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Original article

The Relationship between Mental Distress and Perception of COVID-19 Stress in Healthcare Students

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SUMMARY

Introduction/Aim: Healthcare students are among the groups affected by the COVID-19 pandemic in various ways. This study aimed to investigate the relationship between mental distress and perceptions of COVID-19 stress in healthcare students.

Methods: The present analytical cross-sectional study included all students of Saveh University of Medical Sciences in 2021 as the statistical population. Through convenience sampling, 419 students were included in the study. A 12-item general health questionnaire (GHQ-12) and a 19-item the COVID-19 related healthcare students stress scale were used to collect data. Data analysis was performed using SPSS and descriptive and analytical statistical methods methods (Pearson correlation coefficient, paired t-test and analysis of variance).

Results: The mean score of students' mental health status was 12.91, and 41.05% (N = 172) of them had some degree of mental distress. There was a significant relationship between mental distress score with the perception of COVID-19 stress, gender and field of study (P < 0.05).

Conclusion: A significant number of students had some degree of mental distress, which had a direct and significant correlation with the perception of COVID-19 stress. Therefore, planning to identify and reduce the stressors associated with COVID-19 is one of the most beneficial actions for the students in restoring their mental health.

Keywords: **mental health, COVID-19 stress, healthcare students, distress**

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INTRODUCTION

The heavy shadow of the corona pandemic has been affecting all aspects of human life for months, becoming one of the most important and major health problems in the world, and the international community is concerned about this disease and its consequences (1, 2). The prevalence of COVID-19 disease in all countries of the world has endangered the health of individuals. Moreover, psychological problems associated with this disease are increasing rapidly in addition to physical problems (3, 4). The World Health Organization has also expressed concerns about the psychological and social effects of this disease (5). COVID-19 has caused a great deal of stress and concern in communities and there is ample evidence of the disturbing effects of this epidemic on human mental health at various levels of society (6, 7). Stress arises when people face pressures and events that they cannot cope with and find them threatening for their own mental and physical health (8). Students have also been affected by the epidemic due to disruptions in the education system and experienced various tensions associated with COVID 19. The closure of universities has been one of the first and most basic actions to prevent the widespread spread of COVID-19 disease in most countries. The closure of universities and changes in teaching methods can affect the physical and mental health of students (9). Studies on the effects of the outbreak of COVID-19 in students have shown high levels of anxiety and stress in students due to the changes in daily life, disruption of educational processes, problems with education or virtual tests, and limitations in social and educational communication (10, 11) . The results of a study in China showed that 42.9% of students have mental distress during the COVID-19 epidemic (12). The cumulative effects of stress and professional challenges can lead to detrimental effects on mental health (13). Mental health is one of the important and influential variables on function. Moreover, disorders in students' mental health as an important obstacle to their success in academic achievement can affect their motivation, concentration, learning, and social interactions (14). Students of any society are usually considered the future makers of that society, therefore paying attention to the dimensions of their mental health also has a great impact on the mental health of the whole society (15). Diagnosis of mental disorders and their effective factors is especially important among students because mental distress hinders academic success and achievement (16). Thus, to have healthy, creative, and capable human resources, the health of these students must be taken into account from now on.

Naturally, education in the health care sciences, which deals in some way with the health and lives of human beings, is a stressful experience. In addition to the general stresses of university life, healthcare students also experience their own special stressful situations such as the psychological pressures of the hospital environment, dealing with patients' problems and observing their suffering (17 - 19). Therefore, the type and level of stress in healthcare students are different compared to non-healthcare students, and most of healthcare students experience even higher levels of stress (20). On the other hand, the stress associated with education in healthcare students during the epidemic of infectious diseases, including the COVID-19 pandemic, is even greater. The previous researches indicated that medical students experience higher levels of anxiety during their clinical internships in the COVID-19 pandemic (21). Healthcare students are highly vulnerable during the epidemic. A continuous use of personal protective equipment makes it difficult to focus on work and decision making. Physical fatigue, emotional exhaustion, and fear of contamination of oneself and relatives cause more anxiety and stress. This physical, mental, and emotional stress can be so high and even trigger mild to severe mental distress (22,23). The results of a study in Turkey showed that 71.5% of nursing students had mental distress during the COVID-19 pandemic (24).

Several studies have been performed on mental health issues during the COVID-19 period. Most of them have focused on health care personnel, patients, children, and the general population (25 - 27). Except for a few cases, there is scarce evidence of the psychological effects of the COVID-19 epidemic on students as a vulnerable community. In this regard, the present study aimed to determine the prevalence of mental distress in healthcare students and explain the related factors considering the lack of any study on mental health and its relationship with COVID-19 stress in healthcare students, and also the need to pay more attention to medical students during the corona pandemic. The findings of the study can help to develop or modify the theoretical and empirical perspectives of the perceived mental health and stress variables related to COVID-19.

