Psychosocial Responses To The Outbreak of COVID-19 Infectious Disease Among Health Care Staff in a Referral Hospital in South of Iran

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Research Article

Keywords: COVID-19, Coping Skill, Mental Health, Anxiety, Depression

Posted Date: August 17th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-741596/v1>

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Abstract

Background: COVID-19 pandemic has been one of the most stressful situations, worldwide in the twenty first century, and healthcare providers, at the frontline of this crisis, have been exposed to high viral loads through their patients. Therefore, in addition to being at risk of contracting the virus they have also been under mental distress. In this study, we assessed how the healthcare providers in Shohadaye-Khalije-Fars hospital, located in Bushehr, Iran, psychosocially reacted to this outbreak and what were their coping mechanisms.

Methods: This is a descriptive cross-sectional study which was conducted between March and July 2020. The population were 177 of the providers and staffs in infectious disease and general medicine wards which were selected via simple random sampling method. The online survey was carried out using GHQ-28 mental health and COPE coping skills questionnaires.

Results showed that the mean score of mental health symptoms in female participants (mean=28.65 and standard deviation=12.71) were higher than in male participants (mean=23.97 and standard deviation=10.073), which was statistically significant. Using Chi-square test, there was an outstanding correlation between coping methods and gender. The majority of female participants made use of emotional coping mechanisms (70 out of 113 women) while male participants employed problem-oriented techniques (36 out of 64 men). The results of Pearson's correlation coefficient test revealed that emotion focused and avoidance oriented coping skills were significantly associated with the incidence of mental health illnesses and presentation of anxiety symptoms.

Conclusion: The utilization of emotion-oriented and avoidant-oriented coping skills by the healthcare providers and ward staffs aggravated their anxiety symptoms and increased mental health problems in this population during the COVID-19 pandemic. On that account, offering workshops and trainings in regards with coping skills will improve their ability to understand their emotions, detect signs of anxiety early and learn how to manage them in unpredictable stressful situations.

Introduction

Coronavirus 2019 (COVID-19) was firstly reported in China in later 2019, but is not the first of these zoonotic viruses that has rapidly spread in the world. The first common coronavirus was Severe acute respiratory syndrome (SARS-CoV) in 2003 followed by Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012. It has had moderate to severe psychological impact on more than half of the general population. Adding that World Health Organisation (WHO) considered health care providers at higher risk of developing mental and physical problems as a result of being in direct and indirect contact of COVID-19 patients. Being in the frontline of managing patients with high viral loads, especially in areas where there is shortage of optimal personal protective equipment, they are more prone to contract and transmit the disease. In such situation, elements like stress, emotional burden, long working hours, concerns of contracting the infection and contaminating others, lack of definite and effective treatment in

early stages of pandemic, and poor mental health support from employers, would affect the health status of medical staffs and providers (1).

COVID-19 disease can deeply stress and frustrate medical staffs making them feel helpless and carry the fear of being discriminated at workplace. During the first outbreak of deadly Ebola virus in 1976, large number of health care providers contracted the virus and those who survived the disease reported high level of Post-Traumatic Stress Disorder (PTSD). Unfortunately, the work-related health issues and the risk of developing them in health care providers have not been well studied yet. Since the outbreak of SARS-CoV, many researches have been performed in that regards, but psychological effects of infectious disease on medical personal, is not an area that has been well-researched. Some studies have reported that anxiety and depression symptoms can last even beyond the outbreaks which confirms the long-term psychological consequences of such situations (2).

Some researchers have identified that an acute accident caused by a biological disaster as one of the major threats to the sanity of mental health which could be the background of why the majority of healthcare providers suffered psychological distress during the COVID-19 pandemic. A study on 441 medical staffs in a Polish hospital reported that 64.4% developed anxiety symptoms, 70.7% depression, and 58% had insomnia. Furthermore, another study which assessed 1422 healthcare workers in Spain, showed that 58.6% developed anxiety symptoms from which 20.7% were severe, 46% depression, and 5.3% demonstrated depressive disorders. In addition, a significant proportion of medical staffs in China experienced symptoms of depression (25.2%-58%), anxiety (29.28%-54.2%), and insomnia (34%-36.1%) during the recent pandemic (3, 4).

