Health Tech Asmnt Act. 7(3). doi: 10.18502/htaa.v7i3.14212

Research Article

Effect of Stress Management Training on the Mental Health of Medical Students and Interns Training Centers During the Pandemic: An Intervention Study

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Received 2023 April 28; Accepted 2023 May 22.

Abstract

Background: Medical students, as a part of the first line of combating COVID-19, have been exposed to harm caused by mental disorders.

Objectives: This study investigated how stress management training affects the mental health of medical students and interns during the COVID-19 pandemic.

Methods: sixteen training and internship students of Birjand University of Medical Sciences from 2020-2021 were included in this intervention study. The intervention group completed the stress management training course in 6 sessions. Mental health dimensions were collected with the SCL90 questionnaire before and after intervention in both groups. SPSS 22 software and Mann-Whitney U-test, Wilcoxon, Chi-square, and Fisher's exact test were utilized for data analysis.

Results: The basic data showed no significant differences between groups ($P > 0.05$). After the intervention, the mean scores of physical complaint, obsessive-compulsive, interpersonal relations, depression, anxiety, aggression, fear, paranoid and psychotic dimensions in the intervention group significantly decreased ($P < 0.05$). In controls, the obsessive-compulsive, depression, anxiety, and aggression dimensions significantly decreased ($P < 0.05$). However, in controls, there was no significant difference in the mean score of other dimensions before and after intervention ($P > 0.05$). Before the intervention, the frequency distribution of various levels of sensitivity to interpersonal relationships in the two studied groups was the same ($P > 0.05$); after the intervention, these levels were significantly different between groups ($P < 0.05$). After intervention, the control group had a higher frequency distribution of individuals with degrees of depression ($P < 0.05$).

Conclusions: The mental health of medical internship students during a crisis can be improved by stress management training, which reduces anxiety and depression. Therefore, stress management courses are recommended in stressful situations.

Keywords: Education; Stress Management; Mental Health; Student; Corona

1. Background

An emergency in global health in all countries of the world was caused by the unique spread of COVID-19 and its high transmission speed within a few months (1). This disease causes public health concerns and the occurrence of various psychological diseases (2, 3). Healthcare workers are the front line of fighting infectious diseases and COVID-19; they are the first to be exposed to this virus. So that, anxiety related to COVID-19 was experienced by 42.5% of Iranian dentists (4). During the COVID-19 epidemic in China, medical health workers had a higher risk of mental disorders than non-medical health workers (5). A significant proportion of health workers reported symptoms of anxiety, depression, and insomnia, as revealed by study findings in Nepal (6). In a systematic review in 2020, moderate to intense COVID-19-associated mental disorders were reported by a significant proportion of dentists (7). It was found that there is a significant correlation between physical illness and psychiatric disorders related to anxiety associated with COVID-19 (4). Also, the quality of healthcare workers' activities and services can be severely affected by psychological disorders like anxiety, fear, stress, and stigma (8, 9).

In addition to being concerned about the COVID-19 impact on reducing the learning of job skills, medical

students, as active participants in the fight against COVID-19, along with other healthcare workers, were exposed to various mental disorders (10-13), and were less likely to seek support (14, 15).

For all people influenced by the highly contagious COVID-19 virus, it is better to use appropriate psychotherapy methods such as stress management training using modern facilities such as videoconferencing and online programs. According to research, these methods in the treatment of anxiety, depression, and PTSD are effective (16-18).

Given that in a communicable disease epidemic, health workers and medical students are located at the first line of facing the infection, and they suffer high mental pressure. It's important to prioritize medical students' mental health and devise a plan to enhance it.

2. Objectives

This research assessed the effect of stress management training on the mental health of medical students and interns at Birjand City Medical Training Center during the COVID-19 pandemic in the academic year 2021.

3. Methods

3.1. Study Type and Statistical Population

The population of this randomized intervention study was the students of the training and internship levels studying at Birjand University of Medical Sciences throughout the 2020 - 2021 academic year.

3.2. Sample Size and Sampling Method

Shahraviet al.'s study (19) results were used to determine the sample size, and using Cochran's mean difference formula, the study population consisted of 60 people (30 in each group). It was then split into intervention and control groups randomly.

3.3. Inclusion and Exclusion Criteria

Internship students of Birjand University of Medical Sciences who had no history of depression and were accepted to take part in the study included in the study and uncomplete questionnaire, guest or transfer students from other universities, re-studying in other fields and students who had taken study leave, they were omitted from the study.