METHODS

The present analytical cross-sectional study was conducted in 2021 on 419 medical students (at least one semester) of Saveh University of Medical Sciences, which were selected through a convenience sampling method. Data were collected using a three-part structured questionnaire. The first part included questions about student demographic variables such as age, gender, semester, and place of residence. The General Health Questionnaire (GHQ) was used to assess the mental health status. GHQ is one of the most well-known screening tools for mental distress with a significant impact on the development of behavioral science and psychiatric researches. This questionnaire was first developed by Goldberg in 1972. It is widely used to measure minor psychological distress. The original form of this questionnaire included 60 items and shorter forms included 12, 20, 28, 30, and 44 items (28). In the present study, the 12-item form of this questionnaire was used. In a study in Iran, to test reliability the internal consistency was assessed and showed a satisfactory result (Cronbach's alpha coefficient = 0.87). it was found that the GHQ-12 questionnaire is a reliable and valid questionnare for assessing psychological well-being among the Iranian population.

Montazeri et al. have translated (forward-backward translation method) this questionnaire into Persian and evaluated its validity and reliability. Cronbach's alpha level of the Persian version was acceptable (α = 0.87) (29). This questionnaire describes the aspects of anxiety, depression, and social performance. There are six positive and six negative questions that are scored using a four-point scale (less than usual = 0, no more than usual=1, rather more than usual = 2, or much more than usual=3). Therefore, the scores of the questionnaire vary from 0 (favorable condition) to 36 (unfavorable condition). A higher score indicates a worse mental health condition. A cut-off point above 14.5 was considered a mental disorder (29). In the present study, the content validity method was used for the validity and the internal consistency method and Cronbach's alpha calculation (r = 0.82) were used for reliability.

The COVID-19 healthcare students stress scale (CHSSS) was used for COVID-19 stress (30). This 17 item scale is specially designed for healthcare students. This scale has five factors: fear of catching coronavirus (5 items), social constraints (4 items), changes in education (3 items), non-compliance of health protocols (3 items), worrying news and information overload (2 items). This tool is a five-point Likert scale from zero ("Not at all stressful") to four ("Extremely stressful"). The score ranges from 0 to 68. A low score indicates lower stress and a higher score indicates higher stress. For assessing scale validity, content validity was used and the content validity ratio (CVR) and content validity index (CVI) were calculated. Cronbach's alpha was 0.91 and the intra-class correlation coefficient of the whole tool was 0.85 indicating the appropriate reliability of the scale. The questionnaire was presented electronically to healthcare students of Saveh University of Medical Sciences. Necessary explanations about the objectives of the research and how to complete the questionnaires were provided to the students. The eligible students participated completely voluntarily in the research. SPSS software and descriptive and analytical tests (Pearson correlation coefficient, paired t-test, and analysis of variance) were used to analyze the data.

RESULTS

A total of 419 students participated in the study. The age range of students was 19 - 39 years with a mean age of 20.55 ± 2.98 years. Additional demographic information is given in Table 1.

According to Table 1, the highest score on mental distress was observed in nursing, anesthesia, and midwifery students. One-way analysis of variance and Tukey's showed that the mean scores of mental health were significantly different according to the field of study ($p < 0.05$). The pairwise comparing of the means indicated that the mean score of mental distress in nursing, anesthesia, operating room technology, prehospital emergency care, and midwifery students was significantly different from the other students ($p < 0.05$). However, the mean score of the mental distress in students in nursing, anesthesia, operating room technology, prehospital emergency care, and midwifery was not statistically significant ($p > 0.05$). Also, the mean score of mental distress of public health, health information technology, environmental health, and occupational health students was not statistically significant ($p > 0.05$).

Independent t-test showed that the mean score of mental distress in female students was higher than in male ones, which was statistically significant ($p < 0.05$). There was no statistically signif-

Table 1. *Mean score of mental health status according to demographic characteristics of medical students*

Demographics	Elements	Frequency (%)	Mean (SD) of GHQ-12	P value
Field of study	Nursing	83 (19.8%)	13.3± 11.11	0.01
	Anesthesia	57 (38.25%)	13.21 ±10.07	
	Operation room technology	66 (15.75%)	13.18 ±9.56	
	Prehospital emergency care	39 (9.3%)	12.99 ±8.99	
	Midwifery	38 (9.07%)	13.19± 12.07	
	Public health	38 (9.07%)	12.31± 11.78	
	Health information technology	31 (7.39%)	12.29 ±10.69	
	Environmental health	33 (7.87)	12.31 ±12.01	
	Occupational health	34 (8.11%)	12.04 ±9.84	
Gender	M	164 (39.20%)	11.54 ±10.05	0.01
	F	255 (60.79%)	13.79 ±11.92	
Academic year	1	73 (17.42%)	12.98 ±9.66	0.46
	2	114 (27.2%)	12.92 ±10.01	
	3	137 (32.69%)	12.89 ±9.82	
	4	95 (22.67%)	12.87 ±9.79	