Stress is an emotional experience associated with biochemical, psychological, and behavioral changes and is the result of irrational, extreme and negative processing of circumstances. These can lead to disruption in behavior and capability to cope. Environmental stressors can to some extent, motivate, stimulate, and empower people; but when they are beyond their endurances, stress appears (5).

Nursing is one the most difficult and stressful occupations as it involves encountering with the pain, suffering, and death of human beings in addition to supporting the survivors. Alongside of being at risk of work hazards like contracting deadly transmissible diseases, and needle sticking. In situations like current pandemic where nurses were obliged to work longer hours and more intense shifts; fatigue and exhaustion added to the original risk which could jeopardize their quality of work despite their tiresome efforts. All these, could increase the likelihood of burnout syndrome. These unprecedented psychological and emotional pressures were the main reasons of diminished motivation, interest in work, and feeling emotionally numb. Therefore, the importance of the employees' mental health, especially their coping skills as one the effective and basic components of it, must be taken seriously. These skills in addition to the efforts people make, either emotionally or behaviorally, prepare them to face the stress more effectively (6).

Coping skills and the ability of controlling emotions are amongst the numerous psychological factors that can affect the mental health of medical staffs. Coping can be described in its different components

like strategies, tactics, responses, cognition or behaviors. Moreover, it is a mediating technique to reduce the stress in negative life events. Lazarus and Folkman (1984) defined it as a set of cognitive and behavioral efforts to overcome both external and internal pressures encountered by an individual which are beyond their capability to conquer. In other words, coping is a process through which people try to control the problems caused by stress and negative excitement (3).

In dealing with stressful situations, the coping behaviors that people establish are either effective or ineffective. Problem-focused coping technique is among those that are effective which is active and based on planning, and tolerance. Emotion-focused coping methods are considered effective too and require the search for helpful social support which includes all the acts and thoughts that a person employs to control and improve the unpleasant feelings caused by stressful circumstances, and can be based on acceptance, seeking emotional support, and positive interpretation. It also can be built on seeking religious, emotional, and moral resolutions, in addition to praying, sympathy and empathy, comprehending the situation and being understood by others, taking an optimistic attitude and acceptance of the fact that the stressful events might not change which can lead people towards the positive thinking, change and adaptation (7).

However, dysfunctional coping with painful emotions through wishful thinking is the use of medication to escape the suffering, negative thinking, impulsive behaviors, and lack of mental, and behavioral engagement. This coping skill is described as denial (8). Also, extrovert or sociable individuals who are in denial can disrupt others by expressing their anxious feelings and aggravate others' state of stress and confusion under taxing environmental conditions (9). Coping is a mixture of thoughts, behaviors, and personal characteristics such as self-esteem (a sense of mastery of the situation), cognitive skills, being in control, self-efficacy, and problem-solving ability; that exist before the stress occurs and can be made use of when encountering stressful situations (10). Inefficient coping skills can remove the manpower of the specialized health providers in hospitals and degrade their productivity, proactivity, and appropriate psychological response to work stress and the reduced performance. This reveals the importance of examining the process of coping strategies that would have a significant effect on stress and mental health status. Based on various studies performed in controllable situations, problem-focused coping methods are more effective, but emotion-focused coping skills are more appropriate in uncontrollable situations such as grief (11).

Therefore, evaluating the existing conditions can be used to enhance adaptation and stress management. This can be employed in educational planning of medical staffs to learn emotion recognition skills and how to be in control in non-critical situations. Therefore, research on mental health status and coping skills of employees is necessary in order to plan to improve their behavior and response in similar circumstances in future. The main purpose of this study was to determine the relationship between psychosocial responses and coping skills of medical staff with the prevalence of COVID-19 in the Shohadaye-Khalije-Fars Hospital in Bushehr, south of Iran

Methods

This descriptive cross-sectional study was performed to determine psychosocial responses and coping skills related to the outbreak of COVID-19 virus in hospital staff. The sample size was calculated as 165 people according to the type of research (descriptive), error reduction, and representativeness of community members, which considered approximately 180 people with 10% loss. The sample size was extracted with the following formula:

$$n = \frac{N \times Z_{\alpha}^2 \times \sigma^2}{\varepsilon^2 (N-1) + Z_{\alpha}^2 \times \sigma^2}$$

Where the accuracy is $\varepsilon = 0.1$, the standard deviation is $\sigma = 0.75$, $N = 1100$ and the test error level is $\alpha = 0.05$.

