ORIGINAL ARTICLE

Investigating stress, depression, and anxiety levels in students at medical universities in southeastern Iran during the covid-19 epidemic in 2020

Mehrnoosh Yazdanpanah[1], Abedin Iranpour[2], Gholamabbas Nekoonam[3], Somayeh Alizadeh[1]

[1] Department of Health Education and Promotion, School of Public Health, Kerman University of Medical Sciences, Kerman, IRAN
[2] HIV/STI Surveillance Research Center, and WHO Collaborating Center for HIV Surveillance, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, IRAN
[3] Department of Environmental Health and director of student affairs, Kerman University of Medical Sciences, Kerman, IRAN

Corresponding Author Somayeh Alizadeh **Email:** alizade2009@yahoo.com

ABSTRACT

Psychological problems in the general public and among students become common following the epidemic of infectious diseases such as Covid-19. This study investigated the rates of stress, anxiety, and depression and the factors affecting them during the epidemic of Covid-19 disease in students at medical universities in southeastern Iran.

This cross-sectional study was conducted in 2020. A total of 390 students were selected through convenience sampling from medical universities in south-eastern Iran (Kerman, Bandar Abbas, Zahedan, and Birjand) as a sample size. The instrument used in this study was a DASS-21 questionnaire to measure depression, anxiety, and stress. Data were analyzed using SPSS16 software. The mean age of participants was 21.73±4.03. The mean scores for depression, anxiety, and stress were 13.95 ± 10.23, 11.38 ± 08.92, and 19.15 ± 09.67, respectively. Overall, 62.56% of students suffered from depression, 62.82% from anxiety, and 62.56% from stress. Among the demographic variables, age and education had a significant relationship with all three subscales (p <0.001), and marital status had a significant relationship with the levels of anxiety and stress.

The Covid-19 epidemic was recognized as a reason for higher rates of depression, stress, and anxiety in students at medical universities in southeastern Iran. Appropriate planning during an epidemic of infectious diseases for prevention and treatment interventions in the field of mental health promotion for medical students seems necessary.

Key words:
stress; anxiety; depression; medical students; covid-19

INTRODUCTION

Stress is one of the most important complications and common problems in infectious diseases such as Covid-19, and the population is affected by the disease, so assessing the psychological crisis in such situations is crucial.[1, 2] In Covid-19 emergencies, both individual and social benefits were directly affected, causing an increase in psychological pressures on society.[3] Covid-19 put many restrictions on travel, social relationships, and daily activities, which created occupational and financial problems.[4] The high rate of secondary attacks of this disease and the fear of death among the elderly and those with underlying diseases increased stress in most communities.[5, 6] Students, as the future of the country, also experienced the stress, anxiety, and depression brought on by this disease. Long-term stress has detrimental effects on students, such as the impairment of effective learning and thinking power,[7, 8] 'diminished self-confidence, poor control over the learning process, and lower grades.[9] Furthermore, stress can lead to high-risk behaviors such as smoking, alcohol abuse, and drug abuse in students.[10-12] Previous studies have reported that the presence of anxiety during the academic period can cause problems in later stages of life.[13] A person suffering from anxiety may experience physical and psychological injuries, and high levels of anxiety can have consequences such as lack of sleep, psychological disorders, and a weakened immune system.[14-16]

At the time of the Covid-19 disease epidemic, studies were conducted on nursing students and showed the effects of this disease on increasing depression, anxiety, and stress among nursing students.[17] Other studies identified factors that protected against student anxiety during the outbreak of Covid-19, including living in urban areas, living with parents, and having a stable family income.[18]

Attention to psychological problems in different individuals and groups, including adolescents and young people,[10, 19] women,[7] and people with chronic diseases,[9] has always been emphasized by researchers, but at the time of the outbreak of Covid-19, it was even more important to pay attention to such issues. One highly important group is students at medical universities. Many studies have investigated psychological status during the Covid-19 epidemic in Iran, but few studies have examined the psychological problems of medical university students. Those that did either focused only on students in one field (mostly medical and nursing students),[14] and were conducted in only one medical university,[11] or sampled students in fields other than medical sciences.[13] As all students of different majors in medical universities are more affected by this disease because of their educational situation and greater attendance at health centers, the present study investigated stress, anxiety, depression rates and the factors affecting them during the Covid-19 epidemic in students at medical universities in southeastern Iran. The findings will improve our understanding of the psychological impact of exposure to an outbreak of a fast-spreading, life-threatening infectious disease and increase our preparation to respond to infectious diseases that can become pandemic in the future.