3.4. Gathering Data Tools and Methods

Students' mental health was evaluated using the SCL90 questionnaire. Dragotiset et al. introduced the SCL90 questionnaire. (20) in 1973 and was finalized in 1976. Each SCL90 questionnaire item's answer is measured using a scale of 5 points of discomfort (none to severe). Scoring and interpretation of the test are based on three indicators of the general quotient of morbid symptoms, the measure of discomfort quotient, and the sum of morbid symptoms. The reliability of the 9 dimensions of the SCL90 questionnaire was measured using two reliability calculation methods, the retest method.

To calculate the internal consistency of the test, which was conducted on 219 people in the United States to measure the stability and uniformity of the questions, alpha coefficients and Coder Richardson 200 were used. The results of all the obtained coefficients for 9 dimensions were completely satisfactory (21).

To calculate the nine dimensions of the questionnaire, the scores of the questions of different dimensions were added together: Physical complaints dimension (12 questions), obsessive-compulsive dimension (10 questions), sensitivity in interpersonal relationships dimension (9 questions), depression dimension (13 questions), anxiety dimension (10 questions), aggression dimension (6 questions), fear and morbidity dimension (7 questions), paranoid dimension (6 questions) and psychotic dimension (10 questions).

In addition, to obtain the levels of different dimensions of the SCL90 questionnaire, the average score for each dimension is calculated by multiplying the number of questions. If the average score is below 1, there is no mental disorder; between 1 and 2, with a mild mental disorder; between 2 and 3, with a moderate mental disorder or significant and between 3 and 4 were considered serious or severe mental disorders (22).

The validity of this test has been determined through several studies. In the context of concurrent validity, Dragotis and Wikelzorak (1976) conducted this test together with the MMPI on 19 volunteer subjects (20).

The Persian form of the questionnaire mentioned was validated in Iran for its validity and reliability by Akhavan Abeiri et al. in 2018, and all dimensions of the questionnaire had a Cronbach's alpha coefficient above 0.75 (21).

3.5. Method of Conducting the Study

After justifying the students and completing the informed consent form, 60 eligible individuals were selected and were randomly divided into two study groups. Both groups completed the demographic checklist (age and gender) and the SCL90 questionnaire.

Then, the experimental group underwent a stress management training course of 6 sessions 45 minutes, 1 session per week (Table 1), taught by a specialized doctorate in education management and a master's degree in psychology. There was no intervention given to the control group during this period. Seven days after the

last session in the Corona department, the SCL90 questionnaire was completed again by both groups.

Table 1. Workshop Schedule for Students Participating in the Intervention Group

Session Number	Topic
1	Offering an introduction to the necessity and importance of training stress control skills, as well as defining stress, addressing the differences between people in how they deal with it, and the reasons behind them.
2	The physical, psychological, and behavioural effects of stress are analyzed in order to discuss how stress affects various body systems as a whole.
3	Finding mental and rational ways to handle stress, introducing problem-oriented and emotion-oriented methods as coping strategies, and exploring people's coping strategies in stressful situations.
4	Introducing the stages of coping with stress, focusing on the initial step of understanding your emotions, as well as developing study skills, test preparation, and time management.
5	Enhancing self-esteem, self-confidence, and coping with depression and anxiety.
6	Dealing with the 2nd step of stress control skills and remembering both long-term and short-term strategies.

3.6. Data Analysis

SPSS 22 software was utilized for data analysis. Central and dispersion indicators were used to report descriptive results. To verify the data's normality, the Kolmogorov-Smirnov test was employed. Analytical analysis was done by a 2-sided Mann-Whitney U-test, Paired Wilcoxon test, Chi-square test or Fisher's exact test at a significance level of $\alpha = 0.05$.

3.7. Ethical Considerations

This study was approved by the ethics committee of Birjand University of Medical Sciences (IR.BUMS.REC.1400.236). Furthermore, informed consent was obtained.

4. Results

This study included 60 medical students with 25 ± 0.83 (intervention) and 25.4 ± 1.06 (control) years of age, without significant differences between groups (P = 0.112). Also, the gender frequency distribution was not significantly different (P = 0.435) (Table 2).

Table 2. Comparison of Gender Frequency Distribution of People in the Two Studied Groups [a]

Group	Intervention	Control	Chi-square Test
Sex			
Male	19 (63.3)	15 (50)	X2 = 1.086, P = 0.435
Female	11 (36.7)	15 (50)	

[a] Values are presented as No. (%).

