Research Paper

The Relationship of Cognitive Flexibility and Self-compassion With Depression and Anxiety Among Healthcare Staff During the COVID-19 Pandemic

Ashkan Babaei[1], Fereshte Momeni[1*], Mohsen Vahedi[2], Mohammadreza Davoudi[2]

1. Department of Clinical Psychology, Psychosis Research Center, School of Behavioral Sciences,University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
2. Department of Biostatistics and Epidemiology, Psychosis Research Center, School of Rehabilitation Sciences, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.

Use your device to scan and read the article online

Citation Babaei A, Momeni F, Vahedi M, Davoudi M. The Relationship of Cognitive Flexibility and Self-compassion With Depression and Anxiety Among Healthcare Staff During the COVID-19 Pandemic. Iranian Rehabilitation Journal. 2023; 21(1):39-48. http://dx.doi.org/10.32598/irj.21.1.69.4

http://dx.doi.org/10.32598/irj.21.1.69.4

Article info:
Received: 08 Apr 2021
Accepted: 23 Nov 2022
Available Online: 01 Mar 2023

Keywords:
COVID-19, Depression, Anxiety, Self-compassion, Cognition

ABSTRACT

Objectives: The COVID-19 outbreak has considerably affected various aspects of our lives and different groups of society. In this regard, healthcare staff is more affected by the pressure of heavy workloads and daily exposure to suspected COVID-19 cases. This study aimed to investigate depression and anxiety as two basic factors of mental health among healthcare workers and the role of self-compassion and cognitive flexibility during the pandemic.

Methods: A multi-center cross-sectional study was conducted. Healthcare workers were the target group, and the samples were collected through the online groups from healthcare staff of coronavirus hospitalized centers in Tehran. A convenience sampling method was used in this study. The general anxiety disorder-7 scale, patient health questionnaire, cognitive flexibility inventory, and self-compassion short-form scale were used online for data collection. Totally 551 respondents were entered into the analysis process of the current study.

Results: A total of 437 respondents (79.3%) had mild to severe anxiety symptoms, and 447(81.1%) had mild to severe depressive symptoms. Cognitive flexibility had a significant negative relationship with anxiety and depression (r=-0.40, r=-0.37, respectively, P<0.001). Similarly, the relationship between self-compassion and anxiety and depression was significantly negative (r=-0.48, r=-0. 47, respectively, P<0.001).

Discussion: This study demonstrates the positive effects of cognitive flexibility and self-compassion on healthcare staff during COVID-19.

*** Corresponding Author:**
Fereshte Momeni, Assistant Professor.
Address: *Department of Clinical Psychology, Psychosis Research Center, School of Behavioral Sciences, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.*
Tel: *+98 (21) 22180083*
E-mail: *momenipsy@gmail.com*

Highlights

• Many healthcare workers suffer from anxiety and depression because of the COVID-19 pandemic.

• People who lost someone because of COVID-19 and those with a chronic illness background are at more risk for anxiety and depression.

• Cognitive flexibility and self-compassion reduce the severity of anxiety and depression.

Plain Language Summary

In this article, we report on the role of cognitive flexibility and self-compassion in the mental health of medical staff. This topic is important because of the COVID-19 pandemic, high levels of anxiety, stress, and depression have already been observed in healthcare professionals who stand on the frontline of this crisis. Therefore, immediate interventions are essential to enhance psychological resilience for people who work under extreme pressure due to the COVID-19 pandemic. Our study proposes that self-compassion and cognitive flexibility are two factors that can significantly strengthen the psychological capacity to expose difficult and long-lasting situations like the COVID-19 pandemic. We hope that this work can be beneficial for further interventions to enhance psychological resilience.

1. Introduction

The COVID-19 pandemic, which was first identified in Wuhan, China, in December 2019, has become a serious global threat [1]. As of March 02, 2021, A total of 113820168 cases and 2527891 deaths have been reported worldwide [2]. In Iran, the first confirmed case of COVID-19 was proclaimed on February 19, 2020 [3]. The Government of Iran declared a state of emergency and ordered a nationwide quarantine during the national holidays, which lasted two weeks. Removal of re-strictions after the holiday leads to the second wave and extensive spread of COVID-19. As of March 2, 2021, A total of 1639679 cases and 60181 deaths have been confirmed in Iran [3].