MATERIALS AND METHODS

This was a cross-sectional study and was done based on the descriptive-analytical method. Data were collected in August and September 2020. The sample size was 385 according to the Cochrane formula by considering the following

assumptions; Z equaled 1.96, 95% confidence level, the margin of error of 5% and to calculate the maximum sample size, p and q values were considered 0.5. The sampling method was convenience sampling.

The total number of medical students in southeastern Iran is 10,850. A total of 390 students from medical universities in southeastern Iran (Kerman, Bandar Abbas, Zahedan, and Birjand) in all levels (BSc, MSc and Ph.D) and fields of study participated in this study. Among the inclusion criteria was being a student in a medical university in southeastern Iran and exclusion criteria were having a history of mental disorder. Data were collected using a questionnaire of demographic factors (including age, sex, level of education, accommodation in a dormitory, and marital status) and DASS-21. This questionnaire has 7 questions in each of the areas of stress, anxiety, and depression.

The questionnaire also evaluates the severity of depression, anxiety, and stress in 5 areas with the classification of the severity of Depression, Anxiety and Stress (DAS) symptoms listed in Table 1.

Table 1: Classification of the severity of DAS symptoms

Intensity	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
mild	10-13	8-9	15-18
moderate	14-20	10-14	19-25
severe	21-27	15-19	26-33
extremly severe≤	28	20	33

The validity and reliability of this questionnaire are also confirmed and in 2005 a study was conducted on 1070 men and women by Sahebi et al. in Iran. The Cronbach's alpha of this test for the DASS scales was announced as 0.77, 0.79, 0.78, respectively[20]. In the present study, the reliability was obtained from calculating Cronbach's alpha coefficient equal to 0.89. In this study, demographic variables (age, gender, marital status, level of education and accommodation in a dormitory) were considered as independent variables.

The questionnaire was provided online and on Mafda virtual networks, Telegram, Whats app and other student class groups. The data obtained from the questionnaires were entered into SPSS 16 software and analyzed. Descriptive statistics including absolute frequency, frequency distribution table, mean and standard deviation, independent sample t-test, Oneway ANOVA, Tukey and Post Hoc tests were used to analyze the data.

Ethical considerations

At the beginning of the questionnaire, to maintain ethical considerations, all the required information about the purpose of the research was given and the confidentiality of the participants' information was also assured. This research has been registered in Kerman University of Medical Sciences with the code of ethics IR.KMU.REC.1399.312.

RESULTS

The mean age of students was 21.73±4.03. The minimum age of the participants was 19 years and the maximum was 47 years. Of the 390 students participating in the present study, 61.8% were females. The majority of single people were 86.9% and were studying at the undergraduate level (Table 2).

Table 2: Demographic information of the participants in the study

Variable	Group	Number	Percent
Age	≤ 21	264	**67.7**
	22-26	104	**26.7**
	27≥	21	**5.4**
Gender	Female	241	**61.8**
	Male	145	**37.2**
Marital Status	Married	51	**13.1**
	Single	339	**86.9**
Educational level	Bachelor	287	**73.6**
	Master	61	**15.6**
	PHD	38	**9.7**
Accommodation in a	Yes	310	**79.5**
Dormitory	No	81	**20.5**

The results showed that the mean and standard deviation of depression was 13.95±10.23.

This subscale had a significant relationship with age and education level. Depression rates were higher among doctoral students, women, single people, and dormitory residents (Table 3).

Table 3: Mean and Standard Deviation of Depression and its Relationship with Demographic variables

