.53 (0.27)	0.45 (0.34)	0.50 (0.30)	0.40 (0.38)	0.50 (0.31)	0.40 (0.31)
University student[3]	0.44 (0.32)	0.46 (0.35)	0.47 (0.34)	0.48 (0.34)	0.48 (0.35)	0.42 (0.34)	0.48 (0.38)	0.31 (0.38)	0.48 (0.36)	0.35 (0.31)
Housewife[4]	0.39 (0.28)	0.44 (0.29)	0.46 (0.30)	0.31 (0.26)	0.40 (0.31)	0.33 (0.32)	0.44 (0.34)	0.26 (0.30)	0.44 (0.34)	0.30 (0.28)
Residence	<0.001	<0.001	0.001	0.001	0.001	0.006	<0.001	0.001	<0.001	<0.001
Own personal[1]	0.36 (0.26)[3]	0.39 (0.30)[3]	0.38 (0.30)[2]	0.36 (0.29)	0.39 (0.30)	0.36 (0.31)	0.36 (0.30)[2]	0.23 (0.30)[2]	0.42 (0.30)[3]	0.28 (0.29)
Rented[2]	0.47 (0.31)[3]	0.47 (0.33)[3]	0.54 (0.33)[1, 3]	0.47 (0.36)[3]	0.51 (0.31)[3]	0.43 (0.34)[3]	0.58 (0.33)[1, 3, 4]	0.31 (0.38)[1, 3]	0.52 (0.33)[3]	0.40 (0.33)[3]
Dormitory[3]	0.25 (0.25)[1, 2]	0.25 (0.28)[1,2,4]	0.31 (0.31)[2]	0.27 (0.32)[2]	0.29 (0.30)[2]	0.26 (0.28)[2]	0.26 (0.29)[2]	0.12 (0.23)[2]	0.25 (0.32)[1, 2, 4]	0.19 (0.25)[2]
With parents[4]	0.34 (0.28)	0.36 (0.31)[3]	0.41 (0.32)	0.34 (0.32)	0.37 (0.33)	0.33 (0.32)	0.34 (0.31)[2]	0.21 (0.30)	0.39 (0.33)[3]	0.27 (0.29)
Private car	0.21*	0.39	0.21	0.37	0.14	0.03	0.76	0.65	0.70	0.89
Yes[1]	0.30 (0.26)	0.32 (0.29)	0.35 (0.31)	0.31 (0.30)	0.33 (0.30)	0.28 (0.30)	0.33 (0.32)	0.18 (0.28)	0.34 (0.30)	0.23 (0.27)
No[2]	0.34 (0.28)	0.35 (0.31)	0.39 (0.33)	0.35 (0.33)	0.38 (0.32)	0.34 (0.31)	0.34 (0.32)	0.19 (0.29)	0.37 (0.35)	0.28 (0.29)
Cell phone	0.20*	0.20	0.41	0.29	0.31	0.11	0.09	0.12	0.56	0.02
Yes[1]	0.31 (0.27)	0.33 (0.30)	0.37 (0.32)	0.32 (0.31)	0.35 (0.31)	0.31 (0.30)	0.33 (0.31)	0.18 (0.28)	0.35 (0.32)	0.24 (0.28)

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	GSI	Somatization	Obsessive-Compulsive	Interpersonal sensitivity	Depression	Anxiety	Hostility	Phobic Anxiety	Paranoid ideation	Psychosis
Economic status	0.08	0.70	0.11	0.02	0.054	0.009	0.20	0.02	0.40	0.07