Table 2. *Correlation coefficient between mental distress score and CHSSS factors in healthcare students*

CHSSS factors	GHQ-12 score	
	Correlation coefficient	P value
Fear of catching coronavirus	0.29	<0.01
Social constraints	0.09	0.47
Changes in education	0.26	<0.01
Non-compliance of health protocols	0.08	0.51
Worrying news and information overload	0.17	<0.05
Total	0.21	<0.01

icant relationship between the score of mental distress and the academic year ($p > 0.05$).

Pearson correlation coefficient test was used to examine the correlation between mental distress and the CHSSS factors. It is worth mentioning that high and low scores in the GHQ-12 indicate the existence and absence of a disorder in mental health, respectively.

There was a significant positive correlation between the mental distress score with the score of fear of catching coronavirus, changes in education, and worrying news and information overload. This means that by increasing the scores in these three fields, the score of mental distress also increased ($P < 0.05$). There was no statistically significant relationship between other factors of the CHSSS with the mental distress score (Table 2).

DISCUSSION

Studies on the effects of the COVID-19 pandemic on the mental health of different population groups are increasing. The results of the present study showed that a significant number of students (41.05%) had mental distress during the COVID-19 pandemic. Moreover, mental distress was directly related to the increased perception of COVID-19 stress. The mental health status of students including healthcare students was considered by researchers like Göl and Erkin (24). They evaluated the mental health status of nursing students using a 12-item general health questionnaire (GHQ-12) in Turkey. Their results showed that 71.5% of nursing students had mental distress during the COVID-19 pandemic (24). Another study on healthcare students in Japan found that 28.5% of healthcare students had a mental distress during the COVID-19 pandemic. Kessler Psychological Distress tool was used in this study (31). The reasons for the differences in the results are the inequality of the assessment tools, different field of study, as well as the different contextual conditions under study. In a meta-analysis study conducted between 1991 and 2014 in Iran, the overall prevalence of mental disorders in Iranian students was 33.2% (32). Comparing the number of cases of suspected mental distress in the present study (41.05%) with studies before the COVID-19 pandemic, it seems that the mental health status of students has has become worse than in the past. However, the statistical population differences, ethnic and cultural dispersion, and contextual conditions are also involved in the reported differences. Other factors related to mental health have been also examined along with the mental health variable. For example, in a study conducted during the COVID-19 pandemic in China, it was found that 0.9% of the students experienced severe anxiety symptoms, 2.7% had moderate anxiety symptoms, and 21.3% had mild anxiety symptoms (11). However, the studies in China were conducted at a time when COVID-19 disease was controlled very quickly.

In the present study, it was found that the rate of mental distress in female students was higher than in males. Consistent with the results of the present study, Jafari et al. found that the rate of mental distress in female students was significantly higher than in males (15). Women are thought to be more stressed because they are more emotional (33). The results of the present study showed that the rate of mental distress of students in the academic majors requiring clinical presence was higher compared to other students. During the COVID-19 pandemic, despite the closure of the university, it was necessary for some healthcare students to attend practical and internship courses in hospitals and clinical centers. On the other hand, the results showed that there was a positive and significant correlation between the score of mental distress with CHSSS factors (fear of catching coronavirus, changes in education, worrying news and information overload). Therefore, considering the significant direct correlation between the scores of mental distress and COVID-19 stress, the high scores of GHQ-12 (mental distress) in the present study showed the negative effect of the COVID-19 pandemic on students' mental health. Consistent with the results of the present study, previous researches indicated that during the COVID-19 epidemic, healthcare students spending their internships in hospitals were at higher risk of catching the coronavirus because they were in environments infected with the COVID-19 virus. This leads to the increased stress and anxiety of healthcare students compared to other students (34). On the other hand, many healthcare students were afraid of becoming infected with the COVID-19 virus in the hospital and transmitting the COVID-19 virus to their families and relatives as an asymptomatic vector (31). In studies in China, the students' contact with people infected with COVID-19 disease was also a risk factor for the increased anxiety (11). Furthermore, other changes at universities, including e-learning problems, online exams, and possible delays in the educational process also affected COVID-19 healthcare students stress level. They were also associated with the students' mental distress.