Shohadaye-Khalije-Fars Hospital is an educational and medical hospital affiliated to Bushehr University of Medical Sciences (BPUMS) that from the beginning of the epidemic, *it* was considered as the reference hospital of COVID-19 and received all critically ill patients who needed possible hospitalization in the intensive care unit from all over the province. The 1100 hospital staffs (N) consist of 660 clinical, 258 administrative-support, and 182 paramedics.

The sampling method was systematic random sampling and the sample members were selected after extracting the list of personnel numbers. If informant consent was accepted, online and through mass communication software, electronic questionnaires sent once during courier time. Ultimately, 177 people completed the questionnaire. Data collection tools in this study were anonymous demographic questionnaires, GHQ-28 mental health questionnaires, and COPE (Cope Operations Preference Inquiry) coping skills.

The GHQ-28 questionnaire is a valid tool for assessing psychosocial responses and general mental health, presented by Goldberg and Hiller (1979) with four subscales of physical symptoms, anxiety and sleep disorders, social function, and depression. The validity and reliability of this questionnaire were confirmed in a previous study (2001). In addition, the reliability coefficient of the whole questionnaire in the retest method was 0.72 and for the subtests physical symptoms, anxiety and insomnia, social dysfunction, and depression, was significant. The reliability coefficient for the whole scale was 0.93 (23).

The Carroo et al.'s (1989) Preference for Prevention Exercise Questionnaire was designed as a two-factor value measuring problem-oriented, emotion-oriented, and less useful values. Jalali Nejad et al. standardized this questionnaire in Iran and identified 5 practices in which cognitive- approach is a subdomain of problem-focused coping skill, cognitive-approach and emotional-approach are subdomains of emotional-focused coping skill, and cognitive-avoidance and behavioral-avoidance are subdomains of avoidance coping skill (7).

To analyze the data, descriptive statistics (frequency, percentage, mean, standard deviation, and standard error of data) and inferential statistics (Pearson correlation test, t-test for independent groups, chi-square

test, and One-way variance) were applied using spss-22 software. This study was conducted with the design number 1570 obtained from Bushehr University of Medical Sciences and Health Services with the ethics code IR.BPUMS.REC.1399.002.

Results

Demographic characteristics

The demographics of the respondents are described in Table 1. Out of 177 respondents, 85 (48%) were clinical (5 doctors, 80 nurses, and midwives), 61 (34.5%) were administrative-support, 11 (6.2%) were paramedics, and 20 (11.3%) were security personnel. The mean (standard deviation) age of the participants of this study was 36.09 years old (8.476). The majority were female (113 [63.8%]) aged between 26 and 50 years old (157 [92.4%]), married, widowed or divorced (126 [71.2%]), educated, undergraduate or less (149 [84.2%]). A total of 136 participants (76.8%) were frontline health care workers who were working directly in the ward or in close contact with COVID-19 patients for the past month. Most of the participants did shift work (113 [63.8%]). Moreover, most of the participants (176 [99.4 %]) were not working in other hospitals in the province of Bushehr. 50 participants (28.2%) developed symptoms of COVID-19 disease due to hospital exposure or patient care. The type of employment of 91 (51.4%) participants was permanent, contractual or casual (Table 1).