Variable	Group	Mean±SD	sign	Normal	Mild	Moderate	Severe	Extremely severe
Age	21≤	13.18±10.12	0.001	96(36.4%)	56(21.1%)	51(19.3%)	33(12.5%)	**28(10.6%)**
	22-26	12.68±9.56		48(46.2%)	4(3.8%)	32(30.8%)	8(7.7%)	**12(11.5%)**
	27 ≥	21.6±12.02		1(4.8%)	8(38.1%)	0(0%)	8(38.1%)	**4(19%)**
Gender	Female	14.08±9.68	0.797	82(34%)	46 (19.1%)	55(22.8%)	33(13.7%)	**25(10.4%)**
	Male	13.82±11.22		63(43.4%)	18 (12.4%)	29(20%)	16(11%)	**19(13.1%)**
Marital Status	Married	13.68±12.62	0.842	30(58.8%)	4(7.8%)	1(2%)	8(15.7%)	**8(15.7%)**
	Single	13.98±9.84		115(33.9%)	64(18.9)	83(24.5%)	41(13.1%)	**36(10.6%)**
Educational level	Bachelor	12.98±9.96	0.001	120(41.8%)	48(16.7%)	62(21.6%)	27(9.4%)	**27(9.4%)**
	Master	14.12±9.14		23(37.7%)	6(9.8%)	17(27.9%)	9(14.8%)	**(9.8%)6**
	PHD	19.72±11.82		2(5.3%)	14(36.8%)	5(13.2%)	9(23.7%)	**8(21.1%)**
Accommodation in a Dormitory	Yes	14.04±10.32	0.693	116(37.4%)	52(16.8%)	61(19.7%)	45(14.5%)	**36(11.6%)**
	No	13.54±9.96		29(36.3%)	16(20%)	23(28.8%)	4(5%)	**8(10%)**

The mean and standard deviation of the anxiety subscale was 11.38 ± 8.92.

This subscale showed a significant relationship with the variables of age, marital status, and education level. The mean and standard deviation of anxiety was higher in the age group over 27 years than in other age groups. Married people experienced more stress than single people, and Ph.D. students were found to have a higher level of anxiety than others (Table 4).

Table 4: Mean and Standard Deviation of Anxiety and its Relationship with Demographic variables

Variable	Group	Mean±SD	sign	Normal	Mild	Moderate	Severe	Extremely severe
Age	21≤	11.46±8.74	<0.001	95(36%)	25(9.5%)	79(29.9%)	21(8%)	**44(16.7%)**
	22-26	9.9±8.48		47(45.2%)	13(12.5%)	19(18.3%)	0(0%)	**25(24%)**
	27≥	17.7±10.8		4(19%)	0(0%)	4(19%)	8(38.1%)	**5(23.8%)**
Gender	Female	11.72±8.6	0.334	88(36.5%)	25(10.4%)	58(24.1%)	23(9.5%)	**47(19.5%)**
	Male	10.8±9.54		58(40%)	13(9%)	41(28.3%)	6(4.1%)	**27(18.6%)**
Marital Status	Married	10.98±8.74	0.021	135(39.8%)	38(11.2%)	79(23.3%)	21(6.2%)	**66(19.5%)**
	Single	14.06±9.68		11(21.5%)	0(0%)	24(47.1%)	8(15.7%)	**8(15.7%)**
Educational level	Bachelor	10.36±8.34	<0.001	119(41.5%)	29(10.1%)	80(27.9%)	14(4.9%)	**45(15.7%)**
	Master	12.38±8.54		16(26.2%)	9(14.8%)	18(29.5%)	2(3.2%)	**16(26.2%)**
	PHD	17±11.64		11(28.9%)	0(0%)	5(13.2%)	9(23.7%)	**13(34.2%)**
Accommodation in a Dormitory	Yes	11.18±8.8	0.393	122(39.4%)	25(8.1%)	81(26.1%)	21(6.8%)	**61(19.7%)**
	No	12.14±9.36		24(30%)	13(16.3%)	22(27.5%)	8(10%)	**13(16.3%)**

The mean and standard deviation of the scores for the stress subscale was 19.15± 9.67.

Stress was shown to have a significant relationship with age, marital status, and education level. The mean and standard deviation of stress was higher in the age group over 27 years than in other age groups and in married people than single people. Ph.D. students had a higher level of stress than other students (Table 5).

Table 5: Mean and Standard Deviation of Stress and its Relationship with Demographic variables