Many research studies show that healthcare staff has been impacted by COVID-19 psychologically; a screening study in New York indicates acute stress, depression, anxiety, and mod-erate insomnia symptoms among the healthcare workforce [4]. Also, research conducted in China shows a high prevalence of stress, anxiety, and depression in healthcare workers [5]. A review study showed a significant degree of stress, anxiety, depression, and insomnia among healthcare workers [6]. In addition, some studies show that healthcare staff experiences higher levels of mental problems such as insomnia, hopelessness, anxiety, depression, somatization, and obsessive-compulsive symptoms [7-9]. Although some studies assessed mental health among the general population in Iran, information about the healthcare workforce is limited [10, 11]. Regarding the heavy workload on healthcare staff during this exceptional circumstance and the high risk of infection due to exposure to suspected or confirmed patients of COVID-19, examining the psychological status of the healthcare workforce would be especially necessary. Furthermore, understanding the psychological factors which play significant roles in mental health could be crucial and useful for further interventions.

Based on the research, higher cognitive flexibility and self-compassion are negatively associated with emotional distress [12]. Cognitive flexibility has been defined as the capacity to shift between thinking about two independent concepts or to think about various ideas simultaneously; also, it can define as the ability to adapt behaviors in response to changes in the environment [13, 14]. Some research demonstrates that psychological flexibility is negatively related to somatization, depression, anxiety, and general psychological distress [15]. Accord-ing to a study in the UK, during the pandemic, psychological flexibility is positively associated with wellbeing and inversely with distress, including anxiety, depression, and COVID-19 distress [16]. Similarly, a study conducted in the USA indicated that higher openness to experience and behavioral awareness is inversely related to general and peritraumatic distress [17].

Self-compassion has been defined as being temperate and understanding when we suffer, fail, or feel inadequate, rather than ignoring our illness or afflicting ourselves with self-judgment and criticism [18]. Kristin

Neff [18] considered self-compassion to be composed of three principal parts: Self-kindness, common humanity, and mindfulness. Some findings show self-compassion is negatively related to depression, anxiety, and rumination [19, 20]. Correspondingly, a meta-analysis study indicates that self-compassion is an influential factor for well-being, decreasing anxiety and depression, and increasing resilience to stress [21]. In addition, the findings demonstrate that self-compassion is a more powerful predictor of de-pression, anxiety, and quality of life (QoL) than mindfulness [22]. According to research, self-compassion mediates the negative relation between mental health and psychopathology and a role as a protective function [23].

The interest in cognitive flexibility and self-compassion is rapidly increasing. More research suggests investigating the impact they have on mental status. Based on the studies men-tioned, cognitive flexibility and self-compassion are two factors related to human capacity in exposure to difficult and unexpected situations. Accordingly, we focused on evaluating the prevalence of depression and anxiety among the healthcare staff and the role of self-compassion and cognitive flexibility in mental status. Although studies examine the effect of the COVID-19 outbreak on various groups' mental problems, our knowledge, especially on mental aspects that may be beneficial for better coping during the outbreak, is insufficient. Addi-tionally, more studies on the healthcare workforce's mental situation in Iran are needed, and current information is limited. Therefore, we are optimistic that our study findings can pro-vide useful information for further interventions on healthcare staff's mental health.

2. Materials and Methods

Design and registration

Multi-center cross-sectional studies through an internet-based test were conducted from August 22 to September 22, 2020, and the samples were collected via convenience sampling. Based on the Cochran formula for an unknown population, the sample size with a 95% confidence level was calculated, and the result showed that 385 in our target population should be enough to give us the confidence levels we needed. We used Porsline, an Iranian research website, to design an internet-based survey. Most hospitals and medical science departments in Iran use WhatsApp or Telegram platforms. Accordingly, this survey was sent on the internet to those who were willing to participate in the study through these platforms, and all interest-ed healthcare staff clicked the relevant link.

A total of 551 members participated in the study: 32 of them were medical interns, others were healthcare staff, and most of them were nurses. All respondents were informed that their information would keep confidential.

Demographic information

The questionnaire included the 10 demographic following items, including age, gender, marital status, educational level, occupation, and any background of chronic illness. In addition, the respondents were asked if they ever received psychotherapeutic help, if COVID-19 infected them, if they knew someone who passed away because of COVID-19 infection, and whether they felt a change in their psychological status during the pandemic.