The intervention did not significantly alter the average scores of physical complaints, obsessive-compulsive disorder, interpersonal relationships, depression, anxiety, aggression, and fear (P > 0.05). After the intervention, the average scores of the paranoid and psychotic dimensions were not significant (P > 0.05). However, before the intervention, the intervention group had a significantly higher level than the control group (P < 0.05). In addition, after the intervention, the average dimensions of physical complaint, obsessive-compulsive, interpersonal relationships, depression, anxiety, aggression, fear, paranoid and psychosis in the intervention group and the dimensions of obsessive-compulsive, depression, anxiety and aggression compared to the beginning of the study significantly decreased in the control group (P < 0.05).

Furthermore, after intervention, the mean score of physical complaints, interpersonal relationships, fear, paranoia, and psychotic dimensions did not differ significantly compared to the beginning of the study in the control group (P > 0.05) (Table 3).

Table 3. Comparison of the Average of Different Dimensions of Mental Health Before and After the Intervention in the Two Studied Groups

Group and Dimension	Intervention	Control	P-Value, (Mann-Whitney U test)
Physical complaints (Somatization)			
Before intervention	7.16 ± 6.68	5.7 ± 4.41	0.393
After intervention	4.46 ± 5.08	5.56 ± 4.34	0.352

Wilcoxon signed-rank test	< 0.001	0.612	
Obsessive-compulsive			
Before intervention	11.03 ± 6.00	9.00 ± 4.33	0.247
After intervention	8.00 ± 3.88	8.00 ± 3.96	0.835
Wilcoxon signed-rank test	< 0.001	0.007	
Sensitivity in interpersonal relationships, (Interpersonal sensibility)			
Before intervention	8.33 ± 5.07	5.76 ± 4.40	0.095
After intervention	6.16 ± 4.62	5.76 ± 4.40	0.835
Wilcoxon signed-rank test	< 0.001	0.204	
Depression			
Before intervention	12.16 ± 9.84	10.96 ± 7.36	0.824
After intervention	8.10 ± 7.20	9.80 ± 6.92	0.235
Wilcoxon signed-rank test	< 0.001	0.013	
Anxiety			
Before intervention	6.13 ± 5.51	5.30 ± 3.08	0.829
After intervention	4.50 ± 4.38	4.56 ± 3.23	0.526
Wilcoxon signed-rank test	< 0.001	0.013	
Aggression (Anger-hostility)			
Before intervention	4.26 ± 3.89	2.70 ± 2.05	0.125
After intervention	3.10 ± 2.95	0.50 ± 1.91	0.161
Wilcoxon signed-rank test	< 0.001	0.006	
Fear (Phobic-anxiety)			
Before intervention	3.70 ± 4.81	2.80 ± 2.44	0.928
After intervention	2.76 ± 3.61	2.36 ± 2.51	0.769
Wilcoxon signed-rank test	0.006	0.176	
Paranoid ideation			
Before intervention	7.56 ± 3.82	5.10 ± 2.68	0.011
After intervention	5.06 ± 2.93	4.53 ± 2.55	0.617
Wilcoxon signed-rank test	< 0.001	0.066	
Psychoticism			
Before intervention	7.76 ± 5.39	5.36 ± 2.52	0.045
After intervention	8.33 ± 4.35	5.40 ± 2.44	0.665
Wilcoxon signed-rank test	0.001	0.974	

a Values are presented as Mean ± SD.

The frequency distribution of different levels of physical complaint, obsessive-compulsive, anxiety, morbid fear, aggression, paranoia and psychosis before and after the intervention in the studied groups was not significantly different (P > 0.05). (Table 4).

Table 4. Comparing the distribution of the frequency distribution of physical complaints of obsessive-compulsive before and after the intervention in the two studied groups a

Group, Dimension			Intervention	Control	Fishers exact test
Physical complaints (Somatization)	Before intervention	Normal	28 (93.4)	28 (93.4)	X2 = 1.347, P = 1.000
		Mild disorder	1 (3.3)	2 (6.6)	
		Significant disruption	1 (3.3)	0 (0.0)	
	After intervention	Normal	28 (93.4)	27 (90)	X2 = 0.218, P = 1.000
		Mild disorder	2 (6.6)	3 (10)	