| Variable	Group	Mean±SD Group	sign	Normal	Mild	Moderate	Severe	Extremely severe
Age	21≤	19.02±9.02	<0.001	98(37.1%)	40(15.2%)	59(22.3%)	45(17%)	**22(8.3%)**
	26-22	17.34±10.50		44(42.3%)	10(9.6%)	18(17.3%)	28(26.9%)	**4(3.8%)**
	27≥	26.94±9.9		4(19%)	0(0%)	5(23.8%)	8(38.1%)	**4(19%)**
Gender	Female	19.46±8.82	0.310	75(31.1%)	37(15.4%)	68(28.2%)	45(28.2%)	**16(6.6%)**
	Male	18.44±10.98		71(49%)	14(9.7%)	14(9.7%)	32(9.7%)	**14(9.7%)**
Marital Status	Married	22.54±9.42	0.007	14(27.5%)	1(2%)	20(39.2%)	8(15.7%)	**8(15.7%)**
	Single	18.64±9.6		132(38.9%)	50(14.7%)	62(18.3%)	73(21.5%)	**22(6.5%)**
Educational level	Bachelor	18.18±9.2	<0.001	118(41.1%)	39(13.6%)	54(18.8%)	58(20.2%)	**18(6.3%)**
	Master	19.7±9.44		18(29.5%)	12(19.7%)	13(21.3%)	14(23%)	**4(6.6%)**
	PHD	24.62±11.42		10(26.3%)	0(0%)	15(39.5%)	5(13.2%)	**8(21.1%)**
Accommodation in a Dormitory	Yes	18.86±9.74	0.248	118(38.1%)	45(14.5%)	64(20.6%)	61(19.7%)	**22(7.1%)**
	No	20.26±9.34		28(35%)	6(7.5%)	18(22.5%)	20(25%)	**8(10%)**
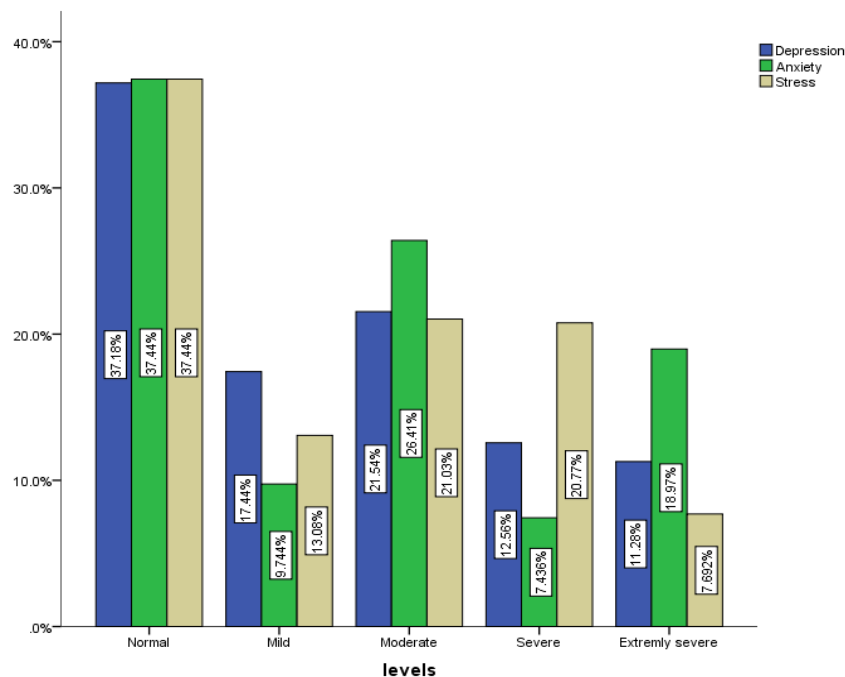
Figure 1: Comparison of the frequency distribution of participants with stress, anxiety, and depression by severity

According to Figure 1, the percentage of students in different subscales of the questionnaire was almost equal at the normal level, but at the mild level, the percentage of depression was higher than the other two subscales. At the average level, however, the percentage of anxiety in students was higher. At the severe level, the stress level was significantly higher, while anxiety was higher among students at the extremely severe level.

DISCUSSION

The present study showed that 62.56% of students reported mild to extremely severe stress symptoms, while another study conducted at another medical sciences university in Iran reported a higher rate at the natural level (58.8%) than at other levels.[21] Another study conducted on nursing students showed that the highest frequency distribution of stress was related to the normal level (84.21%),[22] while another study reported the rate of stress in medical students as 47.1%.[23] Ramon et al. reported a 34% prevalence of stress in students during their study.[5]

Previous studies have also considered the role of the Covid-19 pandemic in increasing stress.[24-26]

The anxiety subscale in the current study showed a frequency of 62.82% among students, while another study conducted in Iran reported this rate as 28.7%. A study of medical students in Malaysia stated that 33% of students reported symptoms of varying degrees of anxiety.[27] Ramon et al. reported an anxiety rate of 23.6%.[5] Azim and Baig evaluated anxiety among medical students and estimated its frequency rate to be 72%.[28] Their research indicated most students had moderate levels of anxiety, while the present study observed higher levels of severe and extremely severe anxiety than in the study by Azim and Baig.