Assessment of anxiety symptoms

The General Anxiety Disorder-7 Scale (GAD-7) was used to evaluate the prevalence of anxiety symptoms among healthcare staff. GAD-7 was developed by Robert L. Spitzer [24]. The scale consists of 7 items to detect probable cases and severity of GAD over the past two weeks. The reliability of original and Persian forms are described as excellent (Cronbach α=0.92) [24] and good (Cronbach α=0.85) [25], respectively. Participants were asked to respond regarding the COVID-19 outbreak and its consequential effects. Response options included "not at all", "several days", "more than half the day", and "nearly every day". Overall scores for the seven items range from 0 to 21. Points 5, 10, and 15 were considered cutoff points for mild, moderate, and severe anxiety, respectively.

Assessment of depressive symptoms

The patient health questionnaire-9(PHQ-9) was used to monitor the severity of depression among healthcare staff over the past two weeks. The questionnaire was developed by Robert L. Spitzer [26]. The reliability of the questionnaire in English form was described as excellent (Cronbach α=0.89) [27], and the Persian form was described as good (Cronbach α=0.85) [28]. Participants were asked to respond regarding the COVID-19 outbreak and its consequential effects questionnaire is a 9-item depression module from the full PHQ. Response options included "not at all", "several days", "more than half the day", and "nearly every day". Points 5, 10, 15, and 20 indicate mild, moderate, moderately severe, and severe depression, respectively.

Cognitive flexibility inventory

The cognitive flexibility inventory was developed by Dennis and Vander Wal [29]. The inventory is a self-report measure that assesses three features of cognitive flexibility: The propensity to understand difficult situations as controllable, the capacity to consider various alternative explanations for incidents and human actions, and the ability to create multiple alternative solutions to demanding conditions [29]. The reliability of the original form is described as good to excellent (Cronbach α=0.90 to 0.91) [29], and the Persian form revealed good reliability as well (Cronbach α=0.90) [30]. The inventory consists of 20 items, and each response option ranged from strongly disagree=1 to strongly agree=7. The higher scores are related to greater cognitive flexibility, and lower scores indicate great cognitive rigidity.

Self-compassion scale

The self-compassion short form scale has 12 items developed by Filip Raes et al. in 2011 which measures 6 components of self-compassion: Self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identified [31]. The reliability of English and Persian forms are described as excellent (Cronbach α=0.86) [31] and acceptable (Cronbach α=0.79) [32], respectively. Response options include a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always). Greater scores represent higher self-compassion. Since subscale scores are less reliable with the short form and based on developers' suggestions, subscale scores were not considered in our analysis [31].

Statistical analysis

The data were analyzed with SPSS software, version 22. Descriptive statistics were used to indicate demographic features and the prevalence of anxiety and depression in the healthcare population. Independent samples t-test and one-way ANOVA were performed to compare the averages of two independent groups with normal distribution. In addition, a bivariate correlation was used to determine the relationship between factors and linear regression analysis to measure the risk of anxiety and depression. P<0.05 were accepted as statistically significant.

3. Results

Participants' characteristics

Of 551 participants, 406 (73.8%) were females, 143 (26.2%) were males, and 5 were unidentified. The Mean±SD age of the respondents was 35.22±9.074 years. The participants were 184 nurses, 101 physicians, and 47 midwives. Considering the participants' responses, 85(15.4%) were infected by COVID-19, confirmed by laboratory tests, 152(27.6%) just had signs of infection, and 309(56.1%) had no signs of infection, and there were 5 missing data. Also, 438(79.8%) claimed they felt a change in their psychological status, 92(16.7%) reported they had lost a person because of COVID-19 infection, 109(19.8%) had a chronic illness, and 130(23.6%) received psychotherapeutic help. The Mean±SD values of anxiety, depression, cognitive flexibility, and self-compassion were 8.48±5.03, 10.14±6.08, 96.63±16.20, and 36.22±7.31, respectively

Prevalence of anxiety

According to the results, 78 participants (14.2%) experienced severe anxiety (scored 15-21), 111(20.1%) moderate anxiety (scored 10-14), 248(45%) mild anxiety (scored 5-9), and 114(20.7%) no significant anxiety (scored 0-4).

Prevalence of depression

Fifty participants (9.1%) experienced severe depression (scored 20-27), 86(15.6%) moderately severe depression (scored 15-19), 124(22.5%) moderate depression (scored 10-14), 187(33.9%) mild depression (scored 5-9), and 104(18.9%) no significant depression (scored 0-4).