Obsessive-compulsive	Before intervention	Normal	15 (50)	15 (50)	X2 = 2.034, P = 0.796
		Mild disorder	13 (43.3)	15 (50)	
		Significant disruption	1 (3.3)	0 (0)	
		severe disorder	1 (3.3)	0 (0)	
	After intervention	Normal	19 (63.3)	18 (60)	X2 = 0.071, P = 1.000
		Mild disorder	11 (36.7)	12 (40)	
Sensitivity in interpersonal relationships, (Interpersonal sensibility)	Before intervention	Normal	17 (56.7)	19 (63.3)	X2 = 1.764, P = 0.581,
		Mild disorder	11 (36.7)	11 (36.7)	
		Significant disruption	2 (6.7)	0 (0.0)	
	After intervention	Normal	25 (83.3)	17 (56.7)	X2 = 9.429, P = 0.004
		Mild disorder	3 (10)	13 (43.3)	
		Significant disruption	2 (6.7)	0 (0)	
Depression	Before intervention	Normal	22 (73.3)	18 (60)	X2 = 3.976, P = 0.102
		Mild disorder	6 (20)	12 (40)	
		Serious disorder	2 (6.7)	0 (0)	
	After intervention	Normal	26 (86.7)	18 (60)	X2 = 10.356, P = 0.003
		Mild disorder	2 (6.7)	125 (40)	
		Significant disruption	2 (6.7)	0 (0)	
Anxiety	Before intervention	Normal	27 (90)	28 (93.3)	X2 = 2.058, P = 0.612
		Mild disorder	1 (3.3)	2 (6.7)	
		Significant disruption	2 (6.7)	0 (0)	
	After intervention	Normal	28 (93.3)	29 (96.7)	X2 = 0.357, P = 1.000
		Mild disorder	2 (6.7)	1 (3.3)	
Aggression (Anger-hostility)	**Before intervention**	**Normal**	**22 (73.2)**	**27 (90)**	**X2 = 3.097, P = 0.216**
		Mild disorder	**6 (20)**	**3 (10)**	
		Significant disruption	**2 (6.7)**	**0 (0)**	
	After intervention	**Normal**	**26 (86.7)**	**29 (96.7)**	**X2 = 2.201, P = 0.418**
		Mild disorder	**2 (6.7)**	**1 (3.3)**	
		Significant disruption	**2 (6.7)**	**0 (0)**	
Fear (Phobic-anxiety)	**Before intervention**	**Normal**	**25 (83.3)**	**28 (93.3)**	**X2 = 2.061, P = 0.506**
		Mild disorder	**3 (10)**	**2 (6.7)**	
		Significant disruption	**2 (6.7)**	**0 (0)**	
	After intervention	**Normal**	**26 (86.7)**	**28 (93.3)**	**X2 = 1.825, P = 0.548**
		Mild disorder	**2 (6.7)**	**1 (6.7)**	
		Significant disruption	**2 (7.9)**	**0 (0)**	
Paranoid ideation	**Before intervention**	**Normal**	**9 (30)**	**18 (60)**	**X2 = 5.873, P = 0.050**
		Mild disorder	**17 (56.7)**	**11 (36.7)**	
		Significant disruption	**4 (13.3)**	**1 (3.3)**	
	After intervention	**Normal**	**17 (56.7)**	**18 (60)**	**X2 = 1.725, P = 0.635**
		Mild disorder	**11 (36.7)**	**12 (40)**	
		Significant disruption	**2 (6.7)**	**0 (0)**	
Psychoticism	**Before intervention**	**Normal**	**25 (83.3)**	**29 (96.7)**	**X2 = 2.878, P = 0.195**
		Mild disorder	**4 (13.3)**	**1 (3.3)**	
		Significant disruption	**1 (3.3)**	**0 (0)**	
	After intervention	**Normal**	**28 (93.3)**	**29 (96.7)**	**X2 = 2.580, P = 0.492**
		Mild disorder	**2 (6.7)**	**1 (3.3)**	

normal, Mild disorder, Significant disruption, severe disorder, Serious disorder

[a] Values are presented as No. (%).

Before intervention, no significant difference in the frequency distribution of different levels of sensitivity in interpersonal relationships in the studied groups was shown ($P > 0.05$); however, after intervention, different levels of sensitivity in interpersonal relationships were significantly different between the groups.

The frequency distribution of students with degrees of depression did not differ significantly between groups before intervention ($P > 0.05$). However, following the intervention, the intervention group had a significantly higher level ($P < 0.05$).