The current results showed that 62.56% of students had different levels of depression. In a study conducted on nursing students in Iran, this rate was equal to 21.9%.[22] The study of Torabi et al. reported a prevalence of moderate to severe depression in dental students of 35.7%,[29] while this rate in the present study was equal to 52.7%, which indicates that this rate is higher in more serious levels of depression. In a study of final year medical students in Pakistan, this figure was 57.6%.[30] Yet another study reported the rate to be 71%.[28]

In the present study, the frequency distribution for the three studied subscales was significantly higher at moderate to very severe levels than in all other studies conducted both in Iran and abroad before the Covid-19 epidemic. Because this study was conducted only during the epidemic and not before, it is difficult to say whether these psychological factors were caused by the epidemic or already existed. During a study of nursing students at the time of the Covid-19 epidemic, however, most people had normal levels of stress, anxiety, and depression, which is inconsistent with the present study. Reasons for this result may be differences in the study populations and sample sizes.[17]

The biological factors of age and gender can affect the mental health of individuals. In the present study, male and female students did not differ in terms of the levels of variables studied, while other studies have stated that the prevalence of stress, anxiety, and depression is higher in female students than in males. Such a result has been explained by the biopsychological characteristics of women, because women are more vulnerable to stressful events.[31, 32] These discrepancies in findings can be explained by differences in types of study and sample sizes, which can be influenced by various confounding factors such as country of study, nationality of subjects, degree of studies, and socioeconomic status.

Age can be another factor associated with stress, anxiety, and depression. In the current study, people over the age of 27 who had a Ph.D. had higher rates of stress, anxiety, and depression. Previously, Wahed et al. also pointed out the relationship between age, stress, and anxiety in students.[33] Deo et al. also noted the significant association of age, depression, anxiety, and marital status with anxiety in a study on nursing students during the Corona crisis.[17] Along with the present study, Shete et al. noted higher levels of stress in postgraduate medical students.[34] One of the reasons for the higher rates of these three subscales in Ph.D. students may be the fear of falling behind in many academic activities and delays in graduation. Because many doctoral students have practical projects and work on humans, the outbreak of Covid-19 restricted opportunities for practical activities. Older students may have symptoms of psychological problems because of uncertainty about their future employment. Nonetheless, some studies have shown that younger students report higher levels of psychological problems compared to older students.[31, 35] These studies were conducted before the Covid-19 epidemic, and it may be argued that the prevalence of cognitive problems in young adults may come about from changes in their living environment, problems in adapting to a new life, or being away from family.

The current study observed more stress and anxiety among married people than single people. Chernomas and Shapiro also stated that students with family responsibilities are more likely to develop stress, anxiety, and depression during their studies.[36] This may be explained by the need for medical students to attend hospital and healthcare settings more often because of clinical situations, internships, residencies, and practical courses. Therefore, they are more likely to contract the disease and transmit it to their families;

it is also more difficult for a married person to quarantine and follow health protocols in terms of psychological effects.

LIMITATIONS

One of the limitations of the present study was the study population, which consisted only of cyberspace users. Another limitation was the convenience sampling method, which certainly limits the generalization of research findings. On the other hand, most of the participants were women. It is suggested that future studies consider a better fit for gender in the selection of samples.

RECOMMENDATIONS

It is recommended that new survey technology be used to identify students who are at higher risk for stress, anxiety and/or depression, and mechanisms are needed to address broader aspects of health so as to more easily identify students who may benefit from psychological guidance. One strategy could be to provide counseling services and meetings or workshops in any of the regional hospitals or health centers that are easily accessible to give students the opportunity to seek help anonymously.

CONCLUSION

The current results showed that at the time of the study, students in southeastern Iran experienced a high prevalence of depression, stress, and anxiety. Stress and anxiety were higher in people over 27 years of age, married, and those studying a Ph.D. program. Depression also showed a higher rate among older people and Ph.D. students. Therefore, managing the conditions caused by Covid-19 seems to be necessary to improve students' academic performance

and their overall productivity and to reduce psychological problems.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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