Anxiety, depression, cognitive flexibility, and self-compassion in terms of demographic information

Respondents who answered "yes" to the question :"Have you experienced any change in your psychological status since the beginning of the pandemic?" showed significantly higher anxiety and depression and lowered cognitive flexibility and self-compassion (P<0.05, Table 1). There was a statistically significant difference in cognitive flexibility and self-compassion by gender, but no difference was observed in anxiety and depression (P<0.05, Table 1). The anxiety level was significantly higher in three groups: Married participants, respondents who knew someone that passed away because of COVID-19 infection, and respondents with chronic illness (P<0.05, Table 1). There was a significant difference in the m anxiety, depression, and self-compassion in the participants with a background of psychotherapy (P<0.05, Table 1), and the level of self-compassion was significantly lower in respondents with chronic illness background (P<0.05, Table 1).

Table 1. The demographic information

Demographic Information	Group	No. (%)	Anxiety		Depression		Cognitive Flexibility		Self-compassion	
			Mean±SD	P	Mean±SD	P	Mean±SD	P	Mean±SD	P
Gender (n=546, missing=5)	Female Male	403(73.8) 143(26.2)	8.7±4.9 7.8±5.1	0.075	10.3±6 9.6±6.3	0.197	95.7±16.1 99±16.5	0.036	35.4±7.1 38.3±7.4	<0.001
Marital status (n=534, missing=17)	Married Single	333(62.4) 201(37.6)	8.8±5 7.8±4.9	0.031	10.1±6 10.1±6	0.977	95.8±16.3 97.6±16	0.207	36.2±7.4 36±7.2	0.795
Educational level (n=548, missing=3)	Internship Bachelor Master PhD	37(6.8) 317(57.8) 70(12.8) 124(22.6)	8.2±5.5 8.3±5 9.2±4.8 8.6±5	0.607	9.8±6.4 9.9±6 11±5.9 10.1±6.2	0.615	94.1±13.5 95.9±16.4 97.3±15.7 98.7±16.6	0.293	35.8±7.3 36.4±6.9 36.6±7.8 35.4±7.7	0.558
Healthcare profession (n=551, missing=0)	Nurse Physician Midwife Intern Others (paramedic, Anesthesiologist, dietitian, etc.)	184(33.4) 101(18.3) 47(8.6) 32(5.8) 187(33.9)	8.8±5.3 8.2±4.4 8.7±5.1 8.4±5.8 8.1±4.7	0.701	10.7±6.4 9.5±5.8 10±5.8 10.4±6.6 9.8±5.8	0.538	95.5±17.5 98.6±15.7 93.6±15 98.2±16.1 97.1±15.4	0.385	36.6±7.4 35.6±7.2 34.4±6.7 35.1±7.5 36.6±7.3	0.235
Has COVID-19 infected you? (n=546, missing=5)	1- Yes, I tested positive for covid-19 2- I had the symptoms, but I did not-test 3- No, I had no symptom	85(15.5) 152(27.7) 309(56.3)	9.9±5.5 9.3±5.1 7.6±4.6	Total=0.000 1 and 3=0.001 2 and 3=0.003	12.9±6.6 11.2±6 8.8±5.6	Total=0.000 1 and 3=0.000 2 and 3=0.000	94.8±16.7 94.7±17.1 97.9±15.4	0.089	35.1±7.8 35.2±6.9 37±7.1	0.039
Have you experienced any change in your psychological status since the beginning of the pandemic? (n=549, missing=2)	Yes No	438(79.8) 111(20.2)	9.4±4.8 4.4±3.6	<0.001	11.2±5.9 5.9±4.6	<0.001	95.4±16.1 101.2±15.8	0.001	35.5±7.2 38.7±7.1	<0.001
Have you lost someone to COVID-19? (family members, friends, Colleagues) (n=550, missing=1)	Yes No	92(16.7) 458(83.3)	9.9±5 8.2±4.9	0.003	11.2±6.5 9.9±5.9	0.058	94.6±17.7 97±15.8	0.207	35.2±6.8 36.4±7.4	0.151
Do you have any background in chronic illness? (n=550, missing=1)	Yes No	109(19.8) 441(80.2)	9.3±5.4 8.2±4.8	0.044	11.1±6.5 9.8±5.8	0.051	94.3±16.2 97.2±16.1	0.094	34.5±7.8 36.6±7.1	0.007
Have you ever received psychotherapeutic help? (n=550, missing=1)	Yes No	130(23.6%) 420(76.4%)	9.6±5.5 8.1±4.8	0.003	12.1±6.5 9.5±5.7	<0.001	95.8±17.3 96.9±15.8	0.517	34.4±7.7 36.7±7.1	0.001