Table 1
Demographic characteristics of study participants

variable	Subgroup	Number	Percent
Gender	Male	64	36.2
	Female	113	63.8
marital status	Unmarried	51	28.8
	Married	123	69.5
	divorced	2	1.1
	widowed	1	0.6
Level of Education	High school	8	4.5
	Diploma	17	9.6
	Associate Degree	18	10.2
	Master degree	106	59.9
	Masters	20	11.3
	Doctorate	8	4.5
Age	20–29	48	28.2
	30–39	63	37.1
	40–49	46	27.1
	50–59	13	7.6
Shift work	Fixed in the morning	47	26.6
	Morning and evening	16	9
	Evening and night	1	0.6
	Shifts in circulation	113	63.8
Service unit	Clinical	85	48
	Para-clinic	11	6.2
	Office-Support	61	34.5
	Service-protection	20	11.3
type of employment	Official	68	38.4
	conventional	12	6.8
	Quasi-agreement	11	6.2

variable	Subgroup	Number	Percent
	Company	9	5.1
	Design	37	20.9
	Contractual	37	20.9
	Committed to service (soldier)	1	0.6
	Student	2	1.1

Mental health index scores and the associated factors

The median range in GHQ-28 for mental health was 26.0 (33.0–18.0). Medium (intermediate range) in each one of the subscales of Physical Symptoms, Anxiety Symptoms and Sleep Disorders, Social Function, and Depressive Symptoms was 7.0 (11.0–4.0), 5.0 (10.0–3.0), 8.0 (12.0–7.0), and 2.0, respectively. The most symptoms were sub-social and the least symptoms were related to depression subscale. 40.1% of the participants had no or minimal symptoms of mental illness and 46.3% of them had mild symptoms. Table 2 shows the severity of physical symptoms, anxiety symptoms and sleep disorders, social functioning and depressive symptoms, and morbid symptoms in general. Regarding total mental health status, 40.1% of the participants had no or minimal symptoms of mental illness and 46.3% of them had mild symptoms.

Table 2

Severity of physical symptoms, anxiety symptoms and sleep disorders, social functioning, depressive symptoms, and morbid symptoms in general in hospital staff

	None	Mild	medium	Severe
	person (percentage)	person (percentage)	person (percentage)	person (percentage)
Physical symptoms	80 (45.2)	53 (29.9)	32 (18.1)	12 (6.8)
Anxiety symptoms and sleep disorders	97 (54.8)	41 (23.2)	30 (16.9)	9 (5.1)
Symptoms of social functioning	30 (16.9)	101 (57.1)	38 (21.5)	8 (4.5)
Symptoms of depression	151 (85.3)	20 (11.3)	4 (2.3)	2 (1.1)
Symptoms in general	71 (40.1)	82 (46.3)	22 (12.5)	2 (1.1)

The mean score of mental health in women (mean = 28.65 and standard deviation = 12.71) was higher than men (mean = 23.97 and standard deviation = 10.073), which was statistically significant (p-value =

0.008, $t(156.3) = -2.699$). Additionally, the mean scores of the Anxiety Symptoms subscale in women (mean = 7.76 and standard deviation = 5.56) were statistically significantly higher than men (mean = 5.28 and standard deviation = 4.52) (p-value = 0.002, $t(153.6) = -3.218$). In the subscale of physical symptoms, the scores of women (mean = 8.66 and standard deviation = 5.36) were higher than men (mean = 6.77 and standard deviation = 4.36), which were statistically significant (p-value = 0.017, $t(175) = -2.414$).

The difference between the mean scores of total mental health (p-value = 0.006, $t(96.6) = 2.793$) and the scores of anxiety symptoms (p-value = 0.003, $t(93.1) = 3.032$) between the two groups who were either in close contact with the COVID-19 patients or were not, was significant. The mean scores were higher in those participants who had interaction with the patients. In addition, between mean mental health scores (p-value = 0.000, $t(175) = 5.547$) and scores of subscales of physical symptoms (p-value = 0.000, $t(175) = 9.81$), anxiety symptoms (p-value = 0.001, $t(175) = 3.273$) of those who developed or had no symptoms of COVID-19 due to hospitalization or patient care, were also significantly different at the level of 0.05. Using one-way analysis of variance, it was observed that the mean score of social symptoms in different work shifts had a significant mean difference at the level of 0.05 ($F(2,173) = 6.399$; p-value = 0.002). Schaffer post hoc test showed that there is a significant difference between the score of social symptoms of fixed morning shifts and morning and evening shifts (p-value = 0.005), as well as between morning and evening shifts and rotating shifts (p-value = 0.003). The highest mean score was 12.44 in the morning and evening shifts and the lowest average was 8.85 belonged to the morning shifts.