In addition to these short-term effects, studies on the SARS epidemic revealed that psychological effects are not always short-term and can lead to severe and permanent psychological problems such as post-traumatic stress disorder (PTSD) (35).

Conducting studies on mental health status, valuable information in the fields of educational planning, treatment and prevention of mental disorders can be provided to managers and planners. Given the unexpected longer duration and severity of the outbreak of COVID-19 disease, students' concerns need to be further understood and solutions should be found and implemented to reduce these problems. There are several ways to maintain and promote the students' mental health. Some methods

such as preparing booklets containing information about the psychological effects of the COVID-19 pandemic and counseling and psychotherapy services have been effective in reducing the psychological disordes of health care staff (36). Therefore, the implementation of such programs is also recommended for students. It is suggested to pay more attention to the issue of stress and crisis management in the curriculum of healthcare disciplines during the pandemic. Thus, they will be able to face and cope with the stressful conditions of the pandemic with individual and professional preparation.

As the perceived stress of COVID-19 was associated with mental distress, it can be stated that the stresses associated with COVID-19 disease played an important role in the development of mental distress in healthcare students. Accordingly, the managers' planning to identify and reduce the stressors associated with COVID-19 disease in healthcare students can play an important role in promoting students' mental health. Moreover, addressing the factors reducing the psychological distress of medical students is necessary and important. Therefore, along with managing the COVID-19 treatment, an important part of the efforts of education and health managers should be focused on preventing and treating the negative effects of COVID-19 disease stress on healthcare students, especially students engaged with patients.

The present study also had some limitations as follows: statistical population of this study involved students of Saveh University of Medical Sciences. Therefore, generalization of results with other universities should be performed cautiously. This was an analytical cross-sectional study to determine the relationship (not cause and reason) of the variables. Another limitation of this study was that the GHQ is a screening tool for mental disorders and not clinically diagnostic. It is suggested that research be conducted in other universities with different statistical populations and other factors related to students' mental health be examined. We hope that this study will provide the necessary basis for educational, management, and support programs for healthcare students more consciously and accurately.

CONCLUSION

A significant number of students (41.05%) had some degree of mental distress, which had a direct and significant correlation by the perception of COVID-19 stress. In this critical situation of COVID-19 disease, maintaining the mental health of students as future employees is essential for managers' planning. Therefore, planning to identify and reduce the stressors associated with COVID-19 is one of the most beneficial actions for the students in restoring their mental health.

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Ethics approval

This study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board and the Ethics Com-mittee of Saveh University of Medical Sciences, Saveh, Iran (approval code: IR.SavehUMS.REC.1399.022). All participants were informed about the study objectives, their freedom to participate in or withdraw from the investigation.

Conflicts of Interests

There are no conflicts of interest.

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Odnos između mentalnog distresa i percepcije stresa izazvanog kovidom 19 kod studenata zdravstvene nege

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SAŽETAK

Uvod/Cilj. Studenti zdravstvene nege pripadaju grupama koje su pogođene pandemijom virusa kovida 19 na različite načine. Cilj ove studije bilo je ispitivanje odnosa između mentalnog distresa i percepcije stresa izazvanog kovidom 19 kod studenata zdravstvene nege.
Metode. Ova analitička studija preseka uključila je studente Univerziteta medicinskih nauka u Savehu 2021. godine. Pomoću metode "prigodnog" uzorkovanja, 419 studenata je uključeno u studiju. Za prikupljanje podataka korišćeni su upitnik o opštem zdravlju sačinjen od 12 stavki (GHQ-12), kao i skala o evidenciji stresa kod studenata zdravstvene nege od 19 stavki. Analiza podataka urađena je u programu SPSS i pomoću deskriptivnih i analitičko-statističkih metoda (Pirsonov koeficijent korelacije, upareni t-test i analiza varijanse).
Rezultati. Srednja vrednost skora statusa mentalnog zdravlja studenata iznosila 12,91, dok je kod 41,05 % (N = 172) ispitanika zabeležen određeni nivo mentalnog distresa. Zabeležen je značajan odnos između skora mentalnog distresa i percepcije stresa izazvanog kovidom 19, pola i polja istraživanja ($p < 0,05$).
Zaključak. Kod značajnog broja studenata zabeležen je određeni nivo mentalnog distresa, koji je bio u direktnoj i znaćajnoj korelaciji sa percepcijom stresa izazvanim kovidom 19. Stoga je planiranje radi identifikacije i smanjenja stresora udruženih sa kovidom 19 jedna od najblagotvornijih akcija kod uspostavljanja mentalnog zdravlja studenata.

Ključne reči: **mentalno zdravlje, stres izazvan kovidom 19, distres**