Table 2. Results of correlational analysis

Variables	Results	Anxiety	Depression	Self-compassion	Cognitive Flexibility (CF)	CF: Alternatives	CF: Control	CF: Human Alternatives
Anxiety	Pearson correlation	1	0.789**	-0.484**	-0.404**	-0.209**	-0.517**	-0.016
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.713
	n	551	551	551	551	551	551	551
Depression	Pearson correlation	0.789**	1	-0.478**	-0.371**	-0.211**	-0.464**	0.010
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.813
	n	551	551	551	551	551	551	551
Self-compassion	Pearson correlation	-0.484**	-0.478**	1	0.613**	0.416**	0.664**	0.120**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.005
	n	551	551	551	551	551	551	551
Cognitive flexibility (CF)	Pearson correlation	-0.404**	-0.371**	0.613**	1	0.869**	0.822**	0.482**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000	0.000
	n	551	551	551	551	551	551	551
CF: Alternatives	Pearson correlation	-0.209**	-0.211**	0.416**	0.869**	1	0.459**	0.499**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000	0.000
	n	551	551	551	551	551	551	551
CF: Control	Pearson correlation	-0.517**	-0.464**	0.664**	0.822**	0.459**	1	0.107*
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000		0.012
	n	551	551	551	551	551	551	551
CF: Human alternatives	Pearson correlation	-0.016	0.010	0.120**	0.482**	0.499**	0.107*	1
	Sig. (2-tailed)	0.713	0.813	0.005	0.000	0.000	0.012	
	n	551	551	551	551	551	551	551

**Correlation is significant at the 0.01 level (2-tailed).

Iranian Rehabilitation Journal

*Correlation is significant at the 0.05 level (2-tailed).

Correlational analysis

As shown in Table 2, there was a relationship between anxiety, depression, cognitive flexibility, and self-compassion. As one would expect, the association between anxiety and depression based on Cohen guidelines [33] was strongly positive (r=0.78, P<0.001), and there was a large positive correlation between cognitive flexibility and self-compassion (r=0.61, P<0.001). Cognitive flexibility had a moderate negative relationship with anxiety (r=-0.40, P<0.001) and depression (r=-.37, P<0.001). Also, there was a medium negative correlation between self-compassion and anxiety and depression (r=-0.48, r=-0.47, respectively, P<0.001). The assessment of the cognitive flexibility subscale indicates that the control subscale had the most influential correlation with anxiety (r=-0.51, P<0.001) and depression (r=-0.46, P<0.001), and the human alternatives subscale had no significant correlation with anxiety and depression.

Table 3. Levels of anxiety: Linear regression analysis

Variables	B	SE	Beta	t	P
Constant	21.697	0.921		23.570	<0.001
Self-compassion	-0.173	0.033	-0.251	-5.262	<0.001
CF: Control	-0.194	0.026	-0.351	-7.346	<0.001

R=0.550; R^2=0.303; ADJ R^2=0.300; SE=4.21090

Iranian Rehabilitation Journal

Regression analysis

Linear regression analysis could be used to assess the ability of two control measures (cognitive flexibility inventory, self-compassion short form scale) to predict levels of anxiety and depression (GAD-7, PHQ-9). The data of 551 respondents were entered, and the results are shown in Tables 3 and 4. Linear regression analysis (Table 3) demonstrated that self-compassion (β=-0.173; P<0.000) and control (subscale of cognitive flexibility) (β=-0.194; P<0.000) are two factors to reduce anxiety(R^2=0.303, Adjusted R^2=0.300). Similarly, self-compassion (β=-0.253; P<0.000) and control (β=-0.175; P<0.000) had decreasing effect on depression(R^2=0.267, Adjusted R^2=0.264) (Tables 4).

4. Discussion

In this study, the first aim was to examine the prevalence of anxiety and depression among the healthcare staff, and the results showed that 29.9% of respondents significantly experienced both anxiety (scored 10-21) and depression (scored 10-27), 4.4% just experienced anxiety and 17.2% just experienced depression. The findings suggest that being married, losing someone because of COVID-19 infection, having a background of chronic illness, and back receiving psychotherapy may be risk factors, and staff with these features probably needed a higher degree of support and mental protection. It can be argued that married people have more concerns than single people, like fear of infection and transmission to their partner or children. In addition, having a background of chronic illness and receiving psychotherapy can perceive by a person as debilitating factors during infection. It would seem clear that the healthcare workforce who lost someone because of COVID-19 is under considerable pressure than others who did not, and investigating the process of grief among these people can be a subject of a new study. Likely, the pain and problems of patients with COVID-19, observing their death, and the fear of COVID-19 disease can cause feelings of depression and anxiety in healthcare workers. Some studies have shown that the nurse-patient relationship causes psychological symptoms, such as depression in nurses [34], and the feeling of more stress in the workplace and fatigue associated with patient care are the risk factors for anxiety and depression in nurses.