There was no statistically significant difference among educational level, service unit, and age and mental health, different coping skills (problem-focused, emotion-focused, and avoidance) and accompanying factors. In confrontational preference, 75 (42.4%) of the participants used problem-based coping skill, 92 (52.0%) used emotion-based, and 10 (5.6%) were avoidant. The most significant one used by women was emotional coping skill (70 out of 113 women) and in men, it was problem-focused skill (36 out of 64 men) $\chi^2(2) = 12.994$. p-value = 0.002, which is in line with other studies (12).

There was no significant relationship among educational level, marital status, service unit, work experience, shift work, type of employment, COVID-19 symptoms, and place of service in close contact with COVID-19 patients and coping skills.

The relationship between mental health and coping skills

According to the results of Pearson correlation test, there was a statistically significant correlation between mental health score and avoidance coping skill ($r = 0.186$. P-value = 0.013). Higher mental health scores were found to be more associated with the avoidance skill. There was a statistically significant correlation between mental health score and emotion-focused coping skill ($r = 0.182$. P-value = 0.015). Besides, higher mental health scores were indicated to be more associated with more emotion-focused coping skill preferences. There was a direct relationship between the severity of anxiety symptoms and

avoidant coping skill ($r = 0.190$. $P\text{-value} = 0.011$). Moreover, there was a direct relationship between the intensity of anxiety symptoms and emotion-focused coping skill ($r = 0.184$. $P\text{-value} = 0.014$).

Discussion

According to previous studies, the vast majority of health care personnel in the COVID-19 Pandemic have suffered from psychological trauma. More than half of ordinary people rated the psychological impact of the outbreak as moderate to severe. However, the World Health Organization has identified health care personnel at a higher risk for a wide range of mental and physical problems resulted from caring for COVID-19 patients directly or indirectly. Healthcare personnel, being at the frontline of working with COVID-19 patients, are at risk of exposure to high viral loads, and lack of optimal protective equipment increases the risk of transmission of the virus. At the same time, severe stress, high emotional load, long working hours, worriedness about being infected or contaminating others, insufficient support in workplace, and inadequacy of effective supportive therapies can deteriorate their health status (1).

In recent years, the causes of stress and coping techniques have been widely studied and shown that utilizing effective coping methods plays an important role in reducing stress and affecting the health. Due to the fact that medical personnel are exposed to a variety of stressors for a long time, it is important to understand the nature of coping strategies used in these situations as well as their efficiency in diminishing stress. Indeed, effective management of acute stress levels can reduce the risk of long-term depressive and anxiety disorders like PTSD (12).

According to the results of the Mental Health Questionnaire, 40.1% of the participants had no or minimal symptoms, 46.3% of them had mild symptoms, 12.4% had moderate symptoms, and 1.1% developed severe symptoms of mental illnesses. The highest mean was related to the subscale of social symptoms and the lowest mean belonged to depressive symptoms. Additionally, according to the results of the Coping Preference Questionnaire, 42.4% of the participants established problem-based coping skills, 52% emotion-based, and 5.6% of them indicated avoidance.

In other studies, we found that health care workers in the COVID-19 emergency department experience enormous amount of stress at work environment due to the pressure imposed by teamwork and illness, as they are forced to intervene with inadequate tools and resources, which affects the health institution. Furthermore, along with increasing levels of arousal, they have experienced profound emotional reactions caused by anger, helplessness, and frustration with inevitable cognitive stress (13, 14). Some researchers suggested that an important public health issue could be considered as an acute accident from a biological disaster. Therefore, it can lead to a high prevalence of mental illness.

Most of the staffs working at the COVID-19 pandemic suffered from psychological damage. In our study, 45.1% of the staffs had anxiety symptoms, 14.7% of them had depressive symptoms, 54.8% of them had physical symptoms, 5.1% of them had severe anxiety symptoms, and 1.1% had severe depressive symptoms. Among 441 Polish personnel, 64.4%, 70.7%, and 58.0% showed symptoms of anxiety,

depression, and insomnia, respectively (15). Among 1422 Spanish health personnel, 58.6% had anxiety, 46% depression, 20.7% severe anxiety, and 5.3% showed depressive disorder (16).