Weak[1]	0.39 (0.33)	0.38 (0.37)	0.40 (0.37)	0.44 (0.38)[3]	0.43 (0.36)	0.41 (0.35)	0.40 (0.37)	0.29 (0.34)[2, 3]	0.40 (0.38)	0.34 (0.36)
Fair[2]	0.33 (0.26)	0.34 (0.29)	0.39 (0.31)	0.33 (0.30)	0.36 (0.31)	0.33 (0.30)	0.34 (0.30)	0.17 (0.27) [1]	0.37 (0.33)	0.26 (0.27)
Good[3]	0.28 (0.25)	0.31 (0.29)	0.32 (0.30)	0.27 (0.29)[1]	0.29 (0.29)	0.25 (0.29)	0.29 (0.30)	0.16 (0.27) [1]	0.31 (0.30)	0.21 (0.26)
Satisfaction with private life	0.04	0.49	0.31	0.07	0.02	0.005	0.35	0.17	0.66	0.15
Weak[1]	0.38 (0.28)[3]	0.38 (0.32)	0.41 (0.34)	0.41 (0.35)	0.44 (0.32)[3]	0.40 (0.31)[3]	0.37 (0.32)	0.24 (0.32)	0.39 (0.34)	0.31 (0.30)
Fair[2]	0.32 (0.29)	0.33 (0.32)	0.38 (0.33)	0.33 (0.32)	0.36 (0.33)	0.33 (0.33)[3]	0.34 (0.33)	0.19 (0.29)	0.36 (0.34)	0.26 (0.29)
Good[3]	0.29 (0.24)[1]	0.33 (0.26)	0.34 (0.28)	0.28 (0.29)	0.31 (0.28)[1]	0.31 (0.28)[1, 2]	0.31 (0.30)	0.16 (0.27)	0.34 (0.30)	0.22 (0.26)
Satisfaction with studying discipline	<0.001	<0.001	<0.001	0.002	0.002	0.001	<0.001	<0.001	0.003	0.001
Weak[1]	0.52 (0.30)[2, 3]	0.52 (0.34)[2, 3]	0.59 (0.33)[2, 3]	0.51 (0.34)[2, 3]	0.52 (0.33)[2, 3]	0.49 (0.32)[2, 3]	0.62 (0.33)[2, 3]	0.38 (0.38)[2, 3]	0.54 (0.35)[2, 3]	0.45 (0.34)[2, 3]
Fair[2]	0.31 (0.28)[1]	0.30 (0.30)[1]	0.36 (0.33)[1]	0.31 (0.32)[1]	0.36 (0.32)[1]	0.31 (0.31) [1]	0.31 (0.31)[1]	0.19 (0.30)[1]	0.34 (0.33)[1]	0.24 (0.28)[1]
Good[3]	0.30 (0.25)[1]	0.34 (0.29)[1]	0.34 (0.29)[1]	0.31 (0.29)[1]	0.32 (0.29)[1]	0.29 (0.29) [1]	0.30 (0.29)[1]	0.15 (0.24)[1]	0.34 (0.31)[1]	0.23 (0.27)[1]

*Mann–**Whitney** U test

Medical students had a higher level of stress and depression than other groups of similar age, non-medical undergraduates or peers not in higher education (8). In our study nearly 14% of medical students had GSI scores above the threshold; this result is in line with Nojomi's finding (12) otherwise some Iranian studies among medical students showed lower mental disorder prevalence than our study (9, 18-21). While studies in other countries showed the prevalence of medical student's mental illness from 20% to 40% (5-8, 22). The most prevalent forms of mental distress in our study were hostility, anxiety but in Tabrizi-Zade et al., and Hosseini et al., studies in Iran paranoid ideation, depression and hostility were the most prevalent disorders (9, 10).

According to our study there was no significant difference in GSI score between genders, this result is in line with Tabrizi-Zade et al., and Sadeghian et al., studies in Iran (9, 19) and Omigbodun et al., in Nigeria, Sreeramareddy et al., in Nepal (6, 23). In some studies in Iran female medical students had significantly higher scores (10, 12, 14, 18, 20, 21). In a study in 2011 in the United States, using SCL-90-R, male students were significantly more stressed as compared to female students (5).

Study suggests that mental disorders were more prevalent in divorced and separated individuals (17). Analysis of our study showed no significant difference of GSI scores between different groups of marital status. This result is supported in similar studies by Tabrizi-Zade et al., Nojomi et al., and Shariati et al., (9, 12, 20). On the other hand, Sadeghian et al., showed that mental health status was correlated with marital status and married students had lower scores (19).

There was significant association between number of children and GSI in our study, but Mousavi et al., found no association between number of children and mental status (24).

Satisfaction with studying discipline and satisfaction with private life can affect mental health of medical students. In Nojomi et al., study participants with good overall satisfaction, scored lower than the other groups on all subscales of SCL-90-R except for paranoia. There was significant association between six sub scales and satisfaction with studying medicine (12). Our results showed significant correlation between satisfactions with studying medicine with GSI scores.

Students who lived in dormitory had lower GSI score, but other studies in Iranian medical students showed no association between type of residence and mental status (9, 12, 25).

There was significant association between high economic status and GSI scores in our study, but in another study of Iranian medical student's mental health using SCL-90-R questionnaire, there was no significant association between economic status and GSI scores (9). In Shariati et

al., study using GHQ-28 questionnaire, distress was associated with very poor financial status (OR: 18.0) (20).

The strength of our study had a high response rate of participants. Near all the students completed the questionnaire. Cross sectional nature of our study is one of the limitations, so we could not assess the temporal direction of mental disorders of medical students. Mental health of medical students is very important, because they are future doctors and are responsible for public health. Better mental health of students with good economic status shows the importance of fulfilling financial needs of young doctors to achieve the goals of medical education. Lower mental distress in students who lived in dormitory showed that supporting students by providing suitable amenities is very important.

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