The second aim of the current study was to estimate the role of cognitive flexibility and self-compassion on anxiety and depression during the pandemic. Correlational analysis revealed that self-compassion and the propensity to understand difficult situations as controllable (control subscale) are influential in decreasing anxiety and depression severity. The scores of self-compassion and cognitive flexibility were significantly higher in males than females, as other studies suggested [34, 35]. The findings of this study indicate that self-compassion creates more tolerance, and probably healthcare workforces with higher scores of self-compassion perceive difficult situations as more meaningful and constructive than others; therefore, they act kind and understanding toward themselves and others in comparison with people who perceive the condition catastrophic and harsh, as Gilbert and Irons suggest that self-compassion make inactive the threat system [36]. Based on the findings of this

Table 4. Levels of depression: Linear regression analysis

Variables	B	SE	Beta	t	P
Constant	25.577	1.141		22.426	<0.001
Self-compassion	-0.253	0.041	-0.304	-6.214	<0.001
CF: Control	-0.175	0.033	-0.262	-5.350	<0.001

R=0.516; R^2=0.267; Adjusted R^2=0.264; SE=5.21722

Iranian Rehabilitation Journal

study, one would say that cognitive flexibility helps the healthcare workforce to feel more assertive and powerful against the pandemic because they understand problems as more challenging and controllable compared to people who feel ineffectual.

Regarding research, higher cognitive flexibility scores are associated with cognitive restructuring ability to reduce subjective distress [37]. Therefore, our study proposes that self-compassion and cognitive flexibility are two factors that can strengthen the mind's ability significantly to tolerate difficult and long-lasting situations like the COVID-19 pandemic among the healthcare workforce and reduce the levels of anxiety and depression.

Study limitations

As the data presented here were collected from a cross-sectional design, the study did not provide an inference for causation. To avoid possible infections and the difficulty of attending to hospital, we conducted an online-based survey. Therefore, the possibility of selection bias should be regarded. Most respondents were nurses, and according to a different experience of each job in the health system, the result may be a bias for other healthcare jobs. In addition, we did not assess the mental status of respondents before the outbreak; thus, the results should interpret with caution because it would not be certain determine whether the outbreak just caused the outcomes or not.

5. Conclusion

The object of this study was to focus on a quick assessment of two major factors of mental health (anxiety and depression). Therefore, it would seem that further psychological interventions are required to assess the conditions and other aspects of mental health among healthcare staff in more detail. In addition, more information is needed for providing well-organized treatment for those suffering from anxiety or depression and preventive interventions for staff with subclinical symptoms. During the study, we recognized that many healthcare workforces were experiencing burnout; further investigation into burnout and related factors is strongly recommended.

Ethical Considerations

Compliance with ethical guidelines

All ethical Issues were considered in this article. All participants were informed about the purpose of the study and its stages. They were also confident in the security of their statistics and free to leave the study whenever they want. They knew that the results of the studies can be made public. Informed written consent has been obtained from individuals.

Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

Authors' contributions

Conceptualization, study design, and definition of intellectual content: Fereshte Momeni and Ashkan Babaei; Searching the literature: Ashkan Babaei; Conducting the study procedures and data collection: Fereshte Momeni and Ashkan Babaei; Data analysis: Ashkan Babaei and Mohsen Vahedi; Editing: Mohammadreza Davoudi; Final approval: All authors.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgments

We thank all who participated in our study. Additionally, we express our deep respect to all healthcare staff and their enormous efforts to fight COVID-19.

References

[1] Dong E, Du H, Gardner L. An interactive web-based dashboard to t=rack covid-19 in real time. The Lancet Infectious Diseases. 2020; 20(5):533-4. [DOI:10.1016/S1473-3099(20)30120-1] [PMID]

[2] Gavi. (covid-19) dashboard [Internet]. 2021. [Updated: 8 March 2023]. Available From: [Link]

[3] World Health Organization. Weekly epidemiological update on covid-19-24. Genava: World Health Organization; 2022. [Link]

[4] Shechter A, Diaz F, Moise N, Anstey DE, Ye S, Agarwal S, et al. Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the covid-19 pandemic. General Hospital Psychiatry. 2020; 66:1-8. [DOI:10.1016/j.genhosppsych.2020.06.007] [PMID] [PMCID]