An analysis of 14 studies published from January to March 2020 investigated the experience of stress in health care workers. It was shown that workers exposed to COVID-19 experienced symptoms of depression and related anxiety. In addition, the stressful experience of the severity of their symptoms was affected by age, sex, role, type of specialty, activity performed, and their exposure to COVID-19 patients. However, prevention, resilience, and social support interventions mediated their response to stress (17). In a study by Lai et al., sleep was reported as related to more than 70% of psychological distress.

A survey of Chinese health care workers during the COVID-19 pandemic found that 36.1% of them (564 out of 1563) had some type of insomnia (18). A significant proportion of Chinese healthcare workers reported symptoms of depression (25.2% – 58%), anxiety (29.18% – 54.2%), and insomnia (34.0% – 36.1%) during the COVID-19 pandemic (4). In general, the depressive symptoms reported in our study seem to be less than similar studies, but the anxiety symptoms were slightly lower than those reported in other studies.

It is important to consider the gender variable in the mental health status of employees. According to other studies, women were more likely than men to respond to physical and emotional stressors and feel inefficient in decision-making process (19–21). In fact, women perceive events as more negative and uncontrollable; therefore, they suffer more stress. In addition, women tend to focus on emotion-focused coping skills, which are less effective in emergencies (22–24). In this study, due to the significant difference in women's mental health scores compared to men, it was found that female hospital staffs experienced more stress during the COVID-19 disease pandemic. Notably, there was a significant difference in scores, especially in the subscales of anxiety and physical symptoms; and therefore, this epidemic had a greater effect on the level of anxiety and physical problems of female hospital staffs. As reported by a study conducted at the University of Urbino in Italy, a significant difference was observed between men and women in terms of anxiety, emotional anxiety, and stress (12, 24).

According to the results of this study, those who were in close contact with the COVID-19 patients as well as those who developed symptoms due to patient care, had lower levels of mental health but higher levels of anxiety. This result has also been repeated in some other studies (12, 17). Using one-way analysis of variance, it was also observed that those who worked in the morning and evening shifts had more social dysfunction. The score of social symptoms of this group had a significant difference compared to the scores of rotational shift workers and those worked in the morning shifts. In addition, the study by Walton et al. (2020) identified institutional stressors such as changes in shift work, prevalence of night shifts, workload and established role of employees, autonomy, and lack of upstream support (14). In addition, in the Sasangohar's study, limited resources, longer shifts, reduced rest hours, and occupational hazards were found to be associated with COVID-19 exposure because these factors increased the physical and mental fatigue, stress, anxiety, and burnout of employees (13).

Using Chi-square test, a significant relationship was observed between coping style and gender. Accordingly, in women the most used skill of coping was emotion-focused and in men was problem-focused.

According to the results of Pearson correlation test, mental health had a positive significant correlation with emotion-focused and avoidance coping skills, which is consistent with similar studies in China in this field (25). This indicates that the more one uses an emotion-based or avoidance strategy, the less mental health status one will have. Those who adopt avoidance coping skills are at higher risk of mental health stress as supported by several other researches (26–28). In addition, health care workers immersed in emotion-focused coping strategies are usually suffering from higher emotional burnout, stress, anxiety, depression, and PTSD (26).

Sub-scales also showed a significant positive correlation between anxiety symptoms, emotion-focused, and avoidance skills; indicating that the use of emotion-focused and avoidance techniques is associated with the increased anxiety levels. Moreover, a positive significant correlation was observed between social symptoms and problem-based skill, and a negative significant correlation was found between depression and problem-based skill. Correspondingly, this suggests that using a problem-focused skill increases social dysfunction, but reduces depression. Studies showed that front-line health care workers with children have higher rates of anxiety, depression, and distress. This may lead to avoidance and absenteeism coping strategies in workplace, which negatively affects the performance of an organization (26, 29).