5. Discussion

Study results showed that after the intervention, the average scores of the dimensions of physical complaints, obsessive compulsiveness, interpersonal relationships, depression, anxiety, aggression, fear, paranoid and psychotic in the intervention group, and the average scores of dimensions of obsessive-compulsive disorder, depression, anxiety, and aggression in the control group decreased significantly ($P < 0.05$).

In addition, after intervention with different levels of interpersonal relationship sensitivity, the two groups showed a significant difference ($P < 0.05$). In contrast, the intervention led to a significant increase in the frequency distribution of individuals with depression degrees in the control group ($P < 0.05$).

In agreement with our study, Narimani et al. (23), Dijkstra et al. (24), Tejad Gelardo et al. (25), and Anuri et al. (26) showed a significant decrease in mental health scores vs. the study beginning ($P < 0.05$. Also, Kordani et al. found that the average anxiety score after the intervention in the nurses decreased significantly (27).

Dincer et al. reported that educational intervention improved the state of nurses' mental health by reducing stress, anxiety, and job burnout during the coronavirus pandemic, which was in agreement with our findings (28). According to Xu et al., the intervention significantly improved mental health and its dimensions in healthcare workers through the SCL90 questionnaire (29).

Similar to Hamsour, Lerardi et al. in 2021 found that after the intervention, the average score of depression, interpersonal sensitivity, anxiety, and obsessive-compulsive dimensions in the studied students decreased significantly (30).

In addition to the hard work and the stressful nature of health workers' jobs, the chances of contracting COVID-19 infection are higher (6). The mental and psychological conditions of health workers are more affected by the absence of adequate personal protection facilities due to the fact that many people infected with COVID-19 are symptomatic (6, 9, 31-36)

Mental health outcomes impact health workers' work performance, and specialized mental health services are necessary to address this (32, 37, 38). It is important to prioritize the mental well-being of health workers involved in the COVID-19 response (6).

According to global studies, psychological support is necessary to enhance resiliency against negative mental health outcomes (38-41). Therefore, governments should consider stress management courses as one of the preventive measures (6).

According to the review conducted by Farzani et al., therapists around the world used various psychological interventions such as cognitive behavioural therapy, especially online, emotional release techniques, mindfulness, emotion regulation techniques, and neurofeedback to treat the mentioned psychological injuries (42). By managing anxiety, medical students at the university can improve their hardiness and self-efficacy to handle various life challenges (43). An issue that should be considered is the difference in background conditions (individual, social, cultural and economic). Also, many people's reluctance to express their psychological problems and problems has affected their responses (18).

In general, the increase in anxiety and public concern following the pandemic of infectious diseases, especially the unknown genital infection, leads to a disturbance in the understanding of disease-related issues and other psycho-social challenges, including social stigma and discrimination, which require more attention (44, 45).

People experienced a high level of fear and anxiety due to the Coronavirus pandemic and lack of definitive treatment. On the other hand, this point should be mentioned even though the Coronavirus disease is a deadly disease with a very high prevalence. For several years, the pandemic imposed many economic, social and psychological consequences on the people.

5.1. Strengths and Limitations

This study's strength is its implementation of an interventional study for high-risk groups in the COVID-19 crisis period. The Coronavirus pandemic has led to the study's main limitations, which include the inability to provide complete and appropriate access to the students studied and the study's focus on medical students.

5.2. Conclusions

Stress management training improves the mental health of medical students during a crisis by decreasing anxiety and depression in them. Improving mental health and reducing anxiety in health workers and medical students during critical situations like COVID-19 can be obtained through stress management training as an effective intervention.

Authors' Contribution:

Conceptualization: Sobhan Abbasi, Yahya Mohammadi, Mohammadreza Raeisoon; Formal analysis: Yahya Mohammadi, Mohammadreza Raeisoon; Data curation: Sobhan Abbasi, Yahya Mohammadi; Project administration: Mohammadreza Raeisoon; Original draft writing: all authors; Review writing and editing: all authors.

Conflict of Interests:

There is no competition.

Data Reproducibility:

Data requests can be made to the corresponding author.

Ethical Approval:

Birjand University of Medical Sciences ethics committee approved this study (IR.BUMS.REC.1400.236, https://ethics.research.ac.ir/ProposalCertificateEn.php?id = 229864). Furthermore, all participants in the study were given informed consent.

Funding/Support:

It was not declared by the authors. This study has no funding support.

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