[5] Xiao X, Zhu X, Fu S, Hu Y, Li X, Xiao J. Psychological impact of healthcare workers in China during covid-19 pneumonia epidemic: A multi-center cross-sectional survey investigation. Journal of Affective Disorders. 2020; 274:405-10. [DOI:10.1016/j.jad.2020.05.081] [PMID] [PMCID]

[6] Spoorthy MS, Pratapa SK, Mahant S. Mental health problems faced by healthcare workers due to the covid-19 pandemic-A review. Asian Journal of Psychiatry. 2020; 51:102119. [DOI:10.1016/j.ajp.2020.102119] [PMID] [PMCID]

[7] Zhang WR, Wang K, Yin L, Zhao WF, Xue Q, Peng M, et al. Mental health and psychosocial problems of medical health workers during the covid-19 epidemic in China. Psychotherapy and Psychosomatics. 2020; 89(4):242-50. [DOI:10.1159/000507639] [PMID] [PMCID]

[8] Hacimusalar Y, Kahve AC, Yasar AB, Aydin MS. Anxiety and hopelessness levels in covid-19 pandemic: A comparative study of healthcare professionals and other community sample in Turkey. Journal of Psychiatric Research. 2020; 129:181-8. [DOI:10.1016/j.jpsychires.2020.07.024] [PMID] [PMCID]

[9] Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: A web-based cross-sectional survey. Psychiatry Research. 2020:112954 [DOI:10.1016/j.psychres.2020.112954] [PMID] [PMCID]

[10] Moghanibashi-Mansourieh A. Assessing the anxiety level of Iranian general population during covid-19 outbreak. Asian Journal of Psychiatry. 2020:102076. [DOI:10.1016/j.ajp.2020.102076] [PMID] [PMCID]

[11] Jahanshahi AA, Dinani MM, Madavani AN, Li J, Zhang SX. The distress of Iranian adults during the covid-19 pandemic-more distressed than the Chinese and with different predictors. Brain, Behavior, and Immunity. 2020; 87:124. [DOI:10.1016/j.bbi.2020.04.081] [PMID] [PMCID]

[12] Marshall EJ, Brockman RN. The relationships between psychological flexibility, self-compassion, and emotional wellbeing. Journal of Cognitive Psychotherapy. 2016; 30(1):60-72. [DOI:10.1891/0889-8391.30.1.60] [PMID]

[13] Scott WA. Cognitive complexity and cognitive flexibility. Sociometry. 1962; 405-14. [DOI:10.2307/2785779]

[14] Cañas J, Quesada J, Antolí A, Fajardo I. Cognitive flexibility and adaptability to environmental changes in dynamic complex problem-solving tasks. Ergonomics. 2003; 46(5):482-501. [DOI:10.1080/0014013031000061640] [PMID]

[15] Masuda A, Tully EC. The role of mindfulness and psychological flexibility in somatization, depression, anxiety, and general psychological distress in a nonclinical college sample. Journal of Evidence-Based Complementary & Alternative Medicine. 2012; 17(1):66-71. [DOI:10.1177/2156587211423400]

[16] Dawson DL, Golijani-Moghaddam N. Covid-19: Psychological flexibility, coping, mental health, and wellbeing in the UK during the pandemic. Journal of Contextual Behavioral Science. 2020; 17:126-34. [DOI:10.1016/j.jcbs.2020.07.010] [PMID] [PMCID]

[17] Kroska EB, Roche AI, Adamowicz JL, Stegall MS. Psychological flexibility in the context of covid-19 adversity: Associations with distress. Journal of Contextual Behavioral Science. 2020; 18:28-33. [DOI:10.1016/j.jcbs.2020.07.011] [PMID] [PMCID]

[18] Neff KD, Kirkpatrick KL, Rude SS. Self-compassion and adaptive psychological functioning. Journal of Research in Personality. 2007; 41(1):139-54. [DOI:10.1016/j.jrp.2006.03.004]

[19] Neff KD, Rude SS, Kirkpatrick KL. An examination of self-compassion in relation to positive psychological functioning and personality traits. Journal of Research in Personality. 2007; 41(4):908-16. [DOI:10.1016/j.jrp.2006.08.002]

[20] Krieger T, Altenstein D, Baettig I, Doerig N, Holtforth MG. Self-compassion in depression: Associations with depressive symptoms, rumination, and avoidance in depressed outpatients. Behavior Therapy. 2013; 44(3):501-13. [DOI:10.1016/j.beth.2013.04.004] [PMID]

[21] MacBeth A, Gumley A. Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. Clinical Psychology Review. 2012; 32(6):545-52. [DOI:10.1016/j.cpr.2012.06.003] [PMID]

[22] Van Dam NT, Sheppard SC, Forsyth JP, Earleywine M. Self-compassion is a better predictor than mindfulness of symptom severity and quality of life in mixed anxiety and depression. Journal of Anxiety Disorders. 2011; 25(1):123-30. [DOI:10.1016/j.janxdis.2010.08.011] [PMID]

[23] Trompetter HR, de Kleine E, Bohlmeijer ET. Why does positive mental health buffer against psychopathology? An exploratory study on self-compassion as a resilience mechanism and adaptive emotion regulation strategy. Cognitive Therapy and Research. 2017; 41(3):459-68. [DOI:10.1007/s10608-016-9774-0] [PMID] [PMCID]

[24] Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: The GAD-7. Archives of Internal Medicine. 2006; 166(10):1092-7. [DOI:10.1001/archinte.166.10.1092] [PMID]

[25] Naeinian MR, Shaeiri MR, Sharif M, Hadian M. To study reliability and validity for a brief measure for assessing generalized anxiety disorder (GAD-7). Clinical Psychology and Personality. 2011; 9(1):41-50. [Link]

[26] Spitzer RL, Kroenke K, Williams JB, Patient Health Questionnaire Primary Care Study Group. Validation and utility of a self-report version of PRIME-MD: The PHQ primary care study. JAMA. 1999 282(18):1737-44. [DOI:10.1001/jama.282.18.1737] [PMID]

[27] Kroenke K, Spitzer RL, Williams JB. The PHQ-9: Validity of a brief depression severity measure. Journal of General Internal Medicine. 2001; 16(9):606-13. [DOI:10.1046/j.1525-1497.2001.016009606.x] [PMID] [PMCID]

[28] Maroufizadeh S, Omani-Samani R, Almasi-Hashiani A, Amini P, Sepidarkish M. The reliability and validity of the patient health questionnaire-9 (PHQ-9) and PHQ-2 in patients with infertility. Reproductive Health. 2019; 16(1):137. [DOI:10.1186/s12978-019-0802-x] [PMID] [PMCID]

[29] Dennis JP, Vander Wal JS. The cognitive flexibility inventory: Instrument development and estimates of reliability and validity. Cognitive Therapy and Research. 2010; 34(3):241-53. [DOI:10.1007/s10608-009-9276-4]

[30] Shareh H, Farmani A, Soltani E. Investigating the reliability and validity of the cognitive flexibility inventory (CFI-I) among Iranian University Students. PCP. 2014; 2(1):43-50. [DOI:10.5430/ijelt.v1n2p53]

[31] Raes F, Pommier E, Neff KD, Van Gucht D. Construction and factorial validation of a short form of the self-compassion scale. Clinical Psychology & Psychotherapy. 2011; 18(3):250-5. [DOI:10.1002/cpp.702] [PMID]

[32] Khanjani S, Foroughi AA, Sadghi K, Bahrainian SA. [Psychometric properties of Iranian version of self-compassion scale (short form) (Persian)]. Pajoohandeh Journal. 2016; 21(5):282-9. [Link]

[33] Hemphill JF. Interpreting the magnitudes of correlation coefficients. American Psychologist. 2003; 58(1):78-9. [DOI:10.1037/0003-066X.58.1.78] [PMID]

[34] Yarnell LM, Stafford RE, Neff KD, Reilly ED, Knox MC, Mullarkey M. Meta-analysis of gender differences in self-compassion. Self and Identity. 2015; 14(5):499-520. [DOI:10.1080/15298868.2015.1029966]

[35] Roothman B, Kirsten DK, Wissing MP. Gender differences in aspects of psychological wellbeing. South African Journal of Psychology. 2003; 33(4):212-8. [DOI:10.1177/008124630303300403]

[36] Gilbert P, Irons C. Focused therapies and compassionate mind training for shame and self-attacking. In P. GilbertM editor. Compassion: Conceptualisations, research and use in psychotherapy. Oxfordshire: Routledge; 2005. [Link]

[37] Johnco C, Wuthrich VM, Rapee RM. The influence of cognitive flexibility on treatment outcome and cognitive restructuring skill acquisition during cognitive behavioural treatment for anxiety and depression in older adults: Results of a pilot study. Behaviour Research and Therapy. 2014; 57:55-64. [DOI:10.1016/j.brat.2014.04.005] [PMID]