The results show that emotion-focused and avoidance coping skills are significantly associated with mental illness and anxiety symptoms. As a result of holding coping training classes, hospital staffs can improve recognizing their emotions and learn how to control them, which is effective in identifying avoidance and emotion-focused coping skills, and create their adaptation and stress management. During COVID-19 pandemic, it is essential to meet the needs of health care workers, provide them with timely psychological support, and pay attention to their mental health, especially the at-risk groups. On the other side, the fact that hospital staffs were working three shifts, were fatigued, and had rotational shift works, made it difficult for them to participate in the study.

Several limitations was in the study. First, due to cross-sectional design, the causal conclusions cannot establish. Second, we conducted this study in a COVID-19 reference hospital, thus health care workers in this hospital were more likely to experience stress than those in other provenience hospitals. Therefore, research on physicians from community hospitals should be undertaken in the future. Third, all data were self-reported, which can introduce information bias.

Conclusion

The utilization of emotion-oriented and avoidant-oriented coping skills by the healthcare providers and ward staffs aggravated their anxiety symptoms and increased mental health problems in this population during the COVID-19 pandemic. On that account, offering workshops and trainings in regards with coping

skills will improve their ability to understand their emotions, detect signs of anxiety early and learn how to manage them in unpredictable stressful situations.

Declarations

Acknowledgements

We would like to thank the Department of Management of Nursing Services, the Clinical Research Development Center of the Shohadaye-Khalije-Fars Hospital, Bushehr, Iran and the Vice Chancellor for Research of Bushehr University of Medical Sciences for their financial cooperation and implementation of this research.

Authors' contribution

J.K. and A.S. conceived of the presented idea. B.A., N.S. and S.D. developed the theory and performed the computations. E.J. and M.M. verified the analytical methods. S.B and B.A. wrote and revised the manuscript. B.D. carried out the implementation and data collection. A.S. and J.K. supervised the findings of this work. All authors read and approved the final manuscript.

Funding

None received

Availability of data and materials

Data are available by request

Ethics approval and consent to participate

The protocol of the study was approved by the regional Biomedical research ethics committee of Bushehr University of Medical Sciences on 5 April 2020, Approval ID: IR.BPUMS.REC.1399.002. The informed consent agreements of this online survey was verified by the click-if-you-agree type of online form. and the ethics committee approved this procedure for consenting to participate. The informed consent was accepted by all of the participants.

Competing interests

There are no financial and non-financial competing interests.

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Tables

Table 1: Demographic characteristics of study participants

variable	Subgroup	Number	Percent
Gender	Male	64	36.2
	Female	113	63.8
marital status	Unmarried	51	28.8
	Married	123	69.5
	divorced	2	1.1
	widowed	1	0.6
Level of Education	High school	8	4.5
	Diploma	17	9.6
	Associate Degree	18	10.2
	Master degree	106	59.9
	Masters	20	11.3
	Doctorate	8	4.5
Age	20-29	48	28.2
	30-39	63	37.1
	40-49	46	27.1
	50-59	13	7.6
Shift work	Fixed in the morning	47	26.6
	Morning and evening	16	9
	Evening and night	1	0.6
	Shifts in circulation	113	63.8
Service unit	Clinical	85	48
	Para-clinic	11	6.2
	Office-Support	61	34.5
	Service-protection	20	11.3
type of employment	Official	68	38.4
	conventional	12	6.8
	Quasi-agreement	11	6.2
	Company	9	5.1

Design	37	20.9
Contractual	37	20.9
Committed to service (soldier)	1	0.6
Student	2	1.1

Table 2: Severity of physical symptoms, anxiety symptoms and sleep disorders, social functioning, depressive symptoms, and morbid symptoms in general in hospital staff

	None	Mild	medium	Severe
	person (percentage)	person (percentage)	person (percentage)	person (percentage)
Physical symptoms	80 (45.2)	53 (29.9)	32 (18.1)	12 (6.8)
Anxiety symptoms and sleep disorders	97 (54.8)	41 (23.2)	30 (16.9)	9 (5.1)
Symptoms of social functioning	30 (16.9)	101 (57.1)	38 (21.5)	8 (4.5)
Symptoms of depression	151 (85.3)	20 (11.3)	4 (2.3)	2 (1.1)
Symptoms in general	71 (40.1)	82 (46.3)	22 (12.5)	2 